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ANALYTICAL REPORT

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

Laboratory Job ID: 240-144567-1
Client Project/Site: Ford LTP - Off Site

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

Attn: Kristoffer Hinskey

Authorized for release by:
3/3/2021 10:12:46 AM

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

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

Table of Contents

Definitions/Glossary

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

Job ID: 240-144567-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
S1-	Surrogate recovery exceeds control limits, low biased.
U	Indicates the analyte was analyzed for but not detected.

Glossary

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

Job ID: 240-144567-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144567-1

Comments
No additional comments.

Receipt
The samples were received on 2/17/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.5º C.

GC/MS VOA
Method 8260B: The laboratory control sample (LCS) for analytical batch 240-474305 recovered outside control limits for the following analyte: Tetrachloroethane. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data has been reported: TRIP BLANK (240-144567-1) and (LCS 240-474305/4).

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

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

Method Summary

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

Job ID: 240-144567-1

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

Protocol References:

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

Laboratory References:

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

Sample Summary

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

Job ID: 240-144567-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144567-1	TRIP BLANK	Water	02/15/21 00:00	02/17/21 08:00	
240-144567-3	MW-118S_021521	Water	02/15/21 12:28	02/17/21 08:00	

Detection Summary

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

Job ID: 240-144567-1

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-144567-1

No Detections.

Client Sample ID: MW-118S_021521 — Lab Sample ID: 240-144567-3

No Detections.

This Detection Summary does not include radiochemical test results.

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

Job ID: 240-144567-1

Client Sample ID: TRIP BLANK

Date Collected: 02/15/21 00:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144567-1

Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 21:53	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 21:53	1
Tetrachloroethene	1.0	U *+	1.0	0.15	ug/L			02/24/21 21:53	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 21:53	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 21:53	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 21:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*96*		*75 - 130*		*02/24/21 21:53*	*1*
4-Bromofluorobenzene (Surr)	*62*		*47 - 134*		*02/24/21 21:53*	*1*
Toluene-d8 (Surr)	*80*		*69 - 122*		*02/24/21 21:53*	*1*
Dibromofluoromethane (Surr)	*113*		*78 - 129*		*02/24/21 21:53*	*1*

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

Job ID: 240-144567-1

Client Sample ID: MW-118S_021521

Date Collected: 02/15/21 12:28
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144567-3

Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/24/21 18:36	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*		*02/24/21 18:36*	*1*

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 15:21	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 15:21	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 15:21	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 15:21	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 15:21	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 15:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*89*		*75 - 130*		*02/24/21 15:21*	*1*
4-Bromofluorobenzene (Surr)	*98*		*47 - 134*		*02/24/21 15:21*	*1*
Toluene-d8 (Surr)	*94*		*69 - 122*		*02/24/21 15:21*	*1*
Dibromofluoromethane (Surr)	*88*		*78 - 129*		*02/24/21 15:21*	*1*

Surrogate Summary

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

Job ID: 240-144567-1

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

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

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(75-130)	(47-134)	(69-122)	(78-129)
240-144567-1	TRIP BLANK	96	62	80	113
240-144567-3	MW-118S_021521	89	98	94	88
240-144568-B-3 MS	Matrix Spike	71 S1-	86	92	87
240-144568-D-2 MS	Matrix Spike	87	98	93	89
240-144568-E-2 MSD	Matrix Spike Duplicate	86	100	92	91
240-144568-E-3 MSD	Matrix Spike Duplicate	69 S1-	91	93	88
LCS 240-474305/4	Lab Control Sample	88	87	89	91
LCS 240-474307/4	Lab Control Sample	84	101	92	89
MB 240-474305/7	Method Blank	98	67	84	103
MB 240-474307/7	Method Blank	87	103	92	89

Surrogate Legend

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

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

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

		Percent Surrogate Recovery (Acceptance Limits)
		DCA
Lab Sample ID	Client Sample ID	(70-133)
240-144567-3	MW-118S_021521	86
240-144568-J-2 MS	Matrix Spike	81
240-144568-J-2 MSD	Matrix Spike Duplicate	82
LCS 240-474283/4	Lab Control Sample	84
MB 240-474283/5	Method Blank	86

Surrogate Legend

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

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

Lab Sample ID: MB 240-474305/7
Matrix: Water
Analysis Batch: 474305

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 14:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 14:13	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 14:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 14:13	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 14:13	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 14:13	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*98*		*75 - 130*		*02/24/21 14:13*	*1*
4-Bromofluorobenzene (Surr)	*67*		*47 - 134*		*02/24/21 14:13*	*1*
Toluene-d8 (Surr)	*84*		*69 - 122*		*02/24/21 14:13*	*1*
Dibromofluoromethane (Surr)	*103*		*78 - 129*		*02/24/21 14:13*	*1*

Lab Sample ID: LCS 240-474305/4
Matrix: Water
Analysis Batch: 474305

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	10.8		ug/L		108	73 - 129
cis-1,2-Dichloroethene	10.0	9.69		ug/L		97	75 - 124
Tetrachloroethene	10.0	12.6	*+	ug/L		126	70 - 125
trans-1,2-Dichloroethene	10.0	11.0		ug/L		110	74 - 130
Trichloroethene	10.0	10.3		ug/L		103	71 - 121
Vinyl chloride	10.0	9.04		ug/L		90	61 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*88*		*75 - 130*
4-Bromofluorobenzene (Surr)	*87*		*47 - 134*
Toluene-d8 (Surr)	*89*		*69 - 122*
Dibromofluoromethane (Surr)	*91*		*78 - 129*

Lab Sample ID: 240-144568-B-3 MS
Matrix: Water
Analysis Batch: 474305

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	9.41		ug/L		94	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	8.71		ug/L		87	68 - 121
Tetrachloroethene	1.0	U *+	10.0	11.6		ug/L		116	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	9.81		ug/L		98	69 - 126
Trichloroethene	1.0	U	10.0	9.03		ug/L		90	56 - 124
Vinyl chloride	1.0	U	10.0	8.44		ug/L		84	49 - 136

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*71*	*S1-*	*75 - 130*
4-Bromofluorobenzene (Surr)	*86*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*

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

Lab Sample ID: 240-144568-B-3 MS
Matrix: Water
Analysis Batch: 474305

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

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*87*		*78 - 129*

Lab Sample ID: 240-144568-E-3 MSD
Matrix: Water
Analysis Batch: 474305

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.22		ug/L		92	64 - 132	2	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.56		ug/L		86	68 - 121	2	35
Tetrachloroethene	1.0	U *+	10.0	11.0		ug/L		110	52 - 129	6	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.16		ug/L		92	69 - 126	7	35
Trichloroethene	1.0	U	10.0	8.83		ug/L		88	56 - 124	2	35
Vinyl chloride	1.0	U	10.0	8.72		ug/L		87	49 - 136	3	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*69*	*S1-*	*75 - 130*
4-Bromofluorobenzene (Surr)	*91*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*88*		*78 - 129*

Lab Sample ID: MB 240-474307/7
Matrix: Water
Analysis Batch: 474307

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 14:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/24/21 14:06	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/24/21 14:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/24/21 14:06	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/24/21 14:06	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/24/21 14:06	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*		*02/24/21 14:06*	*1*
4-Bromofluorobenzene (Surr)	*103*		*47 - 134*		*02/24/21 14:06*	*1*
Toluene-d8 (Surr)	*92*		*69 - 122*		*02/24/21 14:06*	*1*
Dibromofluoromethane (Surr)	*89*		*78 - 129*		*02/24/21 14:06*	*1*

Lab Sample ID: LCS 240-474307/4
Matrix: Water
Analysis Batch: 474307

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.71		ug/L		97	73 - 129
cis-1,2-Dichloroethene	10.0	10.6		ug/L		106	75 - 124
Tetrachloroethene	10.0	9.87		ug/L		99	70 - 125
trans-1,2-Dichloroethene	10.0	10.3		ug/L		103	74 - 130
Trichloroethene	10.0	9.93		ug/L		99	71 - 121

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

Lab Sample ID: LCS 240-474307/4
Matrix: Water
Analysis Batch: 474307

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Vinyl chloride			10.0	11.5		ug/L		115	61 - 134		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*84*		*75 - 130*
4-Bromofluorobenzene (Surr)	*101*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Lab Sample ID: 240-144568-D-2 MS
Matrix: Water
Analysis Batch: 474307

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,1-Dichloroethene	1.0	U	10.0	9.77		ug/L		98	64 - 132		
cis-1,2-Dichloroethene	0.43	J	10.0	10.1		ug/L		97	68 - 121		
Tetrachloroethene	1.0	U	10.0	9.57		ug/L		96	52 - 129		
trans-1,2-Dichloroethene	1.0	U	10.0	9.78		ug/L		98	69 - 126		
Trichloroethene	1.0	U	10.0	9.70		ug/L		97	56 - 124		
Vinyl chloride	1.0	U	10.0	11.4		ug/L		114	49 - 136		

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*87*		*75 - 130*
4-Bromofluorobenzene (Surr)	*98*		*47 - 134*
Toluene-d8 (Surr)	*93*		*69 - 122*
Dibromofluoromethane (Surr)	*89*		*78 - 129*

Lab Sample ID: 240-144568-E-2 MSD
Matrix: Water
Analysis Batch: 474307

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.63		ug/L		96	64 - 132	1	35
cis-1,2-Dichloroethene	0.43	J	10.0	10.2		ug/L		98	68 - 121	1	35
Tetrachloroethene	1.0	U	10.0	8.84		ug/L		88	52 - 129	8	35
trans-1,2-Dichloroethene	1.0	U	10.0	9.59		ug/L		96	69 - 126	2	35
Trichloroethene	1.0	U	10.0	9.53		ug/L		95	56 - 124	2	35
Vinyl chloride	1.0	U	10.0	11.7		ug/L		117	49 - 136	2	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*86*		*75 - 130*
4-Bromofluorobenzene (Surr)	*100*		*47 - 134*
Toluene-d8 (Surr)	*92*		*69 - 122*
Dibromofluoromethane (Surr)	*91*		*78 - 129*

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

Lab Sample ID: MB 240-474283/5
Matrix: Water
Analysis Batch: 474283

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/24/21 11:01	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*86*		*70 - 133*		*02/24/21 11:01*	*1*

Lab Sample ID: LCS 240-474283/4
Matrix: Water
Analysis Batch: 474283

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane			10.0	10.5		ug/L		105	80 - 135		

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

Lab Sample ID: 240-144568-J-2 MS
Matrix: Water
Analysis Batch: 474283

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dioxane	2.0	U	10.0	9.90		ug/L		99	46 - 170		

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

Lab Sample ID: 240-144568-J-2 MSD
Matrix: Water
Analysis Batch: 474283

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	9.89		ug/L		99	46 - 170	0	26

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*82*		*70 - 133*

GC/MS VOA

Analysis Batch: 474283

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144567-3	MW-118S_021521	Total/NA	Water	8260B SIM	
MB 240-474283/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-474283/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144568-J-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144568-J-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 474305

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144567-1	TRIP BLANK	Total/NA	Water	8260B	
MB 240-474305/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474305/4	Lab Control Sample	Total/NA	Water	8260B	
240-144568-B-3 MS	Matrix Spike	Total/NA	Water	8260B	
240-144568-E-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 474307

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144567-3	MW-118S_021521	Total/NA	Water	8260B	
MB 240-474307/7	Method Blank	Total/NA	Water	8260B	
LCS 240-474307/4	Lab Control Sample	Total/NA	Water	8260B	
240-144568-D-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-144568-E-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

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

Job ID: 240-144567-1

Client Sample ID: TRIP BLANK
Date Collected: 02/15/21 00:00
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144567-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474305	02/24/21 21:53	LRW	TAL CAN

Client Sample ID: MW-118S_021521
Date Collected: 02/15/21 12:28
Date Received: 02/17/21 08:00

Lab Sample ID: 240-144567-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	474307	02/24/21 15:21	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	474283	02/24/21 18:36	SAM	TAL CAN

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

Accreditation/Certification Summary

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

Job ID: 240-144567-1

Laboratory: Eurofins TestAmerica, Canton

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

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-21 *
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-24-21
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

0.4/6.5

Chain of Custody Record

MICHIGAN 190

TestAmerica

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

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact			
Company Name: Arcadis	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	Lab Contact: Mike DelMonico
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Analyses
Phone: 248-994-2240	Sampler Name: Kara Donahue	TAT if different from below: ☐ 3 weeks ✔ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day; 10 day	
Project Name: Ford LTP Off-Site	Method of Shipment/Carrier:		
Project Number: 30050315.402.04	Shipping/Tracking No:		
PO # 30050315.402.04			

COC No: — 1 of 1 COCs — For lab use only: Walk-in client; Lab sampling; Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other	H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other	Filtered Sample (Y/N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions
TRIP BLANK	—	—		1						1					N	G	X	X	X	X	X	X	X	1 Trip Blank
MW-156S_021521	2/15/21	1028		6						6					N	G	X	X	X	X	X	X	X	3 VOAs for 8260B; 3 VOAs for 8260B SIM
MW-118S_021521	2/15/21	1228		6						6					N	G	X	X	X	X	X	X	X	
MW-223S_021521	2/15/21	1508		6						6					N	G	X	X	X	X	X	X	X	

240-144567 Chain of Custody

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

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

Special Instructions/QC Requirements & Comments:

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

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
Kara Donahue	Arcadis	2/15/21 1653	Novi Cold Storage	Arcadis	2/15/21 1653
Christin Ulery	ARCADIS	2/16/21 / 1009	Amanda Battershell	ETA	2/16/21 / 10:09
Amanda Battershell	ETA	2/16/21 12:40	Received in Laboratory by: [signature]	ETA	2-17-21 800

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 144567**
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: MathSmg

Cooler Received on 2-17-21 Opened on 2-17-21

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

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

TestAmerica Cooler # NA Foam Box Client Cooler Box Other _____

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

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 0.4 °C Corrected Cooler Temp. 0.5 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 (Yes) No
   -Were the seals on the outside of the cooler(s) signed & dated? (Yes) No NA
   -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes (No)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? (Yes) No
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? (Yes) No
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC? (Yes) No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)? (Y) (Y) (Y)
10. Were correct bottle(s) used for the test(s) indicated? (Yes) No
11. Sufficient quantity received to perform indicated analyses? (Yes) No
12. Are these work share samples and all listed on the COC? Yes (No)
    If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# **HC907861**
14. Were VOAs on the COC? (Yes) No
15. Were air bubbles >6 mm in any VOA vials? ● ← Larger than this. Yes (No) NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #_____ (Yes) No
17. Was a LL Hg or Me Hg trip blank present? _____ Yes (No)

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

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

Concerning _____

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

Samples processed by:

19. SAMPLE CONDITION

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

20. SAMPLE PRESERVATION

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

VOA Sample Preservation - Date/Time VOAs Frozen: _____

DATA VERIFICATION REPORT

March 03, 2021

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

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144567-1
Sample date: 2021-02-15
Report received by CADENA: 2021-03-03
Initial Data Verification completed by CADENA: 2021-03-03
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC
Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch 474305 LCS recovery was outlying biased high for the following analyte: TETRACHLOROETHENE. Associated client sample results were non-detect so qualification was not required based on this high bias QC outlier.

GCMS VOC QC batch MS/MSD surrogate recovery outliers were not determined using a client sample so qualification was not required based on these sample-specific QC outliers.

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

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

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

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

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

CADENA Valid Qualifiers

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

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631
Laboratory: TestAmerica - North Canton
Laboratory Submittal: 144567-1

		Sample Name:	TRIP BLANK				MW-118S_021521			
		Lab Sample ID:	2401445671				2401445673			
		Sample Date:	2/15/2021				2/15/2021			
Analyte	Cas No.	Result	Report Limit	Units	Valid Qualifier	Result	Report Limit	Units	Valid Qualifier
GC/MS VOC									
OSW-8260B									
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---
OSW-8260BBSim									
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---

ARCADIS

SHALLOW LOW-FLOW GROUNDWATER SAMPLING FORM

Project No.	30050315.402.01	Well ID	MW-118S			Date	2-15-21
Project Name/Location		Ford LTP		Weather	14.0 degrees F and . The wind is blowing N at 8.1 mph.		
Measuring Pt. Description	Top of Casing	Screen Setting (ft-bmp)	2.5-12.5	Casing Diameter (in.)	2	Well Material	PVC
Static Water Level (ft-bmp)	6.42	Total Depth (ft-bmp)	12.43	Water Column (ft.)	6.01	Gallons in Well	0.98
		Pump Intake (ft-bmp)	7.92	Purge Method	Low-Flow	Sample Method	Grab
		Well Volumes Purged	1.59				
Sample Time: Label	12:28	Volume Purged	1.56 gallons	Replicate/Code No.	_	Sampled by	Kara Donahue
Purge Start	11:23						
Purge End	12:31						

Time	Minutes Elapsed between Readings	Flow Rate (mL/min) [100-300 mL/min]	Depth to Water (ft) [±0.3]	Total Gallons Purged	pH [± 0.1]	Cond. (mS/cm) [± 3%]	Turbidity (NTU) [± 10%*]	DO (mg/L) [± 10%]	Temp. (°C) [± 3%]	Redox (mV) [± 10mV]	Appearance	
											Color	Odor
11:25	0	100	6.43	0.00	7.37	0.58	0.47	6.97	6.7	79.7	Clear	No Odor
11:30	5	100	6.43	0.13	7.29	0.68	0.98	3.23	7.0	76.2	Clear	No Odor
11:35	5	100	6.43	0.26	7.13	1.63	0.02	2.23	7.7	70.3	Clear	No Odor
11:40	5	100	6.43	0.39	7.15	1.67	0.02	1.59	7.7	47.8	Clear	No Odor
11:45	5	100	6.43	0.52	7.15	1.76	0.02	1.48	7.3	29.2	Clear	No Odor
11:50	5	100	6.43	0.65	7.15	1.81	0.02	1.55	7.5	15.6	Clear	No Odor
11:55	5	100	6.43	0.78	7.15	1.90	0.02	1.32	7.3	3.3	Clear	No Odor
12:00	5	100	6.43	0.91	7.14	1.99	0.02	1.21	7.7	-5.7	Clear	No Odor
12:05	5	100	6.43	1.04	7.14	2.13	0.02	1.21	7.6	-13.9	Clear	No Odor
12:10	5	100	6.43	1.17	7.13	2.19	0.02	1.13	7.5	-21.5	Clear	No Odor
12:15	5	100	6.43	1.30	7.13	2.24	0.02	1.12	7.7	-26.4	Clear	No Odor
12:20	5	100	6.43	1.43	7.13	2.26	0.02	1.06	7.7	-31.7	Clear	No Odor
12:25	5	100	6.43	1.56	7.12	2.30	0.02	1.09	7.8	-35.4	Clear	No Odor
_	_	_	_	_	_	_	_	_	_	_	_	_
_	_	_	_	_	_	_	_	_	_	_	_	_
_	_	_	_	_	_	_	_	_	_	_	_	_
_	_	_	_	_	_	_	_	_	_	_	_	_
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_	_	_	_	_	_	_	_	_	_	_	_	_
_	_	_	_	_	_	_	_	_	_	_	_	_

* **Turbidity** < 50 NTU and ±10% or within 1 NTU of a previous reading when <10 NTU

Constituents Sampled	Container	Number	Preservative
1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, PCE, TCE, VC	40 mL Glass	3	HCL
1,4-dioxane	40 mL Glass	3	HCL

Comments

None

Well Casing Volumes

Gallons/Foot — *1" = 0.04* | *1.25" = 0.06* | *1.5" = 0.09* | *2" = 0.16* | *2.5" = 0.26* | *3" = 0.37* | *3.5" = 0.50* | *4" = 0.65* | *6" = 1.47*

Well Information

Well Location:	12124 Boston Post; front yard	Well Locked at Arrival:	yes
Condition of Well:	Fair	Well Locked at Departure:	yes
Well Completion:	Flush mount	Lock Functioning:	yes

ARCADIS Design & Consultancy for natural and built assets

SHALLOW LOW-FLOW GROUNDWATER SAMPLING FORM

Project No.: 30050315.402.01 Page 1 of 1

Site Location: Ford LTP 12124 Boston Post; front yard

Prepared By: Kara Donahue

Date	Time	Description of Activities
2/15/2021	11:05	Arrive onsite
2/15/2021	23:15	Record static depth to water
2/15/2021	11:23	Begin purging well
2/15/2021	12:28	Collect sample MW-118S_021521
2/15/2021	12:31	End purge and turn off pump, begin decon of equipment
2/15/2021	12:40	Offsite
–	–	--
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ARCADIS

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

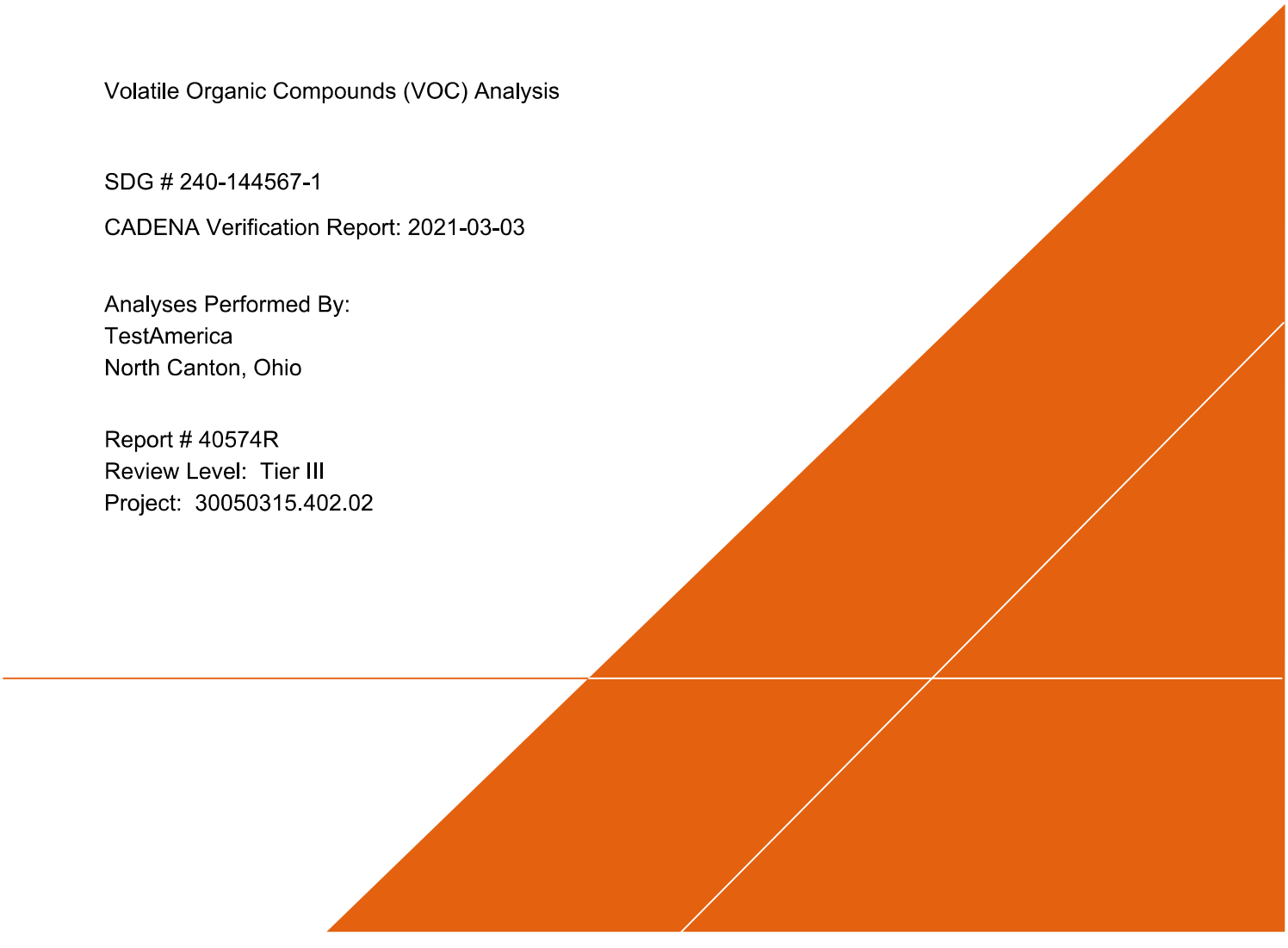
Volatile Organic Compounds (VOC) Analysis

SDG # 240-144567-1

CADENA Verification Report: 2021-03-03

Analyses Performed By:
TestAmerica
North Canton, Ohio

Report # 40574R
Review Level: Tier III
Project: 30050315.402.02



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144567-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144567-1	Water	02/15/2021		X	
MW-118S_021521	240-144567-3	Water	02/15/2021		X	X

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

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

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

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

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

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

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

- Concentration (C) Qualifiers

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

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

- Quantitation (Q) Qualifiers

  E The compound was quantitated above the calibration range.

  D Concentration is based on a diluted sample analysis.

- Validation Qualifiers

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

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

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

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

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

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

  R The sample results are rejected.

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

DATA REVIEW

VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

1. Holding Times

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

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

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

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

System performance and column resolution were acceptable.

3. Calibration

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

3.1 Initial Calibration

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

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

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

3.2 Continuing Calibration

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

All compounds associated with the calibrations were within the specified control limits, with the exception of the compounds presented in the following table.

Sample ID	Initial/Continuing	Lab file ID	Compound	Criteria
TRIP BLANK	CCV %D	UXR3152.D	Tetrachloroethene	+30.7%

The criteria used to evaluate the initial and continuing calibration are presented in the following table. In the case of a calibration deviation, the sample results are qualified.

Initial/Continuing	Criteria	Sample Result	Qualification
Initial and Continuing Calibration	RRF <0.05	Non-detect	R
		Detect	J
	RRF <0.01[1]	Non-detect	R
		Detect	J
	RRF >0.05 or RRF >0.01[1]	Non-detect	No Action

Initial/Continuing	Criteria	Sample Result	Qualification
		Detect	
Initial Calibration	%RSD > 15% or a correlation coefficient <0.99	Non-detect	UJ
		Detect	J
	%RSD >90%	Non-detect	R
		Detect	J
Continuing Calibration	%D >20% (increase in sensitivity)	Non-detect	No Action
		Detect	J
	%D >20% (decrease in sensitivity)	Non-detect	UJ
		Detect	J
	%D >90% (increase/decrease in sensitivity)	Non-detect	R
		Detect	J

Note:

[1] RRF of 0.01 only applies to compounds which are typically poor responding compounds (i.e., ketones, 1,4-dioxane, etc.)

4. Internal Standard Performance

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

All internal standard responses were within control limits.

5. Field Duplicate Analysis

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

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

6. Compound Identification

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

No compounds were detected in the samples within this SDG.

7. System Performance and Overall Assessment

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

DATA REVIEW

DATA VALIDATION CHECKLIST FOR VOCs

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

Notes:

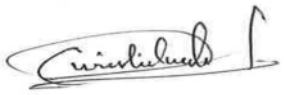
%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 17, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS