

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

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

TestAmerica Job ID: 240-106461-1

Client Project/Site: Ford LTP Livonia MI - E203631 Revision: 1

For:

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

Attn: Kristoffer Hinskey

Mole Del your

Authorized for release by: 1/18/2019 11:23:21 AM

Michael DelMonico, Project Manager I (330)497-9396 michael.delmonico@testamericainc.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.

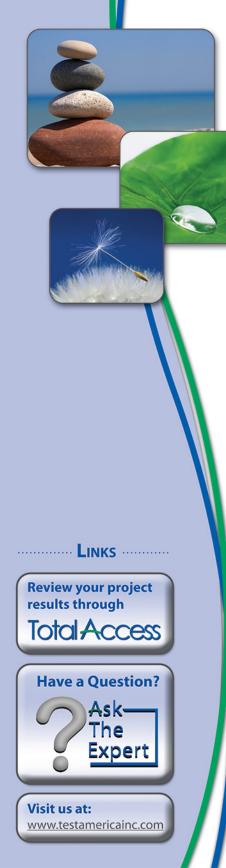


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Client: ARCADIS U.S., Inc. Project/Site: Ford LTP Livonia MI - E203631

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Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.	
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis	
%R	Percent Recovery	8
CFL	Contains Free Liquid	
CNF	Contains No Free Liquid	9
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)	
MDA	Minimum Detectable Activity (Radiochemistry)	
MDC	Minimum Detectable Concentration (Radiochemistry)	
MDL	Method Detection Limit	
ML	Minimum Level (Dioxin)	
NC	Not Calculated	
ND	Not Detected at the reporting limit (or MDL or EDL if shown)	
PQL	Practical Quantitation Limit	
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)	

Job ID: 240-106461-1

Laboratory: TestAmerica Canton

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: Ford LTP Livonia MI - E203631

Report Number: 240-106461-1

Revision

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Revised 1/18/2019 - Report was revised to report samples separately.

TestAmerica Canton attests to the validity of the laboratory data generated by TestAmerica facilities reported herein. All analyses performed by TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of TestAmerica and its client.

RECEIPT

The samples were received on 1/3/2019 8:35 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.4° C.

VOLATILE ORGANIC COMPOUNDS (GCMS)

Sample MW-109S_122818 (240-106461-1) was analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 01/08/2019.

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

VOLATILE ORGANIC COMPOUNDS (GCMS SIM)

Sample MW-109S_122818 (240-106461-1) was analyzed for volatile organic compounds (GCMS SIM) in accordance with EPA SW-846 Method 8260B SIM. The samples were analyzed on 01/08/2019.

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

Client: ARCADIS U.S., Inc. Project/Site: Ford LTP Livonia MI - E203631

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 = 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 Livonia MI - E203631 TestAmerica Job ID: 240-106461-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-106461-1	MW-109S_122818	Water	12/28/18 11:58	01/03/19 08:35

Client Sample ID: MW-109S_122818

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D Method	Prep Type
cis-1,2-Dichloroethene	0.45	J	1.0	0.16	ug/L	1	8260B	Total/NA
trans-1,2-Dichloroethene	0.25	J	1.0	0.19	ug/L	1	8260B	Total/NA
Vinyl chloride	0.28	J	1.0	0.20	ug/L	1	8260B	Total/NA

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Lab Sample ID: 240-106461-1

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

Client Sample ID: MW-109S_122818

Date Collected: 12/28/18 11:58 Date Received: 01/03/19 08:35

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			01/08/19 20:35	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	87		63 - 125			-		01/08/19 20:35	1
Method: 8260B - Volatile O	rganic Compo	unds (GC/	MS)						
Analyte	-	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			01/08/19 16:03	1
cis-1,2-Dichloroethene	0.45	J	1.0	0.16	ug/L			01/08/19 16:03	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			01/08/19 16:03	1
trans-1,2-Dichloroethene	0.25	J	1.0	0.19	ug/L			01/08/19 16:03	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			01/08/19 16:03	1
Vinyl chloride	0.28	J	1.0	0.20	ug/L			01/08/19 16:03	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	99		70 - 121			-		01/08/19 16:03	1
4-Bromofluorobenzene (Surr)	63		59 - 120					01/08/19 16:03	1
Toluene-d8 (Surr)	86		70 - 123					01/08/19 16:03	1
Dibromofluoromethane (Surr)	105		75 - 128					01/08/19 16:03	1

Lab Sample ID: 240-106461-1 Matrix: Water

Prep Type: Total/NA

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

Matrix: Water						Prep Type: Total/NA
-			Pe	ercent Surro	ogate Recovery (Ad	cceptance Limits)
		DCA	BFB	TOL	DBFM	
Lab Sample ID	Client Sample ID	(70-121)	(59-120)	(70-123)	(75-128)	
240-106456-E-1 MS	Matrix Spike	83	85	93	88	
240-106456-H-1 MSD	Matrix Spike Duplicate	79	85	94	88	
240-106461-1	MW-109S_122818	99	63	86	105	
LCS 240-363153/4	Lab Control Sample	73	76	84	81	
MB 240-363153/6	Method Blank	86	59	78	92	
Surrogate Legend						
DCA = 1,2-Dichloroeth	ane-d4 (Surr)					
BFB = 4-Bromofluorob	enzene (Surr)					
TOL = Toluene-d8 (Su	ırr)					
DBFM = Dibromofluor	omethane (Surr)					

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

			Percent Surrogate Recovery (Acceptance Limits)
		DCA	
Lab Sample ID	Client Sample ID	(63-125)	
240-106461-1	MW-109S_122818	87	
500-156985-D-2 MS	Matrix Spike	92	
500-156985-D-2 MSD	Matrix Spike Duplicate	88	
LCS 240-363200/12	Lab Control Sample	85	
MB 240-363200/13	Method Blank	86	
Surrogate Legend			

DCA = 1,2-Dichloroethane-d4 (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	(10-150)	
MRL 240-363200/14	Lab Control Sample	87	
Surrogate Legend			

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

Client Sample ID: Lab Control Sample

Client Sample ID: Matrix Spike

Prep Type: Total/NA

Prep Type: Total/NA

Client Sample ID: Method Blank Prep Type: Total/NA 5

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

Lab Sample ID: MB 240-363153/6 Matrix: Water Analysis Batch: 363153

-	MB	МВ							
Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			01/08/19 10:03	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			01/08/19 10:03	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			01/08/19 10:03	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			01/08/19 10:03	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			01/08/19 10:03	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			01/08/19 10:03	1
	MB	MB							

	IVID	IVID						
Surrogate	%Recovery	Qualifier	Limits	P	repared	Analyzed	Dil Fac	
1,2-Dichloroethane-d4 (Surr)	86		70 - 121			01/08/19 10:03	1	
4-Bromofluorobenzene (Surr)	59		59 - 120			01/08/19 10:03	1	
Toluene-d8 (Surr)	78		70 - 123			01/08/19 10:03	1	
Dibromofluoromethane (Surr)	92		75 - 128			01/08/19 10:03	1	

Lab Sample ID: LCS 240-363153/4 Matrix: Water Analysis Batch: 363153

	Spike	LCS	LCS				%Rec.	
Analyte	Added	Result	Qualifier	Unit	D	%Rec	Limits	
1,1-Dichloroethene	10.0	9.92		ug/L		99	65 - 139	
cis-1,2-Dichloroethene	10.0	9.49		ug/L		95	76 - 128	
Tetrachloroethene	10.0	9.56		ug/L		96	74 - 130	
trans-1,2-Dichloroethene	10.0	10.3		ug/L		103	78 - 133	
Trichloroethene	10.0	8.39		ug/L		84	76 - 125	
Vinyl chloride	10.0	10.0		ug/L		100	58 - 143	

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	73		70 - 121
4-Bromofluorobenzene (Surr)	76		59 - 120
Toluene-d8 (Surr)	84		70 - 123
Dibromofluoromethane (Surr)	81		75 - 128

Lab Sample ID: 240-106456-E-1 MS Matrix: Water Analysis Batch: 363153

Toluene-d8 (Surr)

Analysis Baton. 000100										
	Sample	Sample	Spike	MS	MS				%Rec.	
Analyte	Result	Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	
1,1-Dichloroethene	1.0	U	10.0	8.56		ug/L		86	53 - 140	
cis-1,2-Dichloroethene	1.0	U	10.0	8.72		ug/L		87	64 - 130	
Tetrachloroethene	1.0	U	10.0	9.43		ug/L		94	51 ₋ 136	
trans-1,2-Dichloroethene	1.0	U	10.0	9.48		ug/L		95	68 - 133	
Trichloroethene	0.23	J	10.0	7.83		ug/L		76	55 - 131	
Vinyl chloride	1.0	U	10.0	10.3		ug/L		103	43 ₋ 154	
	MS	MS								
Surrogate	%Recovery	Qualifier	Limits							
1,2-Dichloroethane-d4 (Surr)	83		70 - 121							
4-Bromofluorobenzene (Surr)	85		59 - 120							

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70 - 123

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

Lab Sample ID: 240-106456-E-1 MS **Client Sample ID: Matrix Spike Matrix: Water** Prep Type: Total/NA Analysis Batch: 363153 MS MS %Recovery Qualifier Surrogate Limits Dibromofluoromethane (Surr) 75 - 128 88 Lab Sample ID: 240-106456-H-1 MSD **Client Sample ID: Matrix Spike Duplicate Matrix: Water** Prep Type: Total/NA Analysis Batch: 363153 Sample Sample Spike MSD MSD %Rec. RPD **Result Qualifier** Analyte Added **Result Qualifier** Unit D %Rec Limits RPD Limit 1,1-Dichloroethene 1.0 U 10.0 8.67 ug/L 87 53 - 140 35 1 10.0 8.95 21 cis-1,2-Dichloroethene 1.0 U ug/L 90 64 - 130 3 Tetrachloroethene 1.0 U 10.0 9.43 ug/L 94 51 - 136 0 23 trans-1,2-Dichloroethene 1.0 U 10.0 9.58 96 24 ug/L 68 - 133 1 Trichloroethene 0.23 J 10.0 7.97 ug/L 77 55 - 131 2 23 Vinyl chloride 1.0 U 10.0 10.1 ug/L 101 43 - 154 2 29 MSD MSD Surrogate %Recovery Qualifier Limits 1,2-Dichloroethane-d4 (Surr) 79 70 - 121 4-Bromofluorobenzene (Surr) 85 59 - 120 Toluene-d8 (Surr) 94 70 - 123 Dibromofluoromethane (Surr) 88 75 - 128 Method: 8260B SIM - Volatile Organic Compounds (GC/MS)

Lab Sample ID: MB 240-3 Matrix: Water	63200/13							C	Clie	ent Sam	ple ID: Method Prep Type: To	
Analysis Batch: 363200												
-	MB	MB										
Analyte	Result	Qualifier	RL	I	MDL	Unit		D	Ρ	repared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0		0.86	ug/L					01/08/19 16:23	1
	MB	МВ										
Surrogate	%Recovery	Qualifier	Limits						P	repared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	86		63 - 125					-			01/08/19 16:23	1
Lab Sample ID: LCS 240-3	863200/12						Cli	ont	Sar	nnio ID	: Lab Control S	Sample
Matrix: Water	00200/12							ent	Jai	inple iD	Prep Type: To	
Analysis Batch: 363200			-									
			Spike	-	LCS						%Rec.	
Analyte			Added	Result	Qual	lifier	Unit		D	%Rec	Limits	
1,4-Dioxane			10.0	11.8			ug/L		_	118	59 - 131	
	LCS LC	S										
Surrogate	%Recovery Qu	alifier	Limits									
1,2-Dichloroethane-d4 (Surr)	85		63 - 125									

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

Client: ARCADIS U.S., Inc. Project/Site: Ford LTP Livoni	າia MI - E203€	331					Test/	America	a Job ID: 24	40-1064	461-1	
Method: 8260B SIM - V	Volatile Or	ganic Co	٥mpound	s (GC/M	S) (Con	tinued	l)					
Lab Sample ID: MRL 240-	-363200/14					Clie	ent Sar	mple IC	D: Lab Con			
Matrix: Water								-	Prep Typ	ρ <mark>e: Tot</mark>	al/NA	
Analysis Batch: 363200												5
-			Spike		MRL				%Rec.			
Analyte			Added		Qualifier		D		Limits			
1,4-Dioxane			0.00100	0.00105	J	ng/uL		105	10 - 150			
	MRL	MRL										
Surrogate	%Recovery		Limits									
1,2-Dichloroethane-d4 (Surr)	- <u>////////////////////////////////////</u>		- <u>10 - 150</u>									
-	÷-		10-100									δ
Lab Sample ID: 500-15698	/85-D-2 MS						C'	lient Sa	ample ID: N	Matrix '	Spike	
Matrix: Water									Prep Typ			9
Analysis Batch: 363200											-	
	Sample	Sample	Spike	MS	MS				%Rec.			10
Analyte		Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits			
1,4-Dioxane	2.0	U	10.0	12.5		ug/L		125	52 - 129			
	MS	MS										
Surrogate	%Recovery		Limits									
1.2-Dichloroethane-d4 (Surr)			63 - 125									
			00									
Lab Sample ID: 500-15698	/85-D-2 MSD					Client	Samp	ble ID: M	Matrix Spik	ke Dup	licate	
Matrix: Water									Prep Typ			
Analysis Batch: 363200												
-	Sample	Sample	Spike	MSD	MSD				%Rec.		RPD	
Analyte		Qualifier	Added	Result	Qualifier	Unit	D	%Rec	Limits	RPD	Limit	
1,4-Dioxane	2.0	U	10.0	11.7		ug/L		117	52 - 129	7	13	
	MSD	MSD										
Surrogate	%Recovery		Limits									
1,2-Dichloroethane-d4 (Surr)			63 - 125									
	00		03 - 125									

QC Association Summary

Client: ARCADIS U.S., Inc. Project/Site: Ford LTP Livonia MI - E203631 TestAmerica Job ID: 240-106461-1

GC/MS VOA

Analysis Batch: 363153

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-106461-1	MW-109S_122818	Total/NA	Water	8260B	
MB 240-363153/6	Method Blank	Total/NA	Water	8260B	
_CS 240-363153/4	Lab Control Sample	Total/NA	Water	8260B	
240-106456-E-1 MS	Matrix Spike	Total/NA	Water	8260B	
240-106456-H-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
nalysis Batch: 3632			Metuis	Mathad	Dren Detel
Lab Sample ID	Client Sample ID	Ргер Туре	Matrix	Method	Prep Batch
Lab Sample ID		Prep Type Total/NA	Matrix Water	Method 8260B SIM	Prep Batch
Lab Sample ID 240-106461-1	Client Sample ID	<u>· · · ·</u>			Prep Batch
Lab Sample ID 240-106461-1 MB 240-363200/13	Client Sample ID MW-109S_122818	Total/NA	Water	8260B SIM	Prep Batch
Lab Sample ID 240-106461-1 MB 240-363200/13 _CS 240-363200/12	Client Sample ID MW-109S_122818 Method Blank	Total/NA Total/NA	Water Water	8260B SIM 8260B SIM	Prep Batch
-	Client Sample ID MW-109S_122818 Method Blank Lab Control Sample	Total/NA Total/NA Total/NA	Water Water Water	8260B SIM 8260B SIM 8260B SIM	Prep Batch

Lab Sample ID: 240-106461-1

Matrix: Water

Client Sample ID: MW-109S_122818 Date Collected: 12/28/18 11:58 Date Received: 01/03/19 08:35

	Batch	Batch		Dilution	Batch	Prepared		
Prep Type	Туре	Method	Run	Factor	Number	or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	363153	01/08/19 16:03	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	363200	01/08/19 20:35	SAM	TAL CAN

Laboratory References:

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

Client: ARCADIS U.S., Inc. Project/Site: Ford LTP Livonia MI - E203631 TestAmerica Job ID: 240-106461-1

Laboratory: TestAmerica Canton

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

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-19 *
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-19
Illinois	NELAP	5	200004	07-31-19
Kansas	NELAP	7	E-10336	04-30-19
Kentucky (UST)	State Program	4	58	02-23-19 *
Kentucky (WW)	State Program	4	98016	12-31-19
Minnesota	NELAP	5	039-999-348	12-31-19 *
Minnesota (Petrofund)	State Program	1	3506	07-31-19
Nevada	State Program	9	OH00048	07-31-19
New Jersey	NELAP	2	OH001	06-30-19
New York	NELAP	2	10975	03-31-19 *
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-19 *
Pennsylvania	NELAP	3	68-00340	08-31-19 *
Texas	NELAP	6	T104704517-18-10	08-31-19
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-19
Washington	State Program	10	C971	01-12-20 *
West Virginia DEP	State Program	3	210	12-31-19

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

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IR GUN# IR-8 (CF -0.2 °C) Observed Cooler Temp. °C Corrected Cool IR GUN #36 (CF +0°C) Observed Cooler Temp. °C Corrected Cooler	
	\bigcirc
Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity	Yes No
-Were the seals on the outside of the cooler(s) signed & dated?	Yes No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes No
-Were tamper/custody seals intact and uncompromised?	Yes No NA
Shippers' packing slip attached to the cooler(s)?	Yes No
Did custody papers accompany the sample(s)?	Yes No Tests that are not
Were the custody papers relinquished & signed in the appropriate place?	Yes No checked for pH by
Was/were the person(s) who collected the samples clearly identified on the COC?	Yes No Receiving:
Did all bottles arrive in good condition (Unbroken)?	Yes No VOAs
Could all bottle labels be reconciled with the COC?	Oil and Crosse
Were correct bottle(s) used for the test(s) indicated?	TOC TOC
0. Sufficient quantity received to perform indicated analyses?	Yes No
1. Are these work share samples?	Yes No
If yes, Questions 12-16 have been checked at the originating laboratory.	Yes No (NA) pH Strip Lot# HC854592
2. Were all preserved sample(s) at the correct pH upon receipt?	Yes No (NA) pH Strip Lot# <u>HC854592</u> Yes No
 Were VOAs on the COC? Were air bubbles >6 mm in any VOA vials? 	Yes No NA
	Yes No
N/00 5 WILD from blook procent in the cooler[5]/ Trip Blook I OFF	103(110)
5. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #	
6. Was a LL Hg or Me Hg trip blank present?	Yes No
6. Was a LL Hg or Me Hg trip blank present?	Yes No
	Yes No
6. Was a LL Hg or Me Hg trip blank present?	Yes No
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REVISED REPORT: January 18, 2019 REVISION SUMMARY: Original lab report was separated into site specific submittals.

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: MI001454.0002/3/4.00002/2B/3B Client project scope reference: Sample COC only was used to define project analytical requirements. Laboratory: TestAmerica - North Canton Laboratory submittal: 106461-1 Sample date: 2018-12-28 Report received by CADENA: 2019-01-18 Initial Data Verification completed by CADENA: 2019-01-18

There were no significant QC anomalies or exceptions to report.

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.

1 Water sample(s) was analyzed for GCMS VOC parameter(s).

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.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

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.					
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

CADENA Project ID: E203631 Laboratory: TestAmerica - North Canton Laboratory Submittal: 106461-1

		Sample Name: Lab Sample ID:	MW-109S_122818 2401064611			
		Sample Date:	12/28/2018 Report Valid			
						Valid
	Analyte	Cas No.	Result	Limit	Units	Qualifier
GC/MS VOC						
<u>OSW-8260B</u>						
	1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	
	cis-1,2-Dichloroethene	156-59-2	0.45	1.0	ug/l	J
	Tetrachloroethene	127-18-4	ND	1.0	ug/l	
	trans-1,2-Dichloroethene	156-60-5	0.25	1.0	ug/l	J
	Trichloroethene	79-01-6	ND	1.0	ug/l	
	Vinyl chloride	75-01-4	0.28	1.0	ug/l	J
OSW-8260BBSim						
	1,4-Dioxane	123-91-1	ND	2.0	ug/l	