# 🛟 eurofins

## Environment Testing America

## **ANALYTICAL REPORT**

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

## Laboratory Job ID: 240-159510-1

Client Project/Site: Ford LTP - Off-Site

## For:

.....Links

Review your project results through

**Total** Access

Have a Question?

Ask-

The

www.eurofinsus.com/Env

Visit us at:

Expert

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

Attn: Kristoffer Hinskey

Mole Del your

Authorized for release by: 11/22/2021 7:51:11 AM

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

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.

## **Table of Contents**

Cover Page	1
Table of Contents	2
Definitions/Glossary	3
Case Narrative	4
Method Summary	5
Sample Summary	6
Detection Summary	7
Client Sample Results	8
Surrogate Summary	10
QC Sample Results	11
QC Association Summary	14
Lab Chronicle	15
Certification Summary	16
Chain of Custody	17

## Qualifiers

Qualifiers		_ 3
GC/MS VOA		
Qualifier	Qualifier Description	4
U	Indicates the analyte was analyzed for but not detected.	_
Glossary		- 5
Abbreviation	These commonly used abbreviations may or may not be present in this report.	- 6
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis	_ 0
%R	Percent Recovery	7
CFL	Contains Free Liquid	
CFU	Colony Forming Unit	0
CNF	Contains No Free Liquid	0
DER	Duplicate Error Ratio (normalized absolute difference)	
Dil Fac	Dilution Factor	9
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	10
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

#### Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative 240-159510-1

**Case Narrative** 

#### Comments

No additional comments.

#### Receipt

The samples were received on 11/6/2021 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 1.1° C.

#### GC/MS VOA

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

#### VOA Prep

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

Job ID: 240-159510-1

## **Method Summary**

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

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

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-159510-1	TRIP BLANK_08	Water	11/03/21 00:00	11/06/21 08:00
240-159510-2	MW-184S_110321	Water	11/03/21 10:00	11/06/21 08:00

<b>Detection Sur</b>	nmary
----------------------	-------

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

Client Sample ID: TRIP BLANK\_08

No Detections.

## Client Sample ID: MW-184S\_110321

No Detections.

Lab Sample ID: 240-159510-2

Lab Sample ID: 240-159510-1

This Detection Summary does not include radiochemical test results.

## Client Sample ID: TRIP BLANK\_08 Date Collected: 11/03/21 00:00 Date Received: 11/06/21 08:00

## Job ID: 240-159510-1

## Lab Sample ID: 240-159510-1 Matrix: Water

5 6 7

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 20:59	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 20:59	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 20:59	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 20:59	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 20:59	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 20:59	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	98		62 - 137					11/13/21 20:59	1
4-Bromofluorobenzene (Surr)	79		56 - 136					11/13/21 20:59	1
Toluene-d8 (Surr)	109		78 - 122					11/13/21 20:59	1
Dibromofluoromethane (Surr)	96		73 - 120					11/13/21 20:59	1

## Client Sample ID: MW-184S\_110321 Date Collected: 11/03/21 10:00 Date Received: 11/06/21 08:00

Job	ID:	240-1595	10-1
-----	-----	----------	------

## Lab Sample ID: 240-159510-2 Matrix: Water

Vater

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/12/21 00:38	1	ŝ
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac	
1,2-Dichloroethane-d4 (Surr)	82		66 - 120			-		11/12/21 00:38	1	
Method: 8260B - Volatile O	rganic Compo	unds (GC/	MS)							ŝ
Analyte	· ·	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac	
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 21:22	1	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 21:22	1	
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 21:22	1	
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 21:22	1	
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 21:22	1	
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 21:22	1	
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac	
1,2-Dichloroethane-d4 (Surr)			62 - 137			-		11/13/21 21:22	1	
4-Bromofluorobenzene (Surr)	81		56 - 136					11/13/21 21:22	1	1
Toluene-d8 (Surr)	111		78 - 122					11/13/21 21:22	1	
Dibromofluoromethane (Surr)	102		73 - 120					11/13/21 21:22	1	÷,

11/22/2021

## **Surrogate Summary**

Lab Sample ID

240-159510-1

240-159510-2

Matrix: Water

LCS 240-512817/4

MB 240-512817/6

240-159418-E-2 MS

240-159418-L-2 MSD

## Method: 8260B - Volatile Organic Compounds (GC/MS) **Matrix: Water**

Prep Type: Total/NA Percent Surrogate Recovery (Acceptance Limits) DCA BFB DBFM TOL (62-137) (73-120) **Client Sample ID** (56-136) (78-122) Matrix Spike 94 93 87 106 Matrix Spike Duplicate 87 91 90 107 TRIP BLANK 08 98 79 109 96 MW-184S 110321 103 81 102 111 Lab Control Sample 90 89 112 90 Method Blank 98 81 112 98 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) Prep Type: Total/NA Limita) Percent Surrogate Percevery (Acceptance

			Percent Surrogate Recovery (Acceptance Limits)	
		DCA		13
Lab Sample ID	Client Sample ID	(66-120)		
240-159418-H-2 MS	Matrix Spike	82		
240-159418-P-2 MSD	Matrix Spike Duplicate	83		
240-159510-2	MW-184S_110321	82		
LCS 240-512585/4	Lab Control Sample	81		
MB 240-512585/5	Method Blank	84		
Surrogate Legend				

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

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

## Lab Sample ID: MB 240-512817/6 Matrix: Water

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

Job ID: 240-159510-1

Analysis Batch: 512817 MB MB Analyte **Result Qualifier** RL MDL Unit Prepared Analyzed Dil Fac D 1,1-Dichloroethene 1.0 U 1.0 0.49 ug/L 11/13/21 13:55 cis-1,2-Dichloroethene 1.0 U 1.0 0.46 ug/L 11/13/21 13:55 Tetrachloroethene 1.0 U 0.44 ug/L 1.0 11/13/21 13:55 trans-1,2-Dichloroethene 1.0 U 1.0 0.51 ug/L 11/13/21 13:55 Trichloroethene 1.0 U 1.0 0.44 ug/L 11/13/21 13:55 1 Vinyl chloride 1.0 U 1.0 0.45 ug/L 11/13/21 13:55 1

	МВ	МВ				
Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	98		62 - 137		11/13/21 13:55	1
4-Bromofluorobenzene (Surr)	81		56 - 136		11/13/21 13:55	1
Toluene-d8 (Surr)	112		78 - 122		11/13/21 13:55	1
Dibromofluoromethane (Surr)	98		73 - 120		11/13/21 13:55	1

### Lab Sample ID: LCS 240-512817/4 Matrix: Water Analysis Batch: 512817

	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
1,1-Dichloroethene	10.0	10.9		ug/L		109	63 - 134	
cis-1,2-Dichloroethene	10.0	10.3		ug/L		103	77 - 123	
Tetrachloroethene	10.0	11.9		ug/L		119	76 - 123	
trans-1,2-Dichloroethene	10.0	10.8		ug/L		108	75 - 124	
Trichloroethene	10.0	9.19		ug/L		92	70 - 122	
Vinyl chloride	10.0	9.48		ug/L		95	60 - 144	

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	90		62 - 137
4-Bromofluorobenzene (Surr)	89		56 - 136
Toluene-d8 (Surr)	112		78 - 122
Dibromofluoromethane (Surr)	90		73 - 120

106

### Lab Sample ID: 240-159418-E-2 MS Matrix: Water Analysis Batch: 512817

Toluene-d8 (Surr)

	Sample	Sample	Spike	MS	MS				%Rec.
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits
1,1-Dichloroethene	1.0	U	10.0	10.3		ug/L		103	56 - 135
cis-1,2-Dichloroethene	1.0	U	10.0	9.89		ug/L		99	66 - 128
Tetrachloroethene	1.0	U	10.0	9.53		ug/L		95	62 - 131
trans-1,2-Dichloroethene	1.0	U	10.0	9.91		ug/L		99	56 - 136
Trichloroethene	1.0	U	10.0	8.16		ug/L		82	61 - 124
Vinyl chloride	1.0	U	10.0	9.96		ug/L		100	43 - 157
	MS	MS							
Surrogate	%Recovery	Qualifier	Limits						
1,2-Dichloroethane-d4 (Surr)	93		62 - 137						
4-Bromofluorobenzene (Surr)	87		56 - 136						

## Prep Type: Total/NA

**Client Sample ID: Lab Control Sample** 

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

Eurofins TestAmerica, Canton

10

78 - 122

## **QC Sample Results**

Job ID: 240-159510-1

10

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

Matrix: Water	18-E-2 MS									-	u u	mple ID: Prep Ty		
Analysis Batch: 512817														
	MS	MS												
Surrogate	%Recovery	Qua	lifier	Limits										
Dibromofluoromethane (Surr)	94			73 - 120										
Lab Sample ID: 240-1594 Matrix: Water	18-L-2 MSD							Client	t San	npl	le ID: N	latrix Spi Prep Ty		
Analysis Batch: 512817														
-	Sample	Sam	ple	Spike	M	SD	MSD					%Rec.		RP
Analyte	Result	Qua	lifier	Added	Res	ult	Qualifier	Unit		D	%Rec	Limits	RPD	Lin
1,1-Dichloroethene	1.0	U		10.0	1(	0.0		ug/L		_	100	56 - 135	2	2
cis-1,2-Dichloroethene	1.0	U		10.0	1(	).1		ug/L			101	66 - 128	2	
Tetrachloroethene	1.0	U		10.0	1(	).1		ug/L			101	62 - 131	5	
trans-1,2-Dichloroethene	1.0	U		10.0	1(	).1		ug/L			101	56 - 136	2	
Trichloroethene	1.0			10.0		61		ug/L			86	61 - 124	5	
Vinyl chloride	1.0			10.0		).2		ug/L			102	43 - 157	3	
,		-											0	-
	MSD													
Surrogate	%Recovery	Qua	lifier	Limits										
1,2-Dichloroethane-d4 (Surr)	90			62 - 137										
4-Bromofluorobenzene (Surr)	87			56 - 136										
Toluene-d8 (Surr)	107			78_122										
Dibromofluoromethane (Surr)	91			73 - 120										
Aethod: 8260B SIM - Lab Sample ID: MB 240-8 Matrix: Water		gan	ic Com	pound	s (GC/	MS	5)		С	lie	nt Sam	nple ID: M Prep Ty		
Lab Sample ID: MB 240-5 Matrix: Water				pound	s (GC/	MS	5)		С	lie	nt Sam			
Lab Sample ID: MB 240-{ Matrix: Water Analysis Batch: 512585	512585/5	мв	МВ	npound								Prep Ty	/pe: To	otal/N
Lab Sample ID: MB 240-8 Matrix: Water Analysis Batch: 512585 Analyte	512585/5	MB	MB Qualifier	ipound	RL	M	IDL Unit		C		nt Sam	Prep Ty Analy	/pe: To	otal/N
Lab Sample ID: MB 240-8 Matrix: Water Analysis Batch: 512585 Analyte	512585/5	MB esult 2.0	MB Qualifier U	npound		M						Prep Ty	/pe: To	otal/N
Lab Sample ID: MB 240-8 Matrix: Water Analysis Batch: 512585 Analyte 1,4-Dioxane	512585/5	MB esult 2.0 MB	MB Qualifier U		<b>RL</b>	M	IDL Unit			Pr	epared	Prep Ty <u>Analy</u> 	<b>vpe: To</b> vzed 19:04	Dil F
Lab Sample ID: MB 240-5 Matrix: Water Analysis Batch: 512585 Analyte 1,4-Dioxane Surrogate	512585/5	MB esult 2.0 MB very	MB Qualifier U		RL	M	IDL Unit			Pr		Prep Ty 	<b>vpe: To</b> vzed 19:04 vzed	Dil F
Lab Sample ID: MB 240-5 Matrix: Water Analysis Batch: 512585 Analyte 1,4-Dioxane Surrogate	512585/5	MB esult 2.0 MB	MB Qualifier U		RL	M	IDL Unit			Pr	epared	Prep Ty <u>Analy</u> 	<b>vpe: To</b> vzed 19:04 vzed	Dil Fa
Lab Sample ID: MB 240-8 Matrix: Water Analysis Batch: 512585 Analyte 1,4-Dioxane Surrogate 1,2-Dichloroethane-d4 (Surr) Lab Sample ID: LCS 240	512585/5 Re 	MB esult 2.0 MB very	MB Qualifier U		RL	M	IDL Unit	Clie	<b>D</b>	Pr Pr	repared repared	Prep Ty 	rpe: To rzed 19:04 rzed 19:04 ntrol S	Dil Fail/N Dil Fa Dil Fa
Lab Sample ID: MB 240-8 Matrix: Water Analysis Batch: 512585 Analyte 1,4-Dioxane Surrogate 1,2-Dichloroethane-d4 (Surr) Lab Sample ID: LCS 240 Matrix: Water	512585/5 Re 	MB esult 2.0 MB very	MB Qualifier U	<u>Limi</u> 66 - 1	RL	M	IDL Unit	Clie	<b>D</b>	Pr Pr	repared repared	Prep Ty 	rpe: To rzed 19:04 rzed 19:04 ntrol S	Dil Fail/N Dil Fa Dil Fa
Lab Sample ID: MB 240-8 Matrix: Water Analysis Batch: 512585 Analyte 1,4-Dioxane Surrogate 1,2-Dichloroethane-d4 (Surr) Lab Sample ID: LCS 240 Matrix: Water	512585/5 Re 	MB esult 2.0 MB very	MB Qualifier U		RL 2.0 ts 120	<b>M</b> 0	IDL Unit	Clie	<b>D</b>	Pr Pr	repared repared	Prep Ty 	rpe: To rzed 19:04 rzed 19:04 ntrol S	Dil Fa
Lab Sample ID: MB 240-5 Matrix: Water Analysis Batch: 512585 Analyte 1,4-Dioxane Surrogate 1,2-Dichloroethane-d4 (Surr) Lab Sample ID: LCS 240- Matrix: Water Analysis Batch: 512585 Analyte	512585/5 Re 	MB esult 2.0 MB very	MB Qualifier U	Limi 66 - 1 Spike Added	RL 2.0 120 Lu Res	M 0 CS ult	IDL Unit ).86 ug/L	Clic	<u> </u>	Pr Pr	repared repared nple ID	Analy           4naly           11/11/21           Analy           11/11/21           Lab Coor           Prep Ty           %Rec.           Limits	rpe: To rzed 19:04 rzed 19:04 ntrol S	Dil Fa
Lab Sample ID: MB 240-5 Matrix: Water Analysis Batch: 512585 Analyte 1,4-Dioxane Surrogate 1,2-Dichloroethane-d4 (Surr) Lab Sample ID: LCS 240 Matrix: Water Analysis Batch: 512585	512585/5 Re 	MB esult 2.0 MB very	MB Qualifier U	<i>Limi</i> 66 - 1 Spike	RL 2.0 120 Lu Res	<u>м</u> 0	IDL Unit D.86 ug/L		<u> </u>	Pr Pr	repared repared nple ID	Prep Ty Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Analy Anal	rpe: To rzed 19:04 rzed 19:04 ntrol S	Dil Fa
Lab Sample ID: MB 240-5 Matrix: Water Analysis Batch: 512585 Analyte 1,4-Dioxane Surrogate 1,2-Dichloroethane-d4 (Surr) Lab Sample ID: LCS 240- Matrix: Water Analysis Batch: 512585 Analyte	512585/5 Re 	MB esult 2.0 MB very 84	MB Qualifier U MB Qualifier	Limi 66 - 1 Spike Added	RL 2.0 120 Lu Res	M 0 CS ult	IDL Unit D.86 ug/L	Unit	<u> </u>	Pr Pr	repared repared nple ID	Analy           4naly           11/11/21           Analy           11/11/21           Lab Coor           Prep Ty           %Rec.           Limits	rpe: To rzed 19:04 rzed 19:04 ntrol S	Dil Fa
Lab Sample ID: MB 240-8 Matrix: Water Analysis Batch: 512585 Analyte 1,4-Dioxane Surrogate 1,2-Dichloroethane-d4 (Surr) Lab Sample ID: LCS 240- Matrix: Water Analysis Batch: 512585 Analyte 1,4-Dioxane	512585/5 	MB esult 2.0 MB very 84	MB Qualifier U MB Qualifier	<u>Limi</u> 66 - 1  Spike 	RL 2.0 120 Lu Res	M 0 CS ult	IDL Unit D.86 ug/L	Unit	<u> </u>	Pr Pr	repared repared nple ID	Analy           4naly           11/11/21           Analy           11/11/21           Lab Coor           Prep Ty           %Rec.           Limits	rpe: To rzed 19:04 rzed 19:04 ntrol S	Dil Fa
Lab Sample ID: MB 240-8 Matrix: Water Analysis Batch: 512585 Analyte 1,4-Dioxane <i>Surrogate</i> 1,2-Dichloroethane-d4 (Surr) Lab Sample ID: LCS 240- Matrix: Water Analysis Batch: 512585 Analyte 1,4-Dioxane Surrogate	512585/5 	MB esult 2.0 MB very 84	MB Qualifier U MB Qualifier	Limi 66 - 1 Spike Added	RL 2.0 120 Lu Res	M 0 CS ult	IDL Unit D.86 ug/L	Unit	<u> </u>	Pr Pr	repared repared nple ID	Analy           4naly           11/11/21           Analy           11/11/21           Lab Coor           Prep Ty           %Rec.           Limits	rpe: To rzed 19:04 rzed 19:04 ntrol S	Dil Fail/N Dil Fa Dil Fa
Lab Sample ID: MB 240-8 Matrix: Water Analysis Batch: 512585 Analyte 1,4-Dioxane <i>Surrogate</i> 1,2-Dichloroethane-d4 (Surr) Lab Sample ID: LCS 240- Matrix: Water Analysis Batch: 512585 Analyte 1,4-Dioxane <i>Surrogate</i> 1,2-Dichloroethane-d4 (Surr)	512585/5 Recor -512585/4  LCS %Recovery 81	MB esult 2.0 MB very 84	MB Qualifier U MB Qualifier	Limit Spike Added 10.0	RL 2.0 120 Lu Res	M 0 CS ult	IDL Unit D.86 ug/L	Unit	D	Pr Pr San	repared nple ID <u>%Rec</u> 99	Prep Ty <u>Analy</u> 11/11/21 <u>Analy</u> 11/11/21 Lab Col Prep Ty %Rec. Limits 80 - 122	72ed 19:04 72ed 19:04 19:04 ntrol S 7pe: To	Dil Fa Dil Fa Dil Fa
Lab Sample ID: MB 240-8 Matrix: Water Analysis Batch: 512585 Analyte 1,4-Dioxane <i>Surrogate</i> 1,2-Dichloroethane-d4 (Surr) Lab Sample ID: LCS 240- Matrix: Water Analysis Batch: 512585 Analyte 1,4-Dioxane <i>Surrogate</i> 1,2-Dichloroethane-d4 (Surr) Lab Sample ID: 240-1594	512585/5 Recor -512585/4  LCS %Recovery 81	MB esult 2.0 MB very 84	MB Qualifier U MB Qualifier	Limit Spike Added 10.0	RL 2.0 120 Lu Res	M 0 CS ult	IDL Unit D.86 ug/L	Unit	D	Pr Pr San	repared nple ID <u>%Rec</u> 99	Analy           4naly           11/11/21           Analy           11/11/21           Lab Coor           Prep Ty           %Rec.           Limits	rpe: To rzed 19:04 /rzed 19:04 ntrol S rpe: To Matrix	Dil Fa Dil Fa Dil Fa Samp otal/N
Lab Sample ID: MB 240-8 Matrix: Water Analysis Batch: 512585 Analyte 1,4-Dioxane <i>Surrogate</i> 1,2-Dichloroethane-d4 (Surr) Lab Sample ID: LCS 240- Matrix: Water Analysis Batch: 512585 Analyte 1,4-Dioxane <i>Surrogate</i> 1,2-Dichloroethane-d4 (Surr) Lab Sample ID: 240-1594 Matrix: Water	512585/5 	MB esult 2.0 MB very 84	MB Qualifier U MB Qualifier		RL 2.0 120 Lu Res 9.	M 0 2 3 4 1 1 8 6	IDL Unit 0.86 ug/L LCS Qualifier	Unit	D	Pr Pr San	repared nple ID <u>%Rec</u> 99	Analy           11/11/21           Analy           11/11/21           Analy           11/11/21           Lab Cor           Prep Ty           %Rec.           Limits           80 - 122           mple ID:           Prep Ty	rpe: To rzed 19:04 /rzed 19:04 ntrol S rpe: To Matrix	Dil Fa Dil Fa Dil Fa Samplotal/N
Lab Sample ID: MB 240-	512585/5 	MB esult 2.0 MB very 84	MB Qualifier U MB Qualifier	Limit Spike Added 10.0	RL 2.0 120 Lu Res 9.	M 0 CS ult	IDL Unit 0.86 ug/L LCS Qualifier	Unit	D	Pr Pr San	repared nple ID <u>%Rec</u> 99	Prep Ty 	rpe: To rzed 19:04 /rzed 19:04 ntrol S rpe: To Matrix	Dil Fa Dil Fa Dil Fa Sampl otal/N
Lab Sample ID: MB 240-8 Matrix: Water Analysis Batch: 512585 Analyte 1,4-Dioxane <i>Surrogate</i> 1,2-Dichloroethane-d4 (Surr) Lab Sample ID: LCS 240- Matrix: Water Analysis Batch: 512585 Analyte 1,4-Dioxane <i>Surrogate</i> 1,2-Dichloroethane-d4 (Surr) Lab Sample ID: 240-1594 Matrix: Water	512585/5 	MB esult 2.0 MB very 84 LCS Qua	MB Qualifier U <i>MB</i> <i>Qualifier</i>		RL 2.0 ts 120 L( Res 9.	M 0 2 3 3 4 1 1 8 6	IDL Unit 0.86 ug/L LCS Qualifier	Unit	D	Pr Pr San	repared nple ID <u>%Rec</u> 99	Analy           11/11/21           Analy           11/11/21           Analy           11/11/21           Lab Cor           Prep Ty           %Rec.           Limits           80 - 122           mple ID:           Prep Ty	rpe: To rzed 19:04 /rzed 19:04 ntrol S rpe: To Matrix	Dil Fa Dil Fa Dil Fa Sampl otal/N

Eurofins TestAmerica, Canton

Job ID: 240-159510-1

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

		MS										
Surrogate	%Recovery	Qualifier	Limits									
1,2-Dichloroethane-d4 (Surr)	82		66 - 120									5
Lab Sample ID: 240-1594	18-P-2 MSD					Client	Samp	le ID: N	latrix Spil	ke Dup	licate	
Matrix: Water									Prep Ty	pe: Tot	al/NA	
Analysis Batch: 512585												
	Sample	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	10.2		ug/L		102	51 - 153	8	16	8
	MSD	MSD										
Surrogate	%Recovery	Qualifier	Limits									9
1,2-Dichloroethane-d4 (Surr)	83		66 - 120									
												10

Eurofins TestAmerica, Canton

## **QC** Association Summary

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

## **GC/MS VOA**

## Analysis Batch: 512585

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159510-2	MW-184S_110321	Total/NA	Water	8260B SIM	
MB 240-512585/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-512585/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-159418-H-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-159418-P-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-159510-1	TRIP BLANK_08	Total/NA	Water	8260B	
240-159510-2	MW-184S_110321	Total/NA	Water	8260B	
MB 240-512817/6	Method Blank	Total/NA	Water	8260B	
LCS 240-512817/4	Lab Control Sample	Total/NA	Water	8260B	
240-159418-E-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-159418-L-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Job ID: 240-159510-1

Matrix: Water

Lab Sample ID: 240-159510-1

## Client Sample ID: TRIP BLANK\_08 Date Collected: 11/03/21 00:00 Date Received: 11/06/21 08:00

_	Batch	Batch		Dilution	Batch	Prepared		
Prep Туре	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	512817	11/13/21 20:59	LEE	TAL CAN
Client Samp	ole ID: MW	/-184S_110321					Lab Sa	ample ID
- Date Collected	d: 11/03/21 1	0:00						
Date Received	d: 11/06/21 0	8:00						
_	Batch	Batch		Dilution	Batch	Prepared		
Pron Type	Type	Method	Run	Factor	Number	or Analyzod	Analyst	l ah

	Baton	Baton		Bildtion	Baton	Troparoa			
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab	
Total/NA	Analysis	8260B		1	512817	11/13/21 21:22	LEE	TAL CAN	
Total/NA	Analysis	8260B SIM		1	512585	11/12/21 00:38	CS	TAL CAN	

### Laboratory References:

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

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

## Job ID: 240-159510-1

## 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	06-30-22	
Georgia	State	4062	02-23-22	
Illinois	NELAP	200004	07-31-22	
lowa	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	
∕irginia	NELAP	11570	09-14-22	
Washington	State	C971	01-12-22	
West Virginia DEP	State	210	12-31-21	

Control         Control <t< th=""><th>170</th><th>TestAmerica Laboratory location: Brighton 10448 Cit</th><th>Ottation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763</th><th>9-2763</th><th></th></t<>	170	TestAmerica Laboratory location: Brighton 10448 Cit	Ottation Drive, Suite 200 / Brighton, MI 48116 / 810-229-2763	9-2763	
Construction         Construction         Construction         Construction         Account Net Ableboa           Construction         Construction <th>Client Contact</th> <th>ł</th> <th>RCRA</th> <th></th> <th></th>	Client Contact	ł	RCRA		
Motion:::::::::::::::::::::::::::::::::::	Company Name: Arcadis	Climet Panjaré Mananan Krite Elization.	Current III M.C.R.		TestAmerica Laboratories, Inc.
Conference (Laboration)         Conference (Laboration)         Tendone: Laboration)         Tendone: Laboration)         Tendone: Laboration)         Conference (Laboration)	Address: 28550 Cabot Drive, Suite 500		SHE CONTACT: Julia MICULATIENTY	Lab Contact: Mike DeiMonico	COC No:
320         Dati Mundrehimengianetian         Antiyati         Antiyat	City/State/Zip: Novi, MI, 48377	Telephone: 248-994-2240	Telephone: 734-644-5131	Telephone: 330-497-9396	
При на	Phone: 742.004.7740	Email: kristoffer.hinskey@arcadis.com	Analysis I urnaround I ime	Analyses	
При Иники: завидат         0.64         2 - вод ставит         0.64         2 - вод ставит         1 - вод         1 - вод <td>Project Name: Ford LTP Off-Site</td> <td></td> <td>TAT if different from below 3 weeks</td> <td></td> <td>Walk-in client</td>	Project Name: Ford LTP Off-Site		TAT if different from below 3 weeks		Walk-in client
ОТ Замосла (ДСС)         Вородутитации         Полона	Project Number: 30080642.402.04	Method of Shipmeat/Carrier:	<ul> <li>2 weeks</li> <li>1 week</li> </ul>		Lab sampling
Report Information         Report Reported and a point         Report	PO# 30080642.402.04	Shipping/Tracking No:	Grab.	8260B 5 8260B 5 8260B	Job/SDG No:
Barery iteration         Same		Matrix	Containers & Preservatives 	CP(0496 35608 85608 1'5-DCE 5-DCE 83	Samule Secerific Notes /
TRP BLANK OF        -       X       1       N (C X X X X X X X X X 000 F000 F000 F000 F	Sample Identification	Sample Time Saild Adree Sedima	Com Ellier Unbre Keolf Keolf Keolf Keolf HROJ	Aluyl d TCE 8 PCE 8 Trans	Special Instructions:
Friedure     Mile		x	0	X X X X X X	1 Trip Blank
Image: Second	mw-1845_1103	21 1000	NG	X X X X	3 VOAs for 8260B 3 VOAs for 8260B SIM
Image: Second					
Image: Second					
Identification     200-159510 Chain of Custody       Identification					
International International and learning and learning					
Identification     Identification       and     "atmable       and     "atmable       and     "atmable       internet     Poison B       totact Requirements & Comment:     Rem to be seesed framples are realised longer than 1 month)       the through Cadena art formalis@cadenace.com. Cadena #E203631       the through Cadena art formalis@cadenace.com.cadena #E203631			240-159510 Chain of C	ustody	
rd Identification rd Identification and Talamable cin Initiant Poison B Unknown Sample Disposal (A fee may be assessed if amples are retained longer than 1 month) nois/OC Requirements & Comments: ins through Cadena at Idonania@eaden accoom. Cadena #E203631 ting requested. MMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMMM					
Indication     Contraction     Sample Separal (A fee may be accessed if samples are retained longer than 1 month)       Instruction     Comments & Comments     Comments     Comments       Instruction     Return to Clicin     V Disposal ByLab     Archive For T     Months       Instruction     Company:     Return to Clicin     V Disposal ByLab     Archive For T     Months       Instruction     Company:     Disposal ByLab     Archive For T     Months     Disposal ByLab     Archive For T     Disposal ByLab       Instruction     Company:     Disposal ByLab     Archive For T     Disposal ByLab     Archive For T     Disposal ByLab       Instruction     Company:     Disposal ByLab     Archive For T     Disposal ByLab     Archive For T     Disposal ByLab       Instruments     Company:     Disposal ByLab     Archive For T     Disposal ByLab     Archive For T     Disposal ByLab       Instruments     Company:     Disposal ByLab     Archive For T     Disposal ByLab     Archive For T     Disposal ByLab       Instruments     Company:     Company:     Conspany:     Disposal ByLab     Archive For T     Disposal ByLab       Instruments     Company:     Company:     Company:     Company:     Disposal ByLab     Archive For T       Instruments     Disposal ByLab <td>Breedship is the second of the second on</td> <td></td> <td></td> <td></td> <td></td>	Breedship is the second of the second on				
its through Cadena at Jonnalia@cadenaco.com. Cadena #203631 ting requested. Why Mine Mine Mine Mine Mine Mine Mine Mine		Poison B	Sample Disposal ( A fee may be assessed if san Return to Client V Disposal By La	nples are retained longer than 1 month) b Archive For Months	
WW Company: Company: Date/Time: 1/500 Received by: Cold 57 of age Company: Date/Time: 150 North AULL Company: Date/Time: 11/4/21/1500 N.O.V. Cold 57 of age Official is Date/Time: Date/Time: 150 North AULL Company: Date/Time: 1446 Received by: Company: Company: Date/Time: Date/Time: 1460 ETA 11/5/21/14	Submit all results through Cadena at jtomalia@caden Level IV Reporting requested.	naco.com. Cedena #E203631			
North AUL Compary Descriment AUL Compary Descriment AUL Company and AUL Company Descriment AUL Company AUL Company Descriment AUL Company AUR C	Relinquished by	Date/Time:	Received by:	Company:	1
Let Hele Company the Company of Company of Company of ETA Date Date The Date The Date The Company of ETA 11/6/21 8	Relinquished by Martin A WW	Date/Time:	Received by:	Company:	1421
		Date Tune:	Received in Laboratory by:	4 4	(1) X
	Store Tentometers Latoreteres, Inc. Al registo reserved.				2

ø

Ø

MICHIGAN

Eurofins TestAmerica Canton Sample Receipt Form/Narrative Canton Facility	Login # :
Client $AR(ADIS$ Site Name	Cooler unpacked by:
Cooler Received on $11/6/21$ Opened on $11/6/21$	Mutthey Swra
FedEx: 1 <sup>st</sup> Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier	
Receipt After-hours: Drop-off Date/Time Storage Location	
TestAmerica Cooler # TA 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	
IR GUN# IR-14 (CF +0.1 °C) Observed Cooler Temp. <u>C</u> °C Corrected Cooler IR GUN #IR-15 (CF +0.2 °C) Observed Cooler Temp. °C Corrected Cooler	
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity	
-Were the seals on the outside of the cooler(s) signed & dated?	No NA Tests that are not
	es No Receiving:
	No NA
3. Shippers' packing slip attached to the cooler(s)? Ye	es No VOAs
	No Oil and Grease
	es No
	No
	No
<ul> <li>Could all bottle labels (ID/Date/Time) be reconciled with the COC?</li> <li>For each sample, does the COC specify preservatives (NN), # of containers (NN), and so the COC specify preservatives (NN), # of containers (NN), and so the COC specify preservatives (NN), # of containers (NN), and so the COC specify preservatives (NN), # of containers (NN), and so the COC specify preservatives (NN), # of containers (NN), and so the COC specify preservatives (NN), # of containers (NN), and so the COC specify preservatives (NN), # of containers (NN), and so the COC specify preservatives (NN), # of containers (NN), and so the COC specify preservatives (NN), # of containers (NN), and so the COC specify preservatives (NN), # of containers (NN), and so the COC specify preservatives (NN), # of containers (NN), and so the COC specify preservatives (NN), # of containers (NN), and so the COC specify preservatives (NN), # of containers (NN), and so the COC specify preservatives (NN), # of containers (NN), # of containers</li></ul>	b) No
	sample type of grad/comp (1914)?
	s) No
	es No
If yes, Questions 13-17 have been checked at the originating laboratory.	
	es No (NA) pH Strip Lot# HC157842
	s) No
5. Were air bubbles >6 mm in any VOA vials? 🛑 🖕 Larger than this. Ye	es 10 NA
	s No
7. Was a LL Hg or Me Hg trip blank present? Ye	es No
ontacted PM by via Verbal V	Voice Mail Other
Concerning	6 Ø
8. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES additional next page	
<b>B. CHAIN OF CUSTODY &amp; SAMPLE DISCREPANCIES</b> additional next page	Samples processed by:
9. SAMPLE CONDITION	
ample(s) were received after the recommended hold	
ample(s)	d in a broken container.
ample(s) were received after the recommended hold	d in a broken container.
ample(s)	d in a broken container.
ample(s)	d in a broken container.
ample(s)	d in a broken container. in diameter. (Notify PM)
ample(s)	d in a broken container.
ample(s)      were received after the recommended hold         ample(s)      were received         ample(s)      were received with bubble >6 mm         0. SAMPLE PRESERVATION	d in a broken container. in diameter. (Notify PM) rther preserved in the laboratory.

1

## **DATA VERIFICATION REPORT**



November 22, 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 OFF-SITE GW Event Specific Scope of Work References: Sample COC Laboratory: TestAmerica - North Canton Laboratory submittal: 159510-1 Sample date: 2021-11-03 Report received by CADENA: 2021-11-22 Initial Data Verification completed by CADENA: 2021-11-22 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.

There were no significant QC anomalies or exceptions to report.

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 <u>http://clms.cadenaco.com/index.cfm</u>.

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.
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

CADENA Project ID: E203631 Laboratory: TestAmerica - North Canton Laboratory Submittal: 159510-1

		Sample Name: Lab Sample ID: Sample Date:	Lab Sample ID: 2401595101							
				Report		Valid		Report		Valid
	Analyte	Cas No.	Result	Limit	Units	Qualifier	Result	Limit	Units	Qualifier
GC/MS VOC										
<u>OSW-8260</u>	<u>)B</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-8260</u>	)BBSim									
	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 # 240-159510-1 CADENA Verification Report: 2021-11-22

Analyses Performed By: TestAmerica North Canton, Ohio

Report # 43664R Review Level: Tier III Project: 30080642.402.04

## **SUMMARY**

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-159510-1 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_08	240-159510-1	Water	11/03/21		Х			
-	MW-184S_110321	240-159510-2	Water	11/03/21		Х	Х		

## ANALYTICAL DATA PACKAGE DOCUMENTATION

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

Items Reviewed	Rep	orted		mance ptable	Not
	No	Yes	No	Yes	Required
1. Sample receipt condition		Х		Х	
2. Requested analyses and sample results		Х		Х	
3. 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	
9. Sample preparation/extraction/analysis dates		Х		Х	
10. Fully executed Chain-of-Custody (COC) form		Х		Х	
11. 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.

### 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 VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Rep	orted		rmance ptable	Not	
	No	Yes	No	Yes	Required	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (G	C/MS)		•			
Tier II Validation						
Holding times/Preservation		Х		X		
Tier III Validation		1			1	
System performance and column resolution		Х		X		
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		Х		X		
E. Reporting limits adjusted to reflect sample dilutions		Х		Х		
Notes:						

<u>Notes:</u>

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

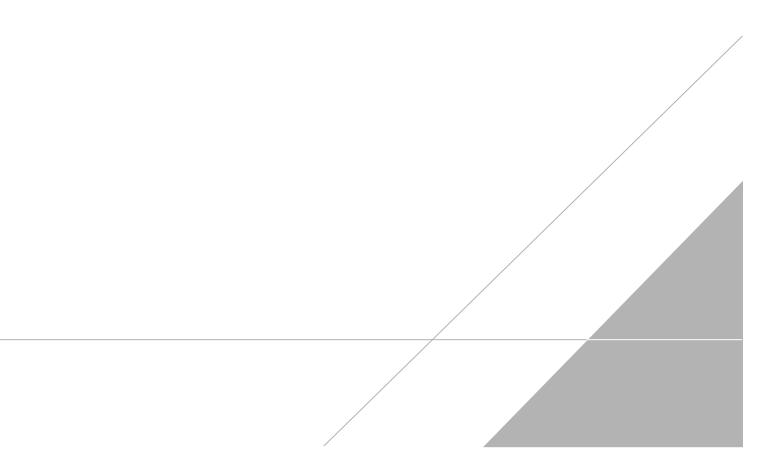
VALIDATION PERFORMED BY:	Hrishikesh Upadhyaya
SIGNATURE:	Curielielued

DATE: December 09, 2021

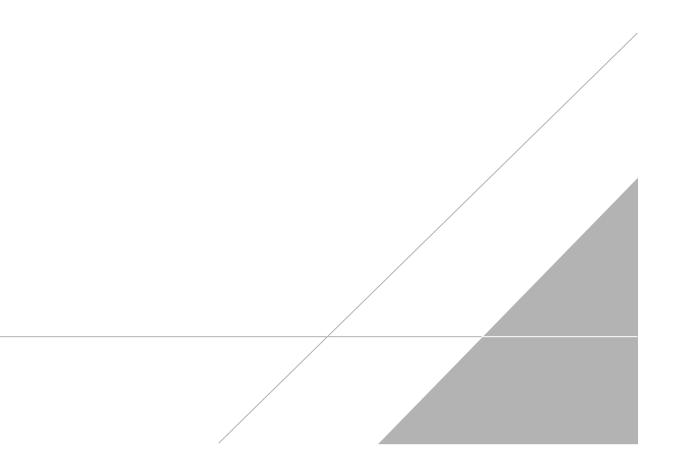
PEER REVIEW: Andrew Korycinski

DATE: December 09, 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, MI 48116 / 810-229-2763

ompany Name: Arcadis		tory program:			D	w	-	NP	DES		- 1	RCR	A		Other								_				
																1											TestAmerica Laboratorie
ddress: 28550 Cabot Drive, Suite 500	Client Project !	Manager: Kris I	Hinske	y			Site	e Cor	itact:	: Juli	a McC	laff	erty				Lab (	onta	ct: Mi	ke De	Mon	onico CC		COC No:			
	Telephone: 248	-994-2240					Telephone: 734-644-5131 Telephone: 330-497-9396																				
ity/State/Zip: Novi, MI, 48377								Analysis Turnaround Time												1 of 1 COCs							
hone: 248-994-2240	Email: kristoff	er.hinskey@arc	cadis.c	om			F	Ana	lysis	lun	aroun		me					_	1	- 1	Analy	ses				-	For lab use only
	Sampler Name	s					TA	Tifd	fferent	from																	Walk-in client
roject Name: Ford LTP Off-Site	Set	n Turi	na					10 d		1	3 wee																
roject Number: 30080642.402.04	Method of Ship				-			10 0	ау		1 wee			-	0								s				Lab sampling
0 # 30080642.402.04	Shipping/Track	dan No.					-				2 day		- 1	N	P.			608			8						
	Suppling Track	and san:									I day			le O	-Gr	0	260	E 82			826						Job/SDG No:
				N	latri		T	Co	ataine	ers &	Preser	vativ	8	amp	Ŷ	280	8	Q	0	0	de	1					A ment of the state of the
				5	Ē		1.						.	spa	osit	พิโ	2-D	-1,2	3280	3260	- Per		RX0				Sample Spocific Notes
Sample Identification	Sample Date	Sample Time	۶Ľ	Aqueo	Sediment	Other:	H2SO4	HN03	HCI	HOH	NaOII	adu	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 82608	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	·   !	1,4-DIUX8INB 020UD				Special Instructions:
							÷	-	-	12		-				-		_	1	1	1	+	62		+		
				X					1					N	G	X	Х	Х	X	X	X	1	٩¥	1			1 Trip Blank
mW-1845_110321	11/3/21	1000		X					6					N	G	X	X	Y	X	X	X		X				3 VOAs for 8260B 3 VOAs for 8260B S
		-														Т						Τ	T				
			$\vdash$	-	+		╇	+		-	$\vdash$	$\dashv$			$\vdash$		-			-	-	+	+	$\rightarrow$	<u> </u>	-	
				+	+	-	+	+	-	$\vdash$		-							+	+	+	+	+	+-	+-	+	
																						1					
											100		il <b>n</b> state and						1	T	T	Т	Т				
			$\vdash$	-	+		+	┢	-	+													+	-	+		
				+	+		+	+	+	+													+	+	+		
											240	-15	9510 C	Cha	in of	Cus											
				T	T		T	Τ		Г						ous	siouy	-		_	_		+		-	1	
			$\vdash$	+	_	<u> </u>	—	-			$\square$	-			$ \rightarrow $		_									-	
													- 1														
Possible Hazard Identification				_				Same	le Di	5005		lee m	ay be as	55015	ed if a	mol	-	reta	ined I		then	1 m	nth)				
Von-Hazard Vlammable cin	Irritant Poiso	n B	Unkno	nwo				-	Retu	im to	Client		- Di	spos	al Byl	ab	-		Archiv			_	Mont	hs			

N posses TestiAngrico Laboratorias, Inc. Al fabile reserved N fabilihances & Daugh <sup>and</sup> are inclanations of YestiAndrona Lab O N anc

## Client Sample ID: TRIP BLANK\_08

## Date Collected: 11/03/21 00:00

Date Received: 11/06/21 08:00

Method: 8260B - Volatile O	rganic Compo	unds (GC/	MS)						
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.49	ug/L			11/13/21 20:59	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 20:59	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 20:59	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 20:59	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 20:59	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 20:59	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	98		62 - 137					11/13/21 20:59	1

56 - 136

78 - 122

73 - 120

Toluene-d8 (Surr)	109	
Dibromofluoromethane (Surr)	96	
Client Sample ID: MW-184S_	110321	
Date Collected: 11/03/21 10:00		

#### Date Collected: 11/03/21 10:00 Date Received: 11/06/21 08:00

4-Bromofluorobenzene (Surr)

Dibromofluoromethane (Surr)

	•								
Method: 8260B SIM - Volatile	e Organic Co	mpounds (	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			11/12/21 00:38	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	82		66 - 120			-		11/12/21 00:38	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	0.49	ug/L			11/13/21 21:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.46	ug/L			11/13/21 21:22	1
Tetrachloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 21:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.51	ug/L			11/13/21 21:22	1
Trichloroethene	1.0	U	1.0	0.44	ug/L			11/13/21 21:22	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/13/21 21:22	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	103		62 - 137			-		11/13/21 21:22	1
4-Bromofluorobenzene (Surr)	81		56 - 136					11/13/21 21:22	1
Toluene-d8 (Surr)	111		78 - 122					11/13/21 21:22	1

73 - 120

## Client Sample

79

102

Job ID: 240-159510-1

## Lab Sample ID: 240-159510-1 Matrix: Water

11/13/21 20:59

11/13/21 20:59

11/13/21 20:59

Lab Sample ID: 240-159510-2

1

1

1

1

Matrix: Water

11/13/21 21:22