

ANALYTICAL REPORT

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Laboratory Job ID: 240-119198-1

Client Project/Site: Ford LTP Livonia MI - E203631

For:

ARCADIS U.S., Inc.
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Attn: Kristoffer Hinskey



Authorized for release by:
10/4/2019 11:56:42 AM

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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: 240-119198-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
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.
□	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: 240-119198-1

Job ID: 240-119198-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: Ford LTP Livonia MI - E203631

Report Number: 240-119198-1

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.

Eurofins TestAmerica, Canton attests to the validity of the laboratory data generated by Eurofins TestAmerica facilities reported herein. All analyses performed by Eurofins TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins 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 Eurofins TestAmerica and its client.

RECEIPT

The samples were received on 9/20/2019 8:25 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.9° C.

VOLATILE ORGANIC COMPOUNDS (GCMS)

Samples MW-102_091819 (240-119198-1), MW-102S_091819 (240-119198-2), DUP-05 (240-119198-3) and TRIP BLANK (240-119198-4) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 09/30/2019.

1,2-Dichloroethane-d4 (Surr) failed the surrogate recovery criteria high for MW-102S_091819 (240-119198-2). Refer to the QC report for details. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

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

VOLATILE ORGANIC COMPOUNDS (GCMS SIM)

Samples MW-102_091819 (240-119198-1), MW-102S_091819 (240-119198-2) and DUP-05 (240-119198-3) were analyzed for volatile organic compounds (GCMS SIM) in accordance with EPA SW-846 Method 8260B SIM. The samples were analyzed on 09/25/2019 and 09/26/2019.

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

Method Summary

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

Job ID: 240-119198-1

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: 240-119198-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-119198-1	MW-102_091819	Water	09/18/19 11:23	09/20/19 08:25	
240-119198-2	MW-102S_091819	Water	09/18/19 13:45	09/20/19 08:25	
240-119198-3	DUP-05	Water	09/18/19 00:00	09/20/19 08:25	
240-119198-4	TRIP BLANK	Water	09/18/19 00:00	09/20/19 08:25	

- 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: 240-119198-1

Client Sample ID: MW-102_091819

Lab Sample ID: 240-119198-1

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

Client Sample ID: MW-102S_091819

Lab Sample ID: 240-119198-2

No Detections.

Client Sample ID: DUP-05

Lab Sample ID: 240-119198-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	1.2	J	2.0	0.86	ug/L	1		8260B SIM	Total/NA
Vinyl chloride	1.0		1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-119198-4

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: 240-119198-1

Client Sample ID: MW-102_091819

Lab Sample ID: 240-119198-1

Date Collected: 09/18/19 11:23

Matrix: Water

Date Received: 09/20/19 08:25

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	1.0	J	2.0	0.86	ug/L			09/26/19 13:39	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	70		63 - 125		09/26/19 13:39	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			09/30/19 00:00	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			09/30/19 00:00	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			09/30/19 00:00	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			09/30/19 00:00	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			09/30/19 00:00	1
Vinyl chloride	1.0		1.0	0.20	ug/L			09/30/19 00:00	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	110		70 - 121		09/30/19 00:00	1
4-Bromofluorobenzene (Surr)	100		59 - 120		09/30/19 00:00	1
Toluene-d8 (Surr)	102		70 - 123		09/30/19 00:00	1
Dibromofluoromethane (Surr)	86		75 - 128		09/30/19 00:00	1

Client Sample Results

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

Job ID: 240-119198-1

Client Sample ID: MW-102S_091819

Lab Sample ID: 240-119198-2

Date Collected: 09/18/19 13:45

Matrix: Water

Date Received: 09/20/19 08:25

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	-		09/25/19 21:49	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	116		63 - 125		09/25/19 21:49	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	-		09/30/19 00:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L	-		09/30/19 00:22	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L	-		09/30/19 00:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L	-		09/30/19 00:22	1
Trichloroethene	1.0	U	1.0	0.10	ug/L	-		09/30/19 00:22	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L	-		09/30/19 00:22	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	125	X	70 - 121		09/30/19 00:22	1
4-Bromofluorobenzene (Surr)	100		59 - 120		09/30/19 00:22	1
Toluene-d8 (Surr)	102		70 - 123		09/30/19 00:22	1
Dibromofluoromethane (Surr)	95		75 - 128		09/30/19 00:22	1

Client Sample Results

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

Job ID: 240-119198-1

Client Sample ID: DUP-05

Lab Sample ID: 240-119198-3

Date Collected: 09/18/19 00:00

Matrix: Water

Date Received: 09/20/19 08:25

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	1.2	J	2.0	0.86	ug/L	-		09/25/19 22:13	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	116		63 - 125		09/25/19 22:13	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	-		09/30/19 00:45	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L	-		09/30/19 00:45	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L	-		09/30/19 00:45	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L	-		09/30/19 00:45	1
Trichloroethene	1.0	U	1.0	0.10	ug/L	-		09/30/19 00:45	1
Vinyl chloride	1.0		1.0	0.20	ug/L	-		09/30/19 00:45	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	111		70 - 121		09/30/19 00:45	1
4-Bromofluorobenzene (Surr)	99		59 - 120		09/30/19 00:45	1
Toluene-d8 (Surr)	99		70 - 123		09/30/19 00:45	1
Dibromofluoromethane (Surr)	84		75 - 128		09/30/19 00:45	1

Client Sample Results

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

Job ID: 240-119198-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-119198-4

Date Collected: 09/18/19 00:00

Matrix: Water

Date Received: 09/20/19 08:25

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			09/30/19 01:07	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			09/30/19 01:07	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			09/30/19 01:07	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			09/30/19 01:07	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			09/30/19 01:07	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			09/30/19 01:07	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	117		70 - 121		09/30/19 01:07	1
4-Bromofluorobenzene (Surr)	99		59 - 120		09/30/19 01:07	1
Toluene-d8 (Surr)	97		70 - 123		09/30/19 01:07	1
Dibromofluoromethane (Surr)	90		75 - 128		09/30/19 01:07	1

Surrogate Summary

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

Job ID: 240-119198-1

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

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	DCA	BFB	TOL	DBFM
		(70-121)	(59-120)	(70-123)	(75-128)
240-119198-1	MW-102_091819	110	100	102	86
240-119198-2	MW-102S_091819	125 X	100	102	95
240-119198-3	DUP-05	111	99	99	84
240-119198-4	TRIP BLANK	117	99	97	90
240-119199-K-1 MS	Matrix Spike	118	96	98	86
240-119199-N-1 MSD	Matrix Spike Duplicate	117	98	102	96
LCS 240-403086/4	Lab Control Sample	113	96	95	92
MB 240-403086/6	Method Blank	116	98	97	87

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)
240-119198-1	MW-102_091819	70
240-119198-2	MW-102S_091819	116
240-119198-3	DUP-05	116
240-119199-A-1 MS	Matrix Spike	120
240-119199-A-1 MSD	Matrix Spike Duplicate	122
240-119202-D-1 MS	Matrix Spike	73
240-119202-D-1 MSD	Matrix Spike Duplicate	72
LCS 240-402430/4	Lab Control Sample	113
LCS 240-402640/4	Lab Control Sample	72
MB 240-402430/5	Method Blank	115
MB 240-402640/5	Method Blank	72

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: 240-119198-1

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

Lab Sample ID: MB 240-403086/6
Matrix: Water
Analysis Batch: 403086

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			09/29/19 23:16	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			09/29/19 23:16	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			09/29/19 23:16	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			09/29/19 23:16	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			09/29/19 23:16	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			09/29/19 23:16	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	116		70 - 121		09/29/19 23:16	1
4-Bromofluorobenzene (Surr)	98		59 - 120		09/29/19 23:16	1
Toluene-d8 (Surr)	97		70 - 123		09/29/19 23:16	1
Dibromofluoromethane (Surr)	87		75 - 128		09/29/19 23:16	1

Lab Sample ID: LCS 240-403086/4
Matrix: Water
Analysis Batch: 403086

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	9.09		ug/L		91	65 - 139
cis-1,2-Dichloroethene	10.0	10.3		ug/L		103	76 - 128
Tetrachloroethene	10.0	8.56		ug/L		86	74 - 130
trans-1,2-Dichloroethene	10.0	10.0		ug/L		100	78 - 133
Trichloroethene	10.0	8.99		ug/L		90	76 - 125
Vinyl chloride	10.0	8.56		ug/L		86	58 - 143

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	113		70 - 121
4-Bromofluorobenzene (Surr)	96		59 - 120
Toluene-d8 (Surr)	95		70 - 123
Dibromofluoromethane (Surr)	92		75 - 128

Lab Sample ID: 240-119199-K-1 MS
Matrix: Water
Analysis Batch: 403086

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	7.38		ug/L		74	53 - 140
cis-1,2-Dichloroethene	1.0	U	10.0	8.66		ug/L		87	64 - 130
Tetrachloroethene	1.0	U	10.0	7.78		ug/L		78	51 - 136
trans-1,2-Dichloroethene	1.0	U	10.0	8.24		ug/L		82	68 - 133
Trichloroethene	1.0	U	10.0	7.21		ug/L		72	55 - 131
Vinyl chloride	1.0	U	10.0	6.41		ug/L		64	43 - 154

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	118		70 - 121
4-Bromofluorobenzene (Surr)	96		59 - 120
Toluene-d8 (Surr)	98		70 - 123

QC Sample Results

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

Job ID: 240-119198-1

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

Lab Sample ID: 240-119199-K-1 MS
Matrix: Water
Analysis Batch: 403086

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

Surrogate	MS %Recovery	MS Qualifier	Limits
Dibromofluoromethane (Surr)	86		75 - 128

Lab Sample ID: 240-119199-N-1 MSD
Matrix: Water
Analysis Batch: 403086

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	8.57		ug/L		86	53 - 140	15	35
cis-1,2-Dichloroethene	1.0	U	10.0	9.27		ug/L		93	64 - 130	7	21
Tetrachloroethene	1.0	U	10.0	7.60		ug/L		76	51 - 136	2	23
trans-1,2-Dichloroethene	1.0	U	10.0	8.84		ug/L		88	68 - 133	7	24
Trichloroethene	1.0	U	10.0	7.81		ug/L		78	55 - 131	8	23
Vinyl chloride	1.0	U	10.0	7.73		ug/L		77	43 - 154	19	29

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	117		70 - 121
4-Bromofluorobenzene (Surr)	98		59 - 120
Toluene-d8 (Surr)	102		70 - 123
Dibromofluoromethane (Surr)	96		75 - 128

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

Lab Sample ID: MB 240-402430/5
Matrix: Water
Analysis Batch: 402430

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

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			09/25/19 13:06	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	115		63 - 125		09/25/19 13:06	1

Lab Sample ID: LCS 240-402430/4
Matrix: Water
Analysis Batch: 402430

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	11.9		ug/L		119	59 - 131

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	113		63 - 125

Lab Sample ID: 240-119199-A-1 MS
Matrix: Water
Analysis Batch: 402430

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	11.5		ug/L		115	52 - 129

Eurofins TestAmerica, Canton

QC Sample Results

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

Job ID: 240-119198-1

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

<i>Surrogate</i>	<i>MS</i> <i>%Recovery</i>	<i>MS</i> <i>Qualifier</i>	<i>Limits</i>
1,2-Dichloroethane-d4 (Surr)	120		63 - 125

Lab Sample ID: 240-119199-A-1 MSD
Matrix: Water
Analysis Batch: 402430

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

<i>Analyte</i>	<i>Sample</i> <i>Result</i>	<i>Sample</i> <i>Qualifier</i>	<i>Spike</i> <i>Added</i>	<i>MSD</i> <i>Result</i>	<i>MSD</i> <i>Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>%Rec.</i> <i>Limits</i>	<i>RPD</i>	<i>RPD</i> <i>Limit</i>
1,4-Dioxane	2.0	U	10.0	11.0		ug/L		110	52 - 129	4	13

<i>Surrogate</i>	<i>MSD</i> <i>%Recovery</i>	<i>MSD</i> <i>Qualifier</i>	<i>Limits</i>
1,2-Dichloroethane-d4 (Surr)	122		63 - 125

Lab Sample ID: MB 240-402640/5
Matrix: Water
Analysis Batch: 402640

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

<i>Analyte</i>	<i>MB</i> <i>Result</i>	<i>MB</i> <i>Qualifier</i>	<i>RL</i>	<i>MDL</i>	<i>Unit</i>	<i>D</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			09/26/19 12:48	1

<i>Surrogate</i>	<i>MB</i> <i>%Recovery</i>	<i>MB</i> <i>Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
1,2-Dichloroethane-d4 (Surr)	72		63 - 125		09/26/19 12:48	1

Lab Sample ID: LCS 240-402640/4
Matrix: Water
Analysis Batch: 402640

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

<i>Analyte</i>	<i>Spike</i> <i>Added</i>	<i>LCS</i> <i>Result</i>	<i>LCS</i> <i>Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>%Rec.</i> <i>Limits</i>
1,4-Dioxane	10.0	11.5		ug/L		115	59 - 131

<i>Surrogate</i>	<i>LCS</i> <i>%Recovery</i>	<i>LCS</i> <i>Qualifier</i>	<i>Limits</i>
1,2-Dichloroethane-d4 (Surr)	72		63 - 125

Lab Sample ID: 240-119202-D-1 MS
Matrix: Water
Analysis Batch: 402640

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

<i>Analyte</i>	<i>Sample</i> <i>Result</i>	<i>Sample</i> <i>Qualifier</i>	<i>Spike</i> <i>Added</i>	<i>MS</i> <i>Result</i>	<i>MS</i> <i>Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>%Rec.</i> <i>Limits</i>
1,4-Dioxane	2.0	U	10.0	12.3		ug/L		123	52 - 129

<i>Surrogate</i>	<i>MS</i> <i>%Recovery</i>	<i>MS</i> <i>Qualifier</i>	<i>Limits</i>
1,2-Dichloroethane-d4 (Surr)	73		63 - 125

Lab Sample ID: 240-119202-D-1 MSD
Matrix: Water
Analysis Batch: 402640

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

<i>Analyte</i>	<i>Sample</i> <i>Result</i>	<i>Sample</i> <i>Qualifier</i>	<i>Spike</i> <i>Added</i>	<i>MSD</i> <i>Result</i>	<i>MSD</i> <i>Qualifier</i>	<i>Unit</i>	<i>D</i>	<i>%Rec</i>	<i>%Rec.</i> <i>Limits</i>	<i>RPD</i>	<i>RPD</i> <i>Limit</i>
1,4-Dioxane	2.0	U	10.0	12.7		ug/L		127	52 - 129	3	13

QC Sample Results

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

Job ID: 240-119198-1

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

Lab Sample ID: 240-119202-D-1 MSD
Matrix: Water
Analysis Batch: 402640

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

<i>Surrogate</i>	<i>MSD</i>	<i>MSD</i>	<i>Limits</i>
	<i>%Recovery</i>	<i>Qualifier</i>	
1,2-Dichloroethane-d4 (Surr)	72		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: 240-119198-1

GC/MS VOA

Analysis Batch: 402430

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-119198-2	MW-102S_091819	Total/NA	Water	8260B SIM	
240-119198-3	DUP-05	Total/NA	Water	8260B SIM	
MB 240-402430/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-402430/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-119199-A-1 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-119199-A-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 402640

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-119198-1	MW-102_091819	Total/NA	Water	8260B SIM	
MB 240-402640/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-402640/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-119202-D-1 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-119202-D-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 403086

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-119198-1	MW-102_091819	Total/NA	Water	8260B	
240-119198-2	MW-102S_091819	Total/NA	Water	8260B	
240-119198-3	DUP-05	Total/NA	Water	8260B	
240-119198-4	TRIP BLANK	Total/NA	Water	8260B	
MB 240-403086/6	Method Blank	Total/NA	Water	8260B	
LCS 240-403086/4	Lab Control Sample	Total/NA	Water	8260B	
240-119199-K-1 MS	Matrix Spike	Total/NA	Water	8260B	
240-119199-N-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: 240-119198-1

Client Sample ID: MW-102_091819

Lab Sample ID: 240-119198-1

Date Collected: 09/18/19 11:23

Matrix: Water

Date Received: 09/20/19 08:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	403086	09/30/19 00:00	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	402640	09/26/19 13:39	SAM	TAL CAN

Client Sample ID: MW-102S_091819

Lab Sample ID: 240-119198-2

Date Collected: 09/18/19 13:45

Matrix: Water

Date Received: 09/20/19 08:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	403086	09/30/19 00:22	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	402430	09/25/19 21:49	SAM	TAL CAN

Client Sample ID: DUP-05

Lab Sample ID: 240-119198-3

Date Collected: 09/18/19 00:00

Matrix: Water

Date Received: 09/20/19 08:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	403086	09/30/19 00:45	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	402430	09/25/19 22:13	SAM	TAL CAN

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-119198-4

Date Collected: 09/18/19 00:00

Matrix: Water

Date Received: 09/20/19 08:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	403086	09/30/19 01:07	LEE	TAL CAN

Laboratory References:

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

Accreditation/Certification Summary

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

Job ID: 240-119198-1

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	02-23-20
California	State Program	2927	02-23-20
Connecticut	State	PH-0590	12-31-19
Connecticut	State Program	PH-0590	12-31-19
Florida	NELAP	E87225	06-30-20
Florida	NELAP	E87225	06-30-20
Georgia	State	4062	02-23-20
Georgia	State Program	N/A	02-23-20
Illinois	NELAP	200004	07-31-20
Illinois	NELAP	004498	07-31-20
Iowa	State	421	06-01-20
Iowa	State Program	421	06-01-21
Kansas	NELAP	E-10336	04-30-20
Kansas	NELAP	E-10336	04-30-20
Kentucky (UST)	State	112225	02-23-20
Kentucky (UST)	State Program	58	02-23-20
Kentucky (WW)	State	KY98016	12-31-19
Kentucky (WW)	State Program	98016	12-31-19
Minnesota	NELAP	039-999-348	12-31-19 *
Minnesota	NELAP	OH00048	12-31-19
Minnesota (Petrofund)	State Program	3506	07-31-21
New Jersey	NELAP	OH001	06-30-20
New Jersey	NELAP	OH001	06-30-20
New York	NELAP	10975	03-31-20
New York	NELAP	10975	03-31-20
Ohio VAP	State	CL0024	06-05-21
Ohio VAP	State Program	CL0024	06-05-21
Oregon	NELAP	4062	02-23-20
Oregon	NELAP	4062	02-23-20
Pennsylvania	NELAP	68-00340	08-31-20
Pennsylvania	NELAP	68-00340	08-31-20
Texas	NELAP	T104704517-19-11	08-31-20
Texas	NELAP	T104704517-18-10	08-31-20
USDA	Federal	P330-16-00404	12-28-19
USDA	US Federal Programs	P330-16-00404	12-28-19
Virginia	NELAP	460175	09-14-20
Virginia	NELAP	010101	09-14-20
Washington	State	C971	01-12-20
Washington	State Program	C971	01-12-20 *
West Virginia DEP	State	210	12-31-19
West Virginia DEP	State Program	210	12-31-19

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

Chain of Custody Record

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

Client Contact Company Name: Arcadis Address: 26550 Cabot Drive, Suite 500 City/State/Zip: Novi, MI, 48377 Phone: 248-994-2240 Project Name: Ford LTP Project Number: M1001454.0004.0002B PO # M1001454.0004.0002B		Regulatory program: <input type="checkbox"/> DW <input type="checkbox"/> NPDES <input type="checkbox"/> RCRA <input type="checkbox"/> Other	
Client Project Manager: Kris Hinskey Telephone: 248-994-2240 Email: kris@hinskey.com		Lab Contact: Mike DelMontico Telephone: 330-497-9396	
Method of Shipment/Carrier: Shipping/Tracking No:		Analyses 1,1-DCE 8260B Cis-1,2-DCE 8260B Trans-1,2-DCE 8260B PCE 8260B TCE 8260B Vinyl Chloride 8260B 1,4-Dioxane 8260B SIM	
Sample Identification Sample Date Sample Time mw-102-091819 9/18/19 11:23 mw-102S-091819 9/18/19 13:45 DUP-05 9/18/19 --- Trip Blank ---		Containers & Preservatives H2SO4 HNO3 HCl NaOH ZnAc Lupres Other:	
Matrix Air Aqueous Sediment Solid Other:		Filtered Sample (Y/N) Composite C/Grab-C 1,1-DCE 8260B Cis-1,2-DCE 8260B Trans-1,2-DCE 8260B PCE 8260B TCE 8260B Vinyl Chloride 8260B 1,4-Dioxane 8260B SIM	
Sample Specific Notes / Special Instructions: 6 containers 6 containers 6 containers 1 container		Date/Time: 9/18/19 19:00 Date/Time: 9-19-19 10:15 Date/Time: 9/20/19 8:25	



Possible Hazard Identification
 Non-Hazard Irritant Poison B Unknown

Special Instructions/QC Requirements & Comments:
 Submit all results through Cadena at jim.tomalia@cadena.com. Cadena #E203631
 Level IV Reporting requested.

Relinquished by: <i>Melissa Weaver</i>	Date/Time: 9/18/19 19:00	Company: Arcadis
Relinquished by: <i>RACHEL BIELAK</i>	Date/Time: 9/19/19 10:15	Company: ARCADIS
Relinquished by: <i>[Signature]</i>	Date/Time: 9-19-19 14:05	Company: ETA

Received by: *[Signature]* Date/Time: 9/18/19 19:00 Company: Arcadis
Received by: *[Signature]* Date/Time: 9-19-19 10:15 Company: ETA
Received in Laboratory by: *[Signature]* Date/Time: 9-20-19 8:25 Company: TAC

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Eurofins TestAmerica Canton Sample Receipt Form/Narrative		Login # : <u>119198</u>
Canton Facility		
Client <u>Accu-^{dis}</u>	Site Name _____	Cooler unpacked by: <u>DcD</u>
Cooler Received on <u>9/20/19</u>	Opened on <u>9/20/19</u>	
FedEx: 1 st <input checked="" type="radio"/> <u>Grd</u> Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other		
Receipt After-hours: Drop-off Date/Time		Storage Location
TestAmerica Cooler # <u>TAC</u>	Foam Box _____	Client Cooler _____
Packing material used: <u>Bubble Wrap</u>	Foam _____	Plastic Bag _____
COOLANT: <u>Wet Ice</u>	Blue Ice _____	Dry Ice _____
	Water _____	None _____
1. Cooler temperature upon receipt <input checked="" type="checkbox"/> See Multiple Cooler Form		
IR GUN# IR-10 (CF +0.7 °C)	Observed Cooler Temp. <u>1.2</u> °C	Corrected Cooler Temp. <u>1.9</u> °C
IR GUN #IR-11 (CF +0.9°C)	Observed Cooler Temp. _____ °C	Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity <u>1 each</u> 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 <u>No</u>		
-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 <u>No</u>		
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 <u>No</u>		
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 <u>NA</u> pH Strip Lot# <u>HC991818</u>		
13. Were VOAs on the COC? Yes <u>No</u>		
14. Were air bubbles >6 mm in any VOA vials? <input checked="" type="radio"/> Larger than this. Yes <u>No</u> NA		
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # <u>N/A</u> Yes No		
16. Was a LL Hg or Me Hg trip blank present? Yes <u>No</u>		
Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other		
Concerning _____		

Tests that are not checked for pH by Receiving:

 VOAs
 Oil and Grease
 TOC

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES	Samples processed by: <u>MS</u>
<hr/> <hr/> <hr/> <hr/>	

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: _____