

ANALYTICAL REPORT

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

Laboratory Job ID: 240-148869-1
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:
5/21/2021 10:41:00 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.



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Definitions/Glossary

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

Job ID: 240-148869-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
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.
α	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

Case Narrative

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

Job ID: 240-148869-1

Job ID: 240-148869-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative 240-148869-1

Comments

No additional comments.

Receipt

The samples were received on 5/7/2021 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 1.7° C.

GC/MS VOA

Method 8260B: The continuing calibration verification (CCV) associated with batch 486016 recovered above the upper control limit for Vinyl Chloride. The samples associated with this CCV were non-detect for the affected analyte; therefore, the data have been reported. The associated samples are impacted: TRIP BLANK_26 (240-148869-1) and MW-128S_050521 (240-148869-2).

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: 240-148869-1

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

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

Sample Summary

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

Job ID: 240-148869-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-148869-1	TRIP BLANK_26	Water	05/05/21 00:00	05/07/21 08:00	
240-148869-2	MW-128S_050521	Water	05/05/21 15:37	05/07/21 08:00	

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

Detection Summary

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

Job ID: 240-148869-1

Client Sample ID: TRIP BLANK_26

Lab Sample ID: 240-148869-1

No Detections.

Client Sample ID: MW-128S_050521

Lab Sample ID: 240-148869-2

No Detections.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Canton

Client Sample Results

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

Job ID: 240-148869-1

Client Sample ID: TRIP BLANK_26

Lab Sample ID: 240-148869-1

Date Collected: 05/05/21 00:00

Matrix: Water

Date Received: 05/07/21 08:00

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			05/16/21 20:15	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			05/16/21 20:15	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			05/16/21 20:15	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			05/16/21 20:15	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			05/16/21 20:15	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			05/16/21 20:15	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	115		75 - 130		05/16/21 20:15	1
4-Bromofluorobenzene (Surr)	67		47 - 134		05/16/21 20:15	1
Toluene-d8 (Surr)	83		69 - 122		05/16/21 20:15	1
Dibromofluoromethane (Surr)	109		78 - 129		05/16/21 20:15	1

Client Sample Results

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

Job ID: 240-148869-1

Client Sample ID: MW-128S_050521

Lab Sample ID: 240-148869-2

Date Collected: 05/05/21 15:37

Matrix: Water

Date Received: 05/07/21 08:00

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			05/11/21 16:19	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	85		70 - 133		05/11/21 16:19	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			05/16/21 20:37	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			05/16/21 20:37	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			05/16/21 20:37	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			05/16/21 20:37	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			05/16/21 20:37	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			05/16/21 20:37	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	113		75 - 130		05/16/21 20:37	1
4-Bromofluorobenzene (Surr)	68		47 - 134		05/16/21 20:37	1
Toluene-d8 (Surr)	82		69 - 122		05/16/21 20:37	1
Dibromofluoromethane (Surr)	109		78 - 129		05/16/21 20:37	1

Surrogate Summary

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

Job ID: 240-148869-1

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

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	DCA	BFB	TOL	DBFM
		(75-130)	(47-134)	(69-122)	(78-129)
240-148666-E-10 MS	Matrix Spike	92	96	92	94
240-148666-E-10 MSD	Matrix Spike Duplicate	93	94	94	94
240-148869-1	TRIP BLANK_26	115	67	83	109
240-148869-2	MW-128S_050521	113	68	82	109
LCS 240-486016/4	Lab Control Sample	91	93	93	90
MB 240-486016/35	Method Blank	105	69	81	99

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)

Lab Sample ID	Client Sample ID	DCA
		(70-133)
240-148869-2	MW-128S_050521	85
240-149041-H-2 MS	Matrix Spike	83
240-149041-N-2 MSD	Matrix Spike Duplicate	82
LCS 240-485164/4	Lab Control Sample	81
MB 240-485164/5	Method Blank	81

Surrogate Legend

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

QC Sample Results

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

Job ID: 240-148869-1

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

Lab Sample ID: MB 240-486016/35
Matrix: Water
Analysis Batch: 486016

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			05/16/21 15:31	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			05/16/21 15:31	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			05/16/21 15:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			05/16/21 15:31	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			05/16/21 15:31	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			05/16/21 15:31	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	105		75 - 130		05/16/21 15:31	1
4-Bromofluorobenzene (Surr)	69		47 - 134		05/16/21 15:31	1
Toluene-d8 (Surr)	81		69 - 122		05/16/21 15:31	1
Dibromofluoromethane (Surr)	99		78 - 129		05/16/21 15:31	1

Lab Sample ID: LCS 240-486016/4
Matrix: Water
Analysis Batch: 486016

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	9.52		ug/L		95	73 - 129
cis-1,2-Dichloroethene	10.0	9.95		ug/L		99	75 - 124
Tetrachloroethene	10.0	9.83		ug/L		98	70 - 125
trans-1,2-Dichloroethene	10.0	10.5		ug/L		105	74 - 130
Trichloroethene	10.0	9.18		ug/L		92	71 - 121
Vinyl chloride	10.0	10.9		ug/L		109	61 - 134

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	91		75 - 130
4-Bromofluorobenzene (Surr)	93		47 - 134
Toluene-d8 (Surr)	93		69 - 122
Dibromofluoromethane (Surr)	90		78 - 129

Lab Sample ID: 240-148666-E-10 MS
Matrix: Water
Analysis Batch: 486016

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	20	U	200	173		ug/L		87	64 - 132
cis-1,2-Dichloroethene	220		200	389		ug/L		83	68 - 121
Tetrachloroethene	20	U	200	172		ug/L		86	52 - 129
trans-1,2-Dichloroethene	20	U	200	203		ug/L		102	69 - 126
Trichloroethene	20	U	200	172		ug/L		86	56 - 124
Vinyl chloride	7.3	J	200	234		ug/L		113	49 - 136

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	92		75 - 130
4-Bromofluorobenzene (Surr)	96		47 - 134
Toluene-d8 (Surr)	92		69 - 122

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QC Sample Results

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

Job ID: 240-148869-1

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

Lab Sample ID: 240-148666-E-10 MS
Matrix: Water
Analysis Batch: 486016

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

Surrogate	MS MS		Limits
	%Recovery	Qualifier	
Dibromofluoromethane (Surr)	94		78 - 129

Lab Sample ID: 240-148666-E-10 MSD
Matrix: Water
Analysis Batch: 486016

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

Analyte	Sample	Sample	Spike	MSD		Unit	D	%Rec	%Rec.		RPD	Limit
	Result	Qualifier		Result	Qualifier				Limits	RPD		
1,1-Dichloroethene	20	U	200	226		ug/L		113	64 - 132	27	35	
cis-1,2-Dichloroethene	220		200	392		ug/L		84	68 - 121	1	35	
Tetrachloroethene	20	U	200	176		ug/L		88	52 - 129	2	35	
trans-1,2-Dichloroethene	20	U	200	200		ug/L		100	69 - 126	2	35	
Trichloroethene	20	U	200	171		ug/L		86	56 - 124	0	35	
Vinyl chloride	7.3	J	200	250		ug/L		121	49 - 136	7	35	

Surrogate	MSD MSD		Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	93		75 - 130
4-Bromofluorobenzene (Surr)	94		47 - 134
Toluene-d8 (Surr)	94		69 - 122
Dibromofluoromethane (Surr)	94		78 - 129

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

Lab Sample ID: MB 240-485164/5
Matrix: Water
Analysis Batch: 485164

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

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			05/11/21 14:15	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
1,2-Dichloroethane-d4 (Surr)	81		70 - 133		05/11/21 14:15	1

Lab Sample ID: LCS 240-485164/4
Matrix: Water
Analysis Batch: 485164

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

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

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

Lab Sample ID: 240-149041-H-2 MS
Matrix: Water
Analysis Batch: 485164

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

Analyte	Sample	Sample	Spike	MS MS		Unit	D	%Rec	%Rec.	
	Result	Qualifier		Result	Qualifier				Limits	RPD
1,4-Dioxane	2.0	U	10.0	10.1		ug/L		101	46 - 170	

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QC Sample Results

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

Job ID: 240-148869-1

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

<i>Surrogate</i>	<i>%Recovery</i>	<i>MS MS Qualifier</i>	<i>Limits</i>
1,2-Dichloroethane-d4 (Surr)	83		70 - 133

Lab Sample ID: 240-149041-N-2 MSD
 Matrix: Water
 Analysis Batch: 485164

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

<i>Analyte</i>	<i>Sample Result</i>	<i>Sample Qualifier</i>	<i>Spike Added</i>	<i>MSD Result</i>	<i>MSD Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>%Rec. Limits</i>	<i>RPD</i>	<i>RPD Limit</i>
1,4-Dioxane	2.0	U	10.0	10.0		ug/L		100	46 - 170	1	26

<i>Surrogate</i>	<i>%Recovery</i>	<i>MSD MSD Qualifier</i>	<i>Limits</i>
1,2-Dichloroethane-d4 (Surr)	82		70 - 133



QC Association Summary

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

Job ID: 240-148869-1

GC/MS VOA

Analysis Batch: 485164

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-148869-2	MW-128S_050521	Total/NA	Water	8260B SIM	
MB 240-485164/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-485164/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-149041-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-149041-N-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 486016

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-148869-1	TRIP BLANK_26	Total/NA	Water	8260B	
240-148869-2	MW-128S_050521	Total/NA	Water	8260B	
MB 240-486016/35	Method Blank	Total/NA	Water	8260B	
LCS 240-486016/4	Lab Control Sample	Total/NA	Water	8260B	
240-148666-E-10 MS	Matrix Spike	Total/NA	Water	8260B	
240-148666-E-10 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

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

Job ID: 240-148869-1

Client Sample ID: TRIP BLANK_26

Lab Sample ID: 240-148869-1

Date Collected: 05/05/21 00:00

Matrix: Water

Date Received: 05/07/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	486016	05/16/21 20:15	LEE	TAL CAN

Client Sample ID: MW-128S_050521

Lab Sample ID: 240-148869-2

Date Collected: 05/05/21 15:37

Matrix: Water

Date Received: 05/07/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	486016	05/16/21 20:37	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	485164	05/11/21 16:19	CS	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: 240-148869-1



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	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-22
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	03-31-22
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
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.



Eurofins TestAmerica Canton Sample Receipt Form/Narrative		Login # : <u>148869</u>
Canton Facility		
Client <u>ARCADIS</u>	Site Name _____	Cooler unpacked by: 
Cooler Received on <u>5-7-21</u>	Opened on <u>5-7-21</u>	
FedEx: 1 st Grd Exp <u>UPS FAS Chipper</u>	Client Drop Off <u>TestAmerica Courier</u>	Other _____
Receipt After-hours: Drop-off Date/Time		Storage Location
TestAmerica Cooler # <u>TA</u>	Foam Box _____	Client Cooler _____
Packing material used: <u>Bubble Wrap</u>	Foam _____	Plastic Bag _____
COOLANT: <u>Wet Ice</u>	Blue Ice _____	Dry Ice _____
	Water _____	None _____
1. Cooler temperature upon receipt	<input type="checkbox"/> See Multiple Cooler Form	
IR GUN# IR-11 (CF +0.1 °C)	Observed Cooler Temp. <u>1.6</u> °C	Corrected Cooler Temp. <u>1.7</u> °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 <u>1</u>	<input checked="" type="radio"/> Yes	<input type="radio"/> No
-Were the seals on the outside of the cooler(s) signed & dated?	<input checked="" type="radio"/> Yes	<input type="radio"/> No <input type="radio"/> NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
-Were tamper/custody seals intact and uncompromised?	<input checked="" type="radio"/> Yes	<input type="radio"/> No <input type="radio"/> NA
3. Shippers' packing slip attached to the cooler(s)?	<input type="radio"/> Yes	<input checked="" type="radio"/> No
4. Did custody papers accompany the sample(s)?	<input checked="" type="radio"/> Yes	<input type="radio"/> No
5. Were the custody papers relinquished & signed in the appropriate place?	<input checked="" type="radio"/> Yes	<input type="radio"/> No
6. Was/were the person(s) who collected the samples clearly identified on the COC?	<input checked="" type="radio"/> Yes	<input type="radio"/> No
7. Did all bottles arrive in good condition (Unbroken)?	<input checked="" type="radio"/> Yes	<input type="radio"/> No
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	<input checked="" type="radio"/> Yes	<input type="radio"/> No
9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?	<input checked="" type="radio"/> Yes	<input type="radio"/> No
10. Were correct bottle(s) used for the test(s) indicated?	<input checked="" type="radio"/> Yes	<input type="radio"/> No
11. Sufficient quantity received to perform indicated analyses?	<input checked="" type="radio"/> Yes	<input type="radio"/> No
12. Are these work share samples and all listed on the COC?	<input type="radio"/> Yes	<input checked="" type="radio"/> 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?	<input type="radio"/> Yes	<input checked="" type="radio"/> No <input type="radio"/> NA pH Strip Lot# <u>HC022887</u>
14. Were VOAs on the COC?	<input checked="" type="radio"/> Yes	<input type="radio"/> No
15. Were air bubbles >6 mm in any VOA vials?  ← Larger than this.	<input type="radio"/> Yes	<input checked="" type="radio"/> No <input type="radio"/> NA
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____	<input checked="" type="radio"/> Yes	<input type="radio"/> No
17. Was a LL Hg or Me Hg trip blank present? _____	<input type="radio"/> Yes	<input checked="" type="radio"/> No
Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other _____		
Concerning _____		

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES	<input type="checkbox"/> 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: _____

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DATA VERIFICATION REPORT



May 21, 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: 30080642.402.04_W01 OFF-SITE GW

Event Specific Scope of Work References: Sample COC

Laboratory: TestAmerica - North Canton

Laboratory submittal: 148869-1

Sample date: 2021-05-05

Report received by CADENA: 2021-05-21

Initial Data Verification completed by CADENA: 2021-05-21

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 CCV response outliers as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

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 contaminants) 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 contaminants) 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: 148869-1

Sample Name: TRIP BLANK_26 MW-128S_050521
Lab Sample ID: 2401488691 2401488692
Sample Date: 5/5/2021 5/5/2021

Analyte	Cas No.	Report		Units	Valid Qualifier	Report		Units	Valid Qualifier	
		Result	Limit			Result	Limit			
GC/MS VOC										
<u>OSW-8260B</u>										
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	---	
<u>OSW-8260BBSim</u>										
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

Volatile Organic Compounds (VOC) Analysis

SDG # 240-148869-1

CADENA Verification Report: 2021-05-21

Analyses Performed By:


TestAmerica

North Canton, Ohio

Report # 41499R

Review Level: Tier III

Project: 30080642.402.04



DATA REVIEW

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-148869-1 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	240-148869-1	Water	05/05/2021		X	
MW-128S_050521	240-148869-2	Water	05/05/2021		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	Compound	Criteria
TRIP BLANK MW-128S_050521	CCV %D	Vinyl Chloride	+21.8%

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

DATA REVIEW

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

DATA REVIEW

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: May 31, 2021

PEER REVIEW: Andrew Korycinski

DATE: May 31, 2021

**NO CORRECTIONS/QUALIFIERS ADDED
TO SAMPLE ANALYSIS DATA SHEETS**



**CHAIN OF CUSTODY
CORRECTED SAMPLE ANALYSIS DATA
SHEETS**



Client Sample Results

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

Job ID: 240-148869-1

Client Sample ID: TRIP BLANK_26

Lab Sample ID: 240-148869-1

Date Collected: 05/05/21 00:00

Matrix: Water

Date Received: 05/07/21 08:00

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			05/16/21 20:15	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			05/16/21 20:15	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			05/16/21 20:15	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			05/16/21 20:15	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			05/16/21 20:15	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			05/16/21 20:15	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	115		75 - 130		05/16/21 20:15	1
4-Bromofluorobenzene (Surr)	67		47 - 134		05/16/21 20:15	1
Toluene-d8 (Surr)	83		69 - 122		05/16/21 20:15	1
Dibromofluoromethane (Surr)	109		78 - 129		05/16/21 20:15	1

Client Sample ID: MW-128S_050521

Lab Sample ID: 240-148869-2

Date Collected: 05/05/21 15:37

Matrix: Water

Date Received: 05/07/21 08:00

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			05/11/21 16:19	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	85		70 - 133		05/11/21 16:19	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			05/16/21 20:37	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			05/16/21 20:37	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			05/16/21 20:37	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			05/16/21 20:37	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			05/16/21 20:37	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			05/16/21 20:37	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	113		75 - 130		05/16/21 20:37	1
4-Bromofluorobenzene (Surr)	68		47 - 134		05/16/21 20:37	1
Toluene-d8 (Surr)	82		69 - 122		05/16/21 20:37	1
Dibromofluoromethane (Surr)	109		78 - 129		05/16/21 20:37	1