

ANALYTICAL REPORT

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

Laboratory Job ID: 240-112956-1
Client Project/Site: Ford LTP Livonia MI - E203631

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

Attn: Kristoffer Hinskey



Authorized for release by:
6/5/2019 12:03:24 PM

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

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

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Definitions/Glossary

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

Job ID: 240-112956-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.
F2	MS/MSD RPD exceeds control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.
X	Surrogate is outside control limits

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
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)
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)

Case Narrative

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

Job ID: 240-112956-1

Job ID: 240-112956-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative 240-112956-1

Comments

No additional comments.

Receipt

The samples were received on 5/21/2019 9:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.2° C.

GC/MS VOA

Method(s) 8260B: Surrogate recovery for the following sample was outside the upper control limit: TRIP BLANK (240-112956-6). This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Method(s) 8260B: There was an MS/MSD analyzed in batch 383535 but could not be reported because the associated sample needed reanalyzed in a different batch.

MW-85_051719 (240-112956-1), MW-74_051719 (240-112956-3), DUP-05_051719 (240-112956-5) and TRIP BLANK (240-112956-6)

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

VOA Prep

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

Method Summary

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

Job ID: 240-112956-1

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

Protocol References:

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

Laboratory References:

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



Sample Summary

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

Job ID: 240-112956-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-112956-1	MW-85_051719	Water	05/17/19 09:55	05/21/19 09:00	
240-112956-2	MW-72_051719	Water	05/17/19 12:50	05/21/19 09:00	
240-112956-3	MW-74_051719	Water	05/17/19 14:35	05/21/19 09:00	
240-112956-4	MW-102_051719	Water	05/17/19 11:10	05/21/19 09:00	
240-112956-5	DUP-05_051719	Water	05/17/19 00:00	05/21/19 09:00	
240-112956-6	TRIP BLANK	Water	05/17/19 00:00	05/21/19 09:00	

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

Detection Summary

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

Job ID: 240-112956-1

Client Sample ID: MW-85_051719

Lab Sample ID: 240-112956-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	1.3	J	2.0	0.86	ug/L	1		8260B SIM	Total/NA
Vinyl chloride	5.4		1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: MW-72_051719

Lab Sample ID: 240-112956-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	1.7		1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: MW-74_051719

Lab Sample ID: 240-112956-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	1.3		1.0	0.16	ug/L	1		8260B	Total/NA

Client Sample ID: MW-102_051719

Lab Sample ID: 240-112956-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	1.1	J	2.0	0.86	ug/L	1		8260B SIM	Total/NA
Vinyl chloride	1.8		1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: DUP-05_051719

Lab Sample ID: 240-112956-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	1.9		1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-112956-6

No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Canton

Client Sample Results

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

Job ID: 240-112956-1

Client Sample ID: MW-85_051719

Lab Sample ID: 240-112956-1

Date Collected: 05/17/19 09:55

Matrix: Water

Date Received: 05/21/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	1.3	J	2.0	0.86	ug/L	-		05/28/19 19:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	91		63 - 125		05/28/19 19:42	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L	-		05/29/19 18:51	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L	-		05/29/19 18:51	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L	-		05/29/19 18:51	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L	-		05/29/19 18:51	1
Trichloroethene	1.0	U	1.0	0.10	ug/L	-		05/29/19 18:51	1
Vinyl chloride	5.4		1.0	0.20	ug/L	-		05/29/19 18:51	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	118		70 - 121		05/29/19 18:51	1
4-Bromofluorobenzene (Surr)	66		59 - 120		05/29/19 18:51	1
Toluene-d8 (Surr)	72		70 - 123		05/29/19 18:51	1
Dibromofluoromethane (Surr)	117		75 - 128		05/29/19 18:51	1

Client Sample Results

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

Job ID: 240-112956-1

Client Sample ID: MW-72_051719

Lab Sample ID: 240-112956-2

Date Collected: 05/17/19 12:50

Matrix: Water

Date Received: 05/21/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			05/28/19 20:07	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	88		63 - 125		05/28/19 20:07	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			05/30/19 20:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			05/30/19 20:38	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			05/30/19 20:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			05/30/19 20:38	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			05/30/19 20:38	1
Vinyl chloride	1.7		1.0	0.20	ug/L			05/30/19 20:38	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	106		70 - 121		05/30/19 20:38	1
4-Bromofluorobenzene (Surr)	97		59 - 120		05/30/19 20:38	1
Toluene-d8 (Surr)	93		70 - 123		05/30/19 20:38	1
Dibromofluoromethane (Surr)	111		75 - 128		05/30/19 20:38	1

Client Sample Results

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

Job ID: 240-112956-1

Client Sample ID: MW-74_051719

Lab Sample ID: 240-112956-3

Date Collected: 05/17/19 14:35

Matrix: Water

Date Received: 05/21/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L	-		05/28/19 20:32	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	91		63 - 125		05/28/19 20:32	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L	-		05/29/19 19:39	1
cis-1,2-Dichloroethene	1.3		1.0	0.16	ug/L			05/29/19 19:39	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			05/29/19 19:39	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			05/29/19 19:39	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			05/29/19 19:39	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			05/29/19 19:39	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	121		70 - 121		05/29/19 19:39	1
4-Bromofluorobenzene (Surr)	66		59 - 120		05/29/19 19:39	1
Toluene-d8 (Surr)	74		70 - 123		05/29/19 19:39	1
Dibromofluoromethane (Surr)	115		75 - 128		05/29/19 19:39	1

Client Sample Results

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

Job ID: 240-112956-1

Client Sample ID: MW-102_051719

Lab Sample ID: 240-112956-4

Date Collected: 05/17/19 11:10

Matrix: Water

Date Received: 05/21/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	1.1	J	2.0	0.86	ug/L			05/28/19 20:57	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	86		63 - 125		05/28/19 20:57	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			05/30/19 21:03	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			05/30/19 21:03	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			05/30/19 21:03	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			05/30/19 21:03	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			05/30/19 21:03	1
Vinyl chloride	1.8		1.0	0.20	ug/L			05/30/19 21:03	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	111		70 - 121		05/30/19 21:03	1
4-Bromofluorobenzene (Surr)	100		59 - 120		05/30/19 21:03	1
Toluene-d8 (Surr)	93		70 - 123		05/30/19 21:03	1
Dibromofluoromethane (Surr)	112		75 - 128		05/30/19 21:03	1

Client Sample Results

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

Job ID: 240-112956-1

Client Sample ID: DUP-05_051719

Lab Sample ID: 240-112956-5

Date Collected: 05/17/19 00:00

Matrix: Water

Date Received: 05/21/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			05/28/19 21:23	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	85		63 - 125		05/28/19 21:23	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			05/29/19 20:26	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			05/29/19 20:26	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			05/29/19 20:26	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			05/29/19 20:26	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			05/29/19 20:26	1
Vinyl chloride	1.9		1.0	0.20	ug/L			05/29/19 20:26	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	119		70 - 121		05/29/19 20:26	1
4-Bromofluorobenzene (Surr)	65		59 - 120		05/29/19 20:26	1
Toluene-d8 (Surr)	71		70 - 123		05/29/19 20:26	1
Dibromofluoromethane (Surr)	115		75 - 128		05/29/19 20:26	1

Client Sample Results

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

Job ID: 240-112956-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-112956-6

Date Collected: 05/17/19 00:00

Matrix: Water

Date Received: 05/21/19 09:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			05/29/19 20:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			05/29/19 20:50	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			05/29/19 20:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			05/29/19 20:50	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			05/29/19 20:50	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			05/29/19 20:50	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	130	X	70 - 121		05/29/19 20:50	1
4-Bromofluorobenzene (Surr)	72		59 - 120		05/29/19 20:50	1
Toluene-d8 (Surr)	77		70 - 123		05/29/19 20:50	1
Dibromofluoromethane (Surr)	124		75 - 128		05/29/19 20:50	1

Surrogate Summary

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

Job ID: 240-112956-1

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

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		DCA (70-121)	BFB (59-120)	TOL (70-123)	DBFM (75-128)
240-112956-1	MW-85_051719	118	66	72	117
240-112956-2	MW-72_051719	106	97	93	111
240-112956-3	MW-74_051719	121	66	74	115
240-112956-4	MW-102_051719	111	100	93	112
240-112956-5	DUP-05_051719	119	65	71	115
240-112956-6	TRIP BLANK	130 X	72	77	124
240-112957-B-1 MS	Matrix Spike	103	102	92	100
240-112957-C-1 MSD	Matrix Spike Duplicate	107	105	95	119
LCS 240-383535/4	Lab Control Sample	97	83	76	94
LCS 240-383729/4	Lab Control Sample	106	93	93	113
MB 240-383535/6	Method Blank	113	68	73	109
MB 240-383729/6	Method Blank	107	96	91	110

Surrogate Legend

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

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

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	DCA
		(63-125)
240-112872-C-5 MS	Matrix Spike	92
240-112872-C-5 MSD	Matrix Spike Duplicate	87
240-112956-1	MW-85_051719	91
240-112956-2	MW-72_051719	88
240-112956-3	MW-74_051719	91
240-112956-4	MW-102_051719	86
240-112956-5	DUP-05_051719	85
LCS 240-383278/4	Lab Control Sample	86
MB 240-383278/5	Method Blank	88

Surrogate Legend

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

QC Sample Results

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

Job ID: 240-112956-1

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

Lab Sample ID: MB 240-383535/6
Matrix: Water
Analysis Batch: 383535

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			05/29/19 15:15	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			05/29/19 15:15	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			05/29/19 15:15	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			05/29/19 15:15	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			05/29/19 15:15	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			05/29/19 15:15	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	113		70 - 121		05/29/19 15:15	1
4-Bromofluorobenzene (Surr)	68		59 - 120		05/29/19 15:15	1
Toluene-d8 (Surr)	73		70 - 123		05/29/19 15:15	1
Dibromofluoromethane (Surr)	109		75 - 128		05/29/19 15:15	1

Lab Sample ID: LCS 240-383535/4
Matrix: Water
Analysis Batch: 383535

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.78		ug/L		98	65 - 139
cis-1,2-Dichloroethene	10.0	9.72		ug/L		97	76 - 128
Tetrachloroethene	10.0	12.1		ug/L		121	74 - 130
trans-1,2-Dichloroethene	10.0	10.2		ug/L		102	78 - 133
Trichloroethene	10.0	10.7		ug/L		107	76 - 125
Vinyl chloride	10.0	9.38		ug/L		94	58 - 143

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	97		70 - 121
4-Bromofluorobenzene (Surr)	83		59 - 120
Toluene-d8 (Surr)	76		70 - 123
Dibromofluoromethane (Surr)	94		75 - 128

Lab Sample ID: MB 240-383729/6
Matrix: Water
Analysis Batch: 383729

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			05/30/19 14:26	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			05/30/19 14:26	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			05/30/19 14:26	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			05/30/19 14:26	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			05/30/19 14:26	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			05/30/19 14:26	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	107		70 - 121		05/30/19 14:26	1
4-Bromofluorobenzene (Surr)	96		59 - 120		05/30/19 14:26	1
Toluene-d8 (Surr)	91		70 - 123		05/30/19 14:26	1

Eurofins TestAmerica, Canton

QC Sample Results

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

Job ID: 240-112956-1

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

Lab Sample ID: MB 240-383729/6
Matrix: Water
Analysis Batch: 383729

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

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
Dibromofluoromethane (Surr)	110		75 - 128		05/30/19 14:26	1

Lab Sample ID: LCS 240-383729/4
Matrix: Water
Analysis Batch: 383729

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,2-Dichloroethene	10.0	9.87		ug/L		99	76 - 128
Tetrachloroethene	10.0	10.7		ug/L		107	74 - 130
trans-1,2-Dichloroethene	10.0	10.7		ug/L		107	78 - 133
Trichloroethene	10.0	10.9		ug/L		109	76 - 125
Vinyl chloride	10.0	10.5		ug/L		105	58 - 143

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	106		70 - 121
4-Bromofluorobenzene (Surr)	93		59 - 120
Toluene-d8 (Surr)	93		70 - 123
Dibromofluoromethane (Surr)	113		75 - 128

Lab Sample ID: 240-112957-B-1 MS
Matrix: Water
Analysis Batch: 383729

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
cis-1,2-Dichloroethene	1.0	U F2	10.0	9.09		ug/L		91	64 - 130
Tetrachloroethene	1.0	U F1 F2	10.0	9.89		ug/L		99	51 - 136
trans-1,2-Dichloroethene	1.0	U F2	10.0	9.09		ug/L		91	68 - 133
Trichloroethene	1.0	U F1 F2	10.0	10.2		ug/L		102	55 - 131
Vinyl chloride	2.2	F1 F2	10.0	12.5		ug/L		103	43 - 154

Surrogate	MS MS		Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	103		70 - 121
4-Bromofluorobenzene (Surr)	102		59 - 120
Toluene-d8 (Surr)	92		70 - 123
Dibromofluoromethane (Surr)	100		75 - 128

Lab Sample ID: 240-112957-C-1 MSD
Matrix: Water
Analysis Batch: 383729

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	
										RPD	Limit
1,1-Dichloroethene	1.0	U	10.0	13.1		ug/L		131	53 - 140	34	35
cis-1,2-Dichloroethene	1.0	U F2	10.0	11.9	F2	ug/L		119	64 - 130	27	21
Tetrachloroethene	1.0	U F1 F2	10.0	15.7	F1 F2	ug/L		157	51 - 136	45	23
trans-1,2-Dichloroethene	1.0	U F2	10.0	12.9	F2	ug/L		129	68 - 133	34	24
Trichloroethene	1.0	U F1 F2	10.0	14.3	F1 F2	ug/L		143	55 - 131	34	23

Eurofins TestAmerica, Canton

QC Sample Results

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

Job ID: 240-112956-1

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

Lab Sample ID: 240-112957-C-1 MSD

Client Sample ID: Matrix Spike Duplicate

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 383729

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Vinyl chloride	2.2	F1 F2	10.0	18.6	F1 F2	ug/L		164	43 - 154	39	29
Surrogate	MSD %Recovery	MSD Qualifier	Limits								
1,2-Dichloroethane-d4 (Surr)	107		70 - 121								
4-Bromofluorobenzene (Surr)	105		59 - 120								
Toluene-d8 (Surr)	95		70 - 123								
Dibromofluoromethane (Surr)	119		75 - 128								

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

Lab Sample ID: MB 240-383278/5

Client Sample ID: Method Blank

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 383278

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			05/28/19 12:34	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	88		63 - 125					05/28/19 12:34	1

Lab Sample ID: LCS 240-383278/4

Client Sample ID: Lab Control Sample

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 383278

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	12.3		ug/L		123	59 - 131
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
1,2-Dichloroethane-d4 (Surr)	86		63 - 125				

Lab Sample ID: 240-112872-C-5 MS

Client Sample ID: Matrix Spike

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 383278

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	11.7		ug/L		117	52 - 129
Surrogate	MS %Recovery	MS Qualifier	Limits						
1,2-Dichloroethane-d4 (Surr)	92		63 - 125						

Lab Sample ID: 240-112872-C-5 MSD

Client Sample ID: Matrix Spike Duplicate

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 383278

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	2.0	U	10.0	12.0		ug/L		120	52 - 129	3	13

Eurofins TestAmerica, Canton

QC Sample Results

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

Job ID: 240-112956-1

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

Lab Sample ID: 240-112872-C-5 MSD
Matrix: Water
Analysis Batch: 383278

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

<i>Surrogate</i>	<i>MSD</i> <i>%Recovery</i>	<i>MSD</i> <i>Qualifier</i>	<i>Limits</i>
1,2-Dichloroethane-d4 (Surr)	87		63 - 125

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

QC Association Summary

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

Job ID: 240-112956-1

GC/MS VOA

Analysis Batch: 383278

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-112956-1	MW-85_051719	Total/NA	Water	8260B SIM	
240-112956-2	MW-72_051719	Total/NA	Water	8260B SIM	
240-112956-3	MW-74_051719	Total/NA	Water	8260B SIM	
240-112956-4	MW-102_051719	Total/NA	Water	8260B SIM	
240-112956-5	DUP-05_051719	Total/NA	Water	8260B SIM	
MB 240-383278/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-383278/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-112872-C-5 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-112872-C-5 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 383535

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-112956-1	MW-85_051719	Total/NA	Water	8260B	
240-112956-3	MW-74_051719	Total/NA	Water	8260B	
240-112956-5	DUP-05_051719	Total/NA	Water	8260B	
240-112956-6	TRIP BLANK	Total/NA	Water	8260B	
MB 240-383535/6	Method Blank	Total/NA	Water	8260B	
LCS 240-383535/4	Lab Control Sample	Total/NA	Water	8260B	

Analysis Batch: 383729

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-112956-2	MW-72_051719	Total/NA	Water	8260B	
240-112956-4	MW-102_051719	Total/NA	Water	8260B	
MB 240-383729/6	Method Blank	Total/NA	Water	8260B	
LCS 240-383729/4	Lab Control Sample	Total/NA	Water	8260B	
240-112957-B-1 MS	Matrix Spike	Total/NA	Water	8260B	
240-112957-C-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

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

Job ID: 240-112956-1

Client Sample ID: MW-85_051719

Lab Sample ID: 240-112956-1

Date Collected: 05/17/19 09:55

Matrix: Water

Date Received: 05/21/19 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	383535	05/29/19 18:51	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	383278	05/28/19 19:42	SAM	TAL CAN

Client Sample ID: MW-72_051719

Lab Sample ID: 240-112956-2

Date Collected: 05/17/19 12:50

Matrix: Water

Date Received: 05/21/19 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	383729	05/30/19 20:38	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	383278	05/28/19 20:07	SAM	TAL CAN

Client Sample ID: MW-74_051719

Lab Sample ID: 240-112956-3

Date Collected: 05/17/19 14:35

Matrix: Water

Date Received: 05/21/19 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	383535	05/29/19 19:39	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	383278	05/28/19 20:32	SAM	TAL CAN

Client Sample ID: MW-102_051719

Lab Sample ID: 240-112956-4

Date Collected: 05/17/19 11:10

Matrix: Water

Date Received: 05/21/19 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	383729	05/30/19 21:03	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	383278	05/28/19 20:57	SAM	TAL CAN

Client Sample ID: DUP-05_051719

Lab Sample ID: 240-112956-5

Date Collected: 05/17/19 00:00

Matrix: Water

Date Received: 05/21/19 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	383535	05/29/19 20:26	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	383278	05/28/19 21:23	SAM	TAL CAN

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-112956-6

Date Collected: 05/17/19 00:00

Matrix: Water

Date Received: 05/21/19 09:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	383535	05/29/19 20:50	LRW	TAL CAN

Laboratory References:

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

Eurofins TestAmerica, Canton

Accreditation/Certification Summary

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

Job ID: 240-112956-1

Laboratory: Eurofins TestAmerica, Canton

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

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-20
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-19 *
Illinois	NELAP	5	200004	07-31-19 *
Iowa	State Program	7	421	06-01-21
Kansas	NELAP	7	E-10336	04-30-20
Kentucky (UST)	State Program	4	58	02-23-20
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	03-31-20
Ohio VAP	State Program	5	CL0024	09-06-19 *
Oregon	NELAP	10	4062	02-23-20
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.

eurolins TestAmerica, Canton
 4101 Shuffel Street NW
 North Canton, OH 44720
 Phone (330) 497-9396 Fax (330) 497-0772

MICHIGAN Chain of Custody Record 190

2/14/20

eurolins

Client Information		Lab PM: DelMonico, Michael		Carrier Tracking No(s): 240-60548-25803.8	
Client Contact: Caitlin O'Neill		E-Mail: michael.delmonico@testamericainc.com		Page: 1 of 1	
Company: ARCADIS U.S. Inc		Address: 28550 Cabot Drive Suite 500		Job #:	
City: Novi		State, Zip: MI, 48377		Preservation Codes: M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecylhydrate U - Acetone V - MCAA W - pH 4-5 Z - other (specify)	
Phone: 248-722-2411		Due Date Requested: 10		A - HCL B - H2O2	
Email: Caitlin.O'Neill@arcadis.com		TAT Requested (days): 10		Other:	
Project Name: Ford LTP Livonia MI - E203631		WO #: CADENA # E203631		Barcode: 240-112956 Chain of Custody	
Site: ROW		Project #: 24015353		Total Number of containers: 6	
Site: ROW		SSOW#: 24015353		Special Instructions/Note: 6 DUP-05-051719 1 Trip Blanks	

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Preservation Code	Matrix (W=water, S=solid, O=organic, B=biological, T=tissue, A=air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	R260B, R260B SIM	R260B - VOCs (Short List)
MW-85-051719	5/17/19	0955	6		Water	X	X	U33	
MW-72-051719	5/17/19	1250	6		Water	X	X	U33	
MW-74-051719	5/17/19	1435	6		Water	X	X	U33	
MW-102-051719	5/17/19	1110	6		Water	X	X	U33	
DUP-05-051719	5/17/19	-	6		Water	X	X	U33	
Trip Blanks	5/17/19	-	-		Water	X	X	-	

Possible Hazard Identification
 Non-Hazard Flammable Skin Irritant Radiological
 Deliverable Requested: I, II, III, Other (specify)

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return To Client Disposal By Lab Archive For _____ Months

Special Instructions/OC Requirements: Submit all results through Cadena at jim.tormaling@arcadis.com

Relinquished by: <i>Christin the</i>	Date: 5/17/19	Time: 1600	Company: Arcadis
Relinquished by: <i>Caitlin O'Neill</i>	Date: 5/20/19	Time: 1445	Company: Arcadis
Relinquished by: <i>Jim</i>	Date: 5-20-19	Time: 1137	Company: ETA

Custody Seal Impact: Yes No
 Custody Seal No.:



TestAmerica Canton Sample Receipt Form/Narrative

Login # : 112950

Canton Facility

Client Arcadis Site Name Cooler unpacked by: Cooler Received on 5/20/19 Opened on 5/20/19 FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

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-8 (CF -0.2 °C) Observed Cooler Temp. 2.4 °C Corrected Cooler Temp. 2.2 °C IR GUN #36 (CF +0.7°C) Observed Cooler Temp. °C Corrected Cooler Temp. °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
-Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
-Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels be reconciled with the COC? Yes No
9. Were correct bottle(s) used for the test(s) indicated? Yes No
10. Sufficient quantity received to perform indicated analyses? Yes No
11. Are these work share samples? Yes No
If yes, Questions 12-16 have been checked at the originating laboratory.
12. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC984738
13. Were VOAs on the COC? Yes No
14. Were air bubbles >6 mm in any VOA vials? Larger than this. Yes No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 804407 Yes No
16. Was a LL Hg or Me Hg trip blank present? Yes No

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

Contacted PM Date by via Verbal Voice Mail Other Concerning

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES Samples processed by: JR

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

19. SAMPLE PRESERVATION Sample(s) were further preserved in the laboratory. Time preserved: Preservative(s) added/Lot number(s): VOA Sample Preservation - Date/Time VOAs Frozen: