

Environment Testing America

ANALYTICAL REPORT

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

Laboratory Job ID: 240-159955-1 Client Project/Site: Ford LTP - Off-Site

For:

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

Attn: Kristoffer Hinskey

Mode Del Your

Authorized for release by: 11/29/2021 8:30:31 AM

Michael DelMonico, Project Manager I (330)497-9396

Michael.DelMonico@Eurofinset.com

·····LINKS ······

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

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

Client: ARCADIS U.S., Inc. Project/Site: Ford LTP - Off-Site Laboratory Job ID: 240-159955-1

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Definitions/Glossary

Client: ARCADIS U.S., Inc. Job ID: 240-159955-1

Project/Site: Ford LTP - Off-Site

Qualifiers

GC/MS VOA

Qualifier Qualifier Description

*+ LCS and/or LCSD is outside acceptance limits, high 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.

Example 2 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

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Case Narrative

Client: ARCADIS U.S., Inc.

Job ID: 240-159955-1

Project/Site: Ford LTP - Off-Site

Job ID: 240-159955-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative 240-159955-1

Comments

No additional comments.

Receipt

The samples were received on 11/12/2021 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 0.6° C.

GC/MS VOA

Method 8260B: The continuing calibration verification (CCV) associated with batch 513804 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_111 (240-159955-1) and MW-90S_111021 (240-159955-2).

Method 8260B: The laboratory control sample (LCS) for 513804 recovered outside control limits for Tetrachloroethene. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported.

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.

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Method Summary

Client: ARCADIS U.S., Inc. Project/Site: Ford LTP - Off-Site Job ID: 240-159955-1

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

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Sample Summary

Client: ARCADIS U.S., Inc.

Job ID: 240-159955-1

Project/Site: Ford LTP - Off-Site

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159955-1	TRIP BLANK_111	Water	11/10/21 00:00	11/12/21 08:00
240-159955-2	MW-90S 111021	Water	11/10/21 13:35	11/12/21 08:00

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Detection Summary

Client: ARCADIS U.S., Inc. Job ID: 240-159955-1

Project/Site: Ford LTP - Off-Site

Client Sample ID: TRIP BLANK_111 Lab Sample ID: 240-159955-1

No Detections.

No Detections.

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Client Sample Results

Client: ARCADIS U.S., Inc. Job ID: 240-159955-1

Project/Site: Ford LTP - Off-Site

Client Sample ID: TRIP BLANK_111

Date Collected: 11/10/21 00:00 Date Received: 11/12/21 08:00 Lab Sample ID: 240-159955-1

Matrix: Water

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 17:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 17:52	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/19/21 17:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 17:52	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 17:52	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 17:52	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	98		62 - 137					11/19/21 17:52	1
4-Bromofluorobenzene (Surr)	72		56 ₋ 136					11/19/21 17:52	1
Toluene-d8 (Surr)	111		78 - 122					11/19/21 17:52	1
Dibromofluoromethane (Surr)	92		73 - 120					11/19/21 17:52	1

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Client Sample Results

Client: ARCADIS U.S., Inc. Job ID: 240-159955-1

Project/Site: Ford LTP - Off-Site

Client Sample ID: MW-90S_111021

Lab Sample ID: 240-159955-2 Date Collected: 11/10/21 13:35

Matrix: Water Date Received: 11/12/21 08:00

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/18/21 03:08	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	87		66 - 120					11/18/21 03:08	1
Method: 8260B - Volatile O	rganic Compo	unds (GC/I	MS)						
Analyte	•	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 18:15	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 18:15	1
Tetrachloroethene	1.0	U *+	1.0	0.44	ug/L			11/19/21 18:15	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 18:15	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 18:15	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 18:15	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	99		62 - 137			•		11/19/21 18:15	1
4-Bromofluorobenzene (Surr)	70		56 ₋ 136					11/19/21 18:15	1
Toluene-d8 (Surr)	115		78 - 122					11/19/21 18:15	1
Dibromofluoromethane (Surr)	92		73 - 120					11/19/21 18:15	1

11/29/2021

Surrogate Summary

Client: ARCADIS U.S., Inc. Job ID: 240-159955-1

Project/Site: Ford LTP - Off-Site

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

Matrix: Water Prep Type: Total/NA

			Pe	ercent Surre	ogate Reco
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(62-137)	(56-136)	(78-122)	(73-120)
240-159953-A-2 MS	Matrix Spike	100	85	115	96
240-159953-D-2 MSD	Matrix Spike Duplicate	99	87	112	92
240-159955-1	TRIP BLANK_111	98	72	111	92
240-159955-2	MW-90S_111021	99	70	115	92
LCS 240-513804/4	Lab Control Sample	100	87	118	98
MB 240-513804/6	Method Blank	105	81	118	101

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	(66-120)	
240-159642-H-3 MS	Matrix Spike	87	
240-159642-M-3 MSD	Matrix Spike Duplicate	87	
240-159955-2	MW-90S_111021	87	
LCS 240-513480/3	Lab Control Sample	84	
MB 240-513480/4	Method Blank	84	
Surrogate Legend			

Eurofins TestAmerica, Canton

Client: ARCADIS U.S., Inc. Job ID: 240-159955-1

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

Lab Sample ID: MB 240-513804/6

Matrix: Water

Analysis Batch: 513804

Project/Site: Ford LTP - Off-Site

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

MB MB Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac Analyte D 0.49 ug/L 1,1-Dichloroethene 1.0 U 1.0 11/19/21 15:38 cis-1,2-Dichloroethene 1.0 U 1.0 0.46 ug/L 11/19/21 15:38 1.0 U 0.44 ug/L Tetrachloroethene 1.0 11/19/21 15:38 trans-1,2-Dichloroethene 1.0 U 1.0 0.51 ug/L 11/19/21 15:38 Trichloroethene 1.0 U 1.0 0.44 ug/L 11/19/21 15:38 Vinyl chloride 1.0 U 1.0 0.45 ug/L 11/19/21 15:38

MB MB Surrogate %Recovery Qualifier Limits Prepared Dil Fac Analyzed 105 62 - 137 1,2-Dichloroethane-d4 (Surr) 11/19/21 15:38 4-Bromofluorobenzene (Surr) 81 56 - 136 11/19/21 15:38 78 - 122 11/19/21 15:38 Toluene-d8 (Surr) 118 Dibromofluoromethane (Surr) 101 73 - 120 11/19/21 15:38

Lab Sample ID: LCS 240-513804/4

Matrix: Water

Analysis Batch: 513804

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
1,1-Dichloroethene	10.0	11.0		ug/L		110	63 - 134	
cis-1,2-Dichloroethene	10.0	11.0		ug/L		110	77 - 123	
Tetrachloroethene	10.0	13.0	*+	ug/L		130	76 - 123	
trans-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124	
Trichloroethene	10.0	9.54		ug/L		95	70 - 122	
Vinyl chloride	10.0	11.1		ug/L		111	60 - 144	

LCS LCS Surrogate %Recovery Qualifier Limits 1,2-Dichloroethane-d4 (Surr) 100 62 - 137 4-Bromofluorobenzene (Surr) 87 56 - 136 Toluene-d8 (Surr) 118 78 - 122 73 - 120 Dibromofluoromethane (Surr) 98

Lab Sample ID: 240-159953-A-2 MS

Matrix: Water

Analysis Batch: 513804

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

1.0 1.0		Added 10.0	Result 10.4	Qualifier	Unit	<u>D</u>	%Rec	Limits
		10.0	10.4		ua/I		404	
1 0					ug/L		104	56 - 135
1.0	U	10.0	10.3		ug/L		103	66 - 128
1.0	U *+	10.0	10.2		ug/L		102	62 - 131
1.0	U	10.0	10.4		ug/L		104	56 - 136
1.0	U	10.0	8.59		ug/L		86	61 - 124
1.0	U	10.0	10.2		ug/L		102	43 - 157
	1.0 1.0	1.0 U*+ 1.0 U 1.0 U 1.0 U	1.0 U 10.0 1.0 U 10.0	1.0 U 10.0 10.4 1.0 U 10.0 8.59	1.0 U 10.0 10.4 1.0 U 10.0 8.59	1.0 U 10.0 10.4 ug/L 1.0 U 10.0 8.59 ug/L	1.0 U 10.0 10.4 ug/L 1.0 U 10.0 8.59 ug/L	1.0 U 10.0 10.4 ug/L 104 1.0 U 10.0 8.59 ug/L 86

	MS	MS	
Surrogate	%Recovery	Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	100		62 - 137
4-Bromofluorobenzene (Surr)	85		56 - 136
Toluene-d8 (Surr)	115		78 - 122

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Job ID: 240-159955-1

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

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

Lab Sample ID: 240-159953-A-2 MS

Matrix: Water

Analysis Batch: 513804

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

MS MS

%Recovery Qualifier Surrogate Limits Dibromofluoromethane (Surr) 96 73 - 120

Lab Sample ID: 240-159953-D-2 MSD

Matrix: Water

Analysis Batch: 513804

Client Sample ID: Matrix Spike Duplicate

Prep Type: Total/NA

	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
1,1-Dichloroethene	1.0	U	10.0	9.86		ug/L		99	56 - 135	5	26
cis-1,2-Dichloroethene	1.0	U	10.0	9.79		ug/L		98	66 - 128	5	14
Tetrachloroethene	1.0	U *+	10.0	9.63		ug/L		96	62 - 131	6	20
trans-1,2-Dichloroethene	1.0	U	10.0	9.82		ug/L		98	56 - 136	5	15
Trichloroethene	1.0	U	10.0	8.28		ug/L		83	61 - 124	4	15
Vinyl chloride	1.0	U	10.0	10.7		ug/L		107	43 - 157	5	24

MSD MSD

Surrogate	%Recovery	Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	99		62 - 137
4-Bromofluorobenzene (Surr)	87		56 - 136
Toluene-d8 (Surr)	112		78 - 122
Dibromofluoromethane (Surr)	92		73 - 120

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

Lab Sample ID: MB 240-513480/4

Matrix: Water

Analysis Batch: 513480

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

%Rec.

MB MB Analyte Result Qualifier RL **MDL** Unit Prepared Analyzed Dil Fac 1,4-Dioxane 2.0 U 2.0 11/17/21 19:58 0.86 ug/L

MB MB

%Recovery Qualifier Surrogate Limits Prepared Analyzed Dil Fac 1,2-Dichloroethane-d4 (Surr) 66 - 120 84 11/17/21 19:58

Lab Sample ID: LCS 240-513480/3

Client Sample ID: Lab Control Sample **Matrix: Water** Prep Type: Total/NA **Analysis Batch: 513480**

LCS LCS

Result Qualifier

10.3

Unit

ug/L

Added Result Qualifier Limits Analyte Unit D %Rec 1,4-Dioxane 10.0 9.37 ug/L 94 80 - 122

Spike

Added

10.0

LCS LCS

Result Qualifier

2.0 U F1

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

Analyte

1,4-Dioxane

Lab Sample ID: 240-159642-H-	-3 MS				Client Sample ID: Matrix Spike
Matrix: Water					Prep Type: Total/NA
Analysis Batch: 513480					
	Sample	Sample	Spike	MS MS	%Rec.

Eurofins TestAmerica, Canton

Limits

51 - 153

%Rec

103

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QC Sample Results

Client: ARCADIS U.S., Inc. Job ID: 240-159955-1

Project/Site: Ford LTP - Off-Site

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

	MS	MS									
Surrogate	%Recovery	Qualifier	Limits								
1,2-Dichloroethane-d4 (Surr)	87		66 - 120								
Lab Sample ID: 240-1590 Matrix: Water Analysis Batch: 513480						Client	Samp	le ID: N	latrix Spil Prep Ty		
		Sample	Spike	MSD	MSD				%Rec.		RPD
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit
1,4-Dioxane	2.0	U F1	10.0	9.57		ug/L		96	51 - 153	7	16
	MSD	MSD									
Surrogate	%Recovery	Qualifier	Limits								
1,2-Dichloroethane-d4 (Surr)	87		66 - 120								

11/29/2021

QC Association Summary

Client: ARCADIS U.S., Inc.

Job ID: 240-159955-1

Project/Site: Ford LTP - Off-Site

GC/MS VOA

Analysis Batch: 513480

Lab Sample ID 240-159955-2	Client Sample ID MW-90S_111021	Prep Type Total/NA	Matrix Water	Method 8260B SIM	Prep Batch
MB 240-513480/4	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-513480/3	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159642-H-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159642-M-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 513804

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159955-1	TRIP BLANK_111	Total/NA	Water	8260B	
240-159955-2	MW-90S_111021	Total/NA	Water	8260B	
MB 240-513804/6	Method Blank	Total/NA	Water	8260B	
LCS 240-513804/4	Lab Control Sample	Total/NA	Water	8260B	
240-159953-A-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159953-D-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

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Lab Chronicle

Client: ARCADIS U.S., Inc. Job ID: 240-159955-1

Project/Site: Ford LTP - Off-Site

Lab Sample ID: 240-159955-1 Client Sample ID: TRIP BLANK_111

Date Collected: 11/10/21 00:00 **Matrix: Water** Date Received: 11/12/21 08:00

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B			513804	11/19/21 17:52	LEE	TAL CAN

Client Sample ID: MW-90S_111021 Lab Sample ID: 240-159955-2

Date Collected: 11/10/21 13:35 Date Received: 11/12/21 08:00

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	513804	11/19/21 18:15	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	513480	11/18/21 03:08	CS	TAL CAN

Laboratory References:

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

Matrix: Water

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.

Job ID: 240-159955-1

Project/Site: Ford LTP - Off-Site

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	06-30-22	
Georgia	State	4062	02-23-22	
Illinois	NELAP	200004	07-31-22	
Iowa	State	421	06-01-23	
Kansas	NELAP	E-10336	04-30-22	
Kentucky (UST)	State	112225	02-23-22	
Kentucky (WW)	State	KY98016	12-31-21	
Minnesota	NELAP	OH00048	12-31-21	
Minnesota (Petrofund)	State	3506	08-01-23	
New Jersey	NELAP	OH001	06-30-22	
New York	NELAP	10975	03-31-22	
Ohio VAP	State	CL0024	12-21-23	
Oregon	NELAP	4062	02-23-22	
Pennsylvania	NELAP	68-00340	08-31-22	
Texas	NELAP	T104704517-18-10	08-31-22	
Virginia	NELAP	11570	09-14-22	
Washington	State	C971	01-12-22	
West Virginia DEP	State	210	12-31-21	

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		Chain of Custody Record			TestAmerica
	Brighton	10448 Citation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763	16 / 810-229-2763		1 8 141 8 5 3
Client Contact Company Name: Arcadis	Regulatory program: DW	~ NPDES RCRA	Other		
	Client Project Manager: Kris Hinskey	Site Contact: Julia McClafferty	H oh Contract Miles BallMedies		TestAmerica Laboratorica, Inc.
Address: 28550 Cabot Drive, Suite 500			Lab Contact, 1910C Delivat	8	COC 140:
City/State/Zip: Novi, MI, 48377	1 erephone: 248-594-224U	Telephone: 734-644-5131	Telephone: 330-497-9396		
Phone: 248-994-2240	Email: kristoffer.hinskey@arcadis.com	Analysis Turnaround Time	Ana	Analyses	For lab use only
TO BOBECIA	1	TAT it different from below			Walk-m client
	Sommer and	3 weeks			in the second se
9642.402.04	Method of Shipment/Carrier:		B ==C		Sundanos oraș
PO#30080642.402.04	Shipping/Tracking No:	l day	Grab 60B 8260		Job/SDG No;
	Matrix	Containers & Preservatives)) E 85 500 500 =C\		
Sample Identification	Sample Date Sample Time Air Sediment Solid	Other: Other: NaOH HCI HCI H2SO4	Filtered Sa Composite: 1,1-DCE 82 cis-1,2-DCE Trans-1,2-D	Vinyl Chlori	Sample Specific Notes / Special Instructions:
TRIP BLANK_ \ \	×		×	**************************************	1 Trip Blank
MW-905-111021	11 10/21 13'35 X	3	VEXXXXXX	 	3 VOAs for 8260B
	+-			1	S VOAS TOT 8280B SIM
Pá					
age					
17 (
If 18					
3					
		### ### ### ### ### ### ### ### #### ####	240-159955 Chain of Custody		
Possible Hazard Identification		Sample Disposal (A fee may be as	sessed it samples are retained longer tha	T month	
Special Instructions/QC Requirements & Comments:	Poison B Unknown	Return to Client Die	Return to Client ' Disposal By Lab Archive For		
Submit all results through Cadena at jtomalia@cadenaco.com Cadena #E203631	om Cadena #E203631				
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DATA VERIFICATION REPORT



November 29, 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 WA03 OFF-SITE GW Event Specific Scope of Work References: Sample COC

Laboratory: TestAmerica - North Canton

Laboratory submittal: 159955-1 Sample date: 2021-11-10

Report received by CADENA: 2021-11-29

Initial Data Verification completed by CADENA: 2021-11-29

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 513804 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 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.
В	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.
Е	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: 159955-1

		Sample Name:	TRIP BLA	ANK_111	=		MW-909	_11102	1	
		Lab Sample ID:	2401599	9551			2401599	9552		
		Sample Date:	11/10/2	021			11/10/2	021		
				Report		Valid		Report		Valid
	Analyte	Cas No.	Result	Limit	Units	Qualifier	Result	Limit	Units	Qualifier
GC/MS VOC										
OSW-8260	<u>OB</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	
OSW-8260	<u>OBBSim</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 # 240-159955-1

CADENA Verification Report: 2021-11-29

Analyses Performed By: TestAmerica

North Canton, Ohio

Report # 43711R Review Level: Tier III Project: 30080642.402.04

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159955-1 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 Collection		Analysis		
Sample ID	Lab ID	Matrix Date		Parent Sample	voc	VOC SIM	
TRIP BLANK_111	240-159955-1	Water	11/10/21		Х		
MW-90S_111021	240-159955-2	Water	11/10/21		X	X	

ANALYTICAL DATA PACKAGE DOCUMENTATION

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

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

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.

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
		Vinyl chloride	+30.0%
TRIP BLANK_111 MW-90S 111021	Continuous Calibration Verification %D	cis-1,2-Dichloroethene	+20.5%
		Tetrachloroethene	+21.1%

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
	RRF <0.05	Non-detect	R
Initial and Continuing	RRF <0.05	Detect	J
Calibration	RRF <0.01 ¹	Non-detect	R
	KKF <0.01	Detect	J

Initial/Continuing	Criteria	Sample Result	Qualification
	DDE > 0.05 or DDE > 0.041	Non-detect	No Action
	RRF >0.05 or RRF >0.01 ¹	Detect	No Action
	%RSD > 20% or a correlation coefficient	Non-detect	UJ
L-141-1 O-111-1-41-1-	<0.99	Detect	J
Initial Calibration	0/ 505 - 000/	Non-detect	R
	%RSD > 90%	Detect	J
	0/D - 000/ /:	Non-detect	No Action
	%D >20% (increase in sensitivity)	Detect	J
	0/D - 000/ (1	Non-detect	UJ
Continuing Calibration	%D >20% (decrease in sensitivity)	Detect	J
	0/ D > 000/ (i.e (d i.e iti: it.)	Non-detect	R
	%D > 90% (increase/decrease in sensitivity)	Detect	J

Note:

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.

¹RRF of 0.01 only applies to compounds which are typically poor responding compounds

DATA VALIDATION CHECKLIST FOR VOCs

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

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE:

DATE: December 16, 2021

PEER REVIEW: Andrew Korycinski

DATE: December 16, 2021

NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

CHAIN OF CUSTODY CORRECTED SAMPLE ANALYSIS DATA SHEETS



Chain of Custody Record



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

Client Contact	7 Regula	tory program	` <u></u>		- D	w	,	NP	DES			CRA			Other		.700						•			11	1 - 4 11	71 t & 4	
Company Name: Arcadis															Ounc.	<u>' </u>											TestAmerica Lab	oratories. Inc.	
Address: 28550 Cabot Drive, Suite 500		Manager: Kris	Hinsk	tey			Site	e Cor	ntact: .	Julia	i McCl	laffe	rty				Lab C	ontac	t: Mik	e Dei	Monic	:0					COC No:	COC No:	
City/State/Zip: Novi, MI, 48377	Telephone: 248						Tel	lepho	one: 73	34-64	4-513	1				\exists	Telepi	none:	330-4	97-93	96								
Phone: 248-994-2240	Email: kristoff	fer.hinskey@ar	readis.	.com			上	Ans	alysis	lysis Turnaround Time					Analyses						1 of 1 For lab use only	COCs							
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Sample Identification	Sample Date	Sample Time	Alr	Aqueous	Sediment	Solid	H2SO4	HNO3	HCI	NaOH	ZnAc/ NaOil	Unpres		Filtered Sample (Y / N)	Composite=C/Grab=G	1,1-DCE 8260B	cls-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM					Sample Speci Special Inst	fic Notes / ructions:	
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Client Sample Results

Client: ARCADIS U.S., Inc. Job ID: 240-159955-1

Project/Site: Ford LTP - Off-Site

Client Sample ID: TRIP BLANK_111

Lab Sample ID: 240-159955-1 Date Collected: 11/10/21 00:00 **Matrix: Water**

Date Received: 11/12/21 08:00

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 17:52	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 17:52	1
Tetrachloroethene	1.0	U 🔭	1.0	0.44	ug/L			11/19/21 17:52	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 17:52	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 17:52	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 17:52	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	98		62 - 137					11/19/21 17:52	1
4-Bromofluorobenzene (Surr)	72		56 - 136					11/19/21 17:52	1
Toluene-d8 (Surr)	111		78 - 122					11/19/21 17:52	1
Dibromofluoromethane (Surr)	92		73 - 120					11/19/21 17:52	1

Client Sample ID: MW-90S_111021

Date Collected: 11/10/21 13:35

Date Received: 11/12/21 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			11/18/21 03:08	1				
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac				
1,2-Dichloroethane-d4 (Surr)	87		66 - 120				11/18/21 03:08	1				

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/19/21 18:15	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/19/21 18:15	1
Tetrachloroethene	1.0	U 🛰	1.0	0.44	ug/L			11/19/21 18:15	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/19/21 18:15	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/19/21 18:15	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/19/21 18:15	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	99		62 - 137		11/19/21 18:15	1
4-Bromofluorobenzene (Surr)	70		56 - 136		11/19/21 18:15	1
Toluene-d8 (Surr)	115		78 - 122		11/19/21 18:15	1
Dibromofluoromethane (Surr)	92		73 - 120		11/19/21 18:15	1

Lab Sample ID: 240-159955-2

Matrix: Water