

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Canton

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North Canton, OH 44720

Tel: (330)497-9396

TestAmerica Job ID: 240-104655-1

Client Project/Site: Ford LTP Livonia MI - E203631

Revision: 1

For:

ARCADIS U.S., Inc.

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Novi, Michigan 48377

Attn: Kristoffer Hinskey



Authorized for release by:

1/16/2019 4:28:27 PM

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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

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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.
X	Surrogate is outside control limits
H	Sample was prepped or analyzed beyond the specified holding time
F2	MS/MSD RPD exceeds control limits
F4	MS/MSD RPD exceeds control limits due to sample size difference.

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

TestAmerica Job ID: 240-104655-1

Job ID: 240-104655-1

Laboratory: TestAmerica Canton

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: Ford LTP Livonia MI - E203631

Report Number: 240-104655-1

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 1/16/2019 - 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 11/20/2018 9:50 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 2.7° C, 3.3° C and 3.5° C.

VOLATILE ORGANIC COMPOUNDS (GCMS)

Samples HPT-202_19-23_111518 (240-104655-1), HPT-202_14-18_111518 (240-104655-2), HPT-202_9-13_111518 (240-104655-3), HPT-203_19-23_111518 (240-104655-4), HPT-203_14-18_111518 (240-104655-5), HPT-203_9-13_111518 (240-104655-6), DUP-02_111518 (240-104655-11), TRIP BLANK (240-104655-12) and TRIP BLANK (240-104655-23) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 11/29/2018 and 11/30/2018.

Toluene-d8 (Surr) failed the surrogate recovery criteria low for HPT-203_14-18_111518 (240-104655-5). Refer to the QC report for details.

Vinyl chloride exceeded the RPD limit for the MSD of sample 240-104655-16 in batch 240-357554. Refer to the QC report for details.

Surrogate recovery for the following sample was outside control limits: HPT-203_14-18_111518 (240-104655-5). A secondary analysis

Case Narrative

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

TestAmerica Job ID: 240-104655-1

Job ID: 240-104655-1 (Continued)

Laboratory: TestAmerica Canton (Continued)

was performed outside of holding time with acceptable results.

The pH of the sample(s) was greater than 2. The sample was analyzed within the normal 14 day holding time; however, experimental evidence suggests that some aromatic compounds in wastewater samples, notably, Benzene, Toluene, and Ethylbenzene are susceptible to biological degradation if sample is not preserved to a pH of 2: (240-104655-B-16).

Reanalysis of the following sample was performed outside of the analytical holding time due to sample load: HPT-203_14-18_111518 (240-104655-5).

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 HPT-202_19-23_111518 (240-104655-1), HPT-202_14-18_111518 (240-104655-2), HPT-202_9-13_111518 (240-104655-3), HPT-203_19-23_111518 (240-104655-4), HPT-203_14-18_111518 (240-104655-5), HPT-203_9-13_111518 (240-104655-6), DUP-02_111518 (240-104655-11) and TRIP BLANK (240-104655-23) were analyzed for volatile organic compounds (GCMS SIM) in accordance with EPA SW-846 Method 8260B SIM. The samples were analyzed on 11/27/2018 and 11/28/2018.

1,4-Dioxane exceeded the RPD limit for the MSD of sample 240-104655-16 in batch 240-357181. Refer to the QC report for details.

No additional 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

TestAmerica Job ID: 240-104655-1

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 = 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: 240-104655-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-104655-1	HPT-202_19-23_111518	Water	11/15/18 10:40	11/20/18 09:50
240-104655-2	HPT-202_14-18_111518	Water	11/15/18 11:10	11/20/18 09:50
240-104655-3	HPT-202_9-13_111518	Water	11/15/18 11:30	11/20/18 09:50
240-104655-4	HPT-203_19-23_111518	Water	11/15/18 13:10	11/20/18 09:50
240-104655-5	HPT-203_14-18_111518	Water	11/15/18 13:30	11/20/18 09:50
240-104655-6	HPT-203_9-13_111518	Water	11/15/18 13:50	11/20/18 09:50
240-104655-11	DUP-02_111518	Water	11/15/18 00:00	11/20/18 09:50
240-104655-12	TRIP BLANK	Water	11/15/18 00:00	11/20/18 09:50
240-104655-23	TRIP BLANK	Water	11/16/18 00:00	11/20/18 09:50

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Detection Summary

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

TestAmerica Job ID: 240-104655-1

Client Sample ID: HPT-202_19-23_111518

Lab Sample ID: 240-104655-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	2.5		2.0	0.86	ug/L	1		8260B SIM	Total/NA

Client Sample ID: HPT-202_14-18_111518

Lab Sample ID: 240-104655-2

No Detections.

Client Sample ID: HPT-202_9-13_111518

Lab Sample ID: 240-104655-3

No Detections.

Client Sample ID: HPT-203_19-23_111518

Lab Sample ID: 240-104655-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	3.4		2.0	0.86	ug/L	1		8260B SIM	Total/NA
Vinyl chloride	0.90	J	1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: HPT-203_14-18_111518

Lab Sample ID: 240-104655-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.94	J	2.0	0.86	ug/L	1		8260B SIM	Total/NA

Client Sample ID: HPT-203_9-13_111518

Lab Sample ID: 240-104655-6

No Detections.

Client Sample ID: DUP-02_111518

Lab Sample ID: 240-104655-11

No Detections.

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-104655-12

No Detections.

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-104655-23

No Detections.

This Detection Summary does not include radiochemical test results.

TestAmerica Canton

Client Sample Results

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

TestAmerica Job ID: 240-104655-1

Client Sample ID: HPT-202_19-23_111518

Lab Sample ID: 240-104655-1

Date Collected: 11/15/18 10:40

Matrix: Water

Date Received: 11/20/18 09:50

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.5		2.0	0.86	ug/L			11/27/18 18:36	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	104		63 - 125					11/27/18 18:36	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			11/29/18 13:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			11/29/18 13:57	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			11/29/18 13:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			11/29/18 13:57	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			11/29/18 13:57	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			11/29/18 13:57	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	98		70 - 121					11/29/18 13:57	1
4-Bromofluorobenzene (Surr)	79		59 - 120					11/29/18 13:57	1
Toluene-d8 (Surr)	79		70 - 123					11/29/18 13:57	1
Dibromofluoromethane (Surr)	106		75 - 128					11/29/18 13:57	1

Client Sample Results

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

TestAmerica Job ID: 240-104655-1

Client Sample ID: HPT-202_14-18_111518

Lab Sample ID: 240-104655-2

Date Collected: 11/15/18 11:10

Matrix: Water

Date Received: 11/20/18 09:50

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/27/18 19:02	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	102		63 - 125					11/27/18 19:02	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			11/29/18 14:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			11/29/18 14:19	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			11/29/18 14:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			11/29/18 14:19	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			11/29/18 14:19	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			11/29/18 14:19	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	101		70 - 121					11/29/18 14:19	1
4-Bromofluorobenzene (Surr)	70		59 - 120					11/29/18 14:19	1
Toluene-d8 (Surr)	75		70 - 123					11/29/18 14:19	1
Dibromofluoromethane (Surr)	107		75 - 128					11/29/18 14:19	1

Client Sample Results

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

TestAmerica Job ID: 240-104655-1

Client Sample ID: HPT-202_9-13_111518

Lab Sample ID: 240-104655-3

Date Collected: 11/15/18 11:30

Matrix: Water

Date Received: 11/20/18 09:50

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/27/18 19:28	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	101		63 - 125					11/27/18 19:28	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			11/29/18 14:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			11/29/18 14:41	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			11/29/18 14:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			11/29/18 14:41	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			11/29/18 14:41	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			11/29/18 14:41	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	106		70 - 121					11/29/18 14:41	1
4-Bromofluorobenzene (Surr)	74		59 - 120					11/29/18 14:41	1
Toluene-d8 (Surr)	80		70 - 123					11/29/18 14:41	1
Dibromofluoromethane (Surr)	111		75 - 128					11/29/18 14:41	1

Client Sample Results

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

TestAmerica Job ID: 240-104655-1

Client Sample ID: HPT-203_19-23_111518

Lab Sample ID: 240-104655-4

Date Collected: 11/15/18 13:10

Matrix: Water

Date Received: 11/20/18 09:50

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	3.4		2.0	0.86	ug/L			11/27/18 19:54	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	102		63 - 125					11/27/18 19:54	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			11/29/18 15:03	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			11/29/18 15:03	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			11/29/18 15:03	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			11/29/18 15:03	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			11/29/18 15:03	1
Vinyl chloride	0.90	J	1.0	0.20	ug/L			11/29/18 15:03	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	100		70 - 121					11/29/18 15:03	1
4-Bromofluorobenzene (Surr)	71		59 - 120					11/29/18 15:03	1
Toluene-d8 (Surr)	73		70 - 123					11/29/18 15:03	1
Dibromofluoromethane (Surr)	106		75 - 128					11/29/18 15:03	1

Client Sample Results

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

TestAmerica Job ID: 240-104655-1

Client Sample ID: HPT-203_14-18_111518

Lab Sample ID: 240-104655-5

Date Collected: 11/15/18 13:30

Matrix: Water

Date Received: 11/20/18 09:50

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.94	J	2.0	0.86	ug/L			11/27/18 20:20	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	103		63 - 125					11/27/18 20:20	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			11/29/18 15:25	1
1,1-Dichloroethene	1.0	U H	1.0	0.19	ug/L			11/30/18 18:16	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			11/29/18 15:25	1
cis-1,2-Dichloroethene	1.0	U H	1.0	0.16	ug/L			11/30/18 18:16	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			11/29/18 15:25	1
Tetrachloroethene	1.0	U H	1.0	0.15	ug/L			11/30/18 18:16	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			11/29/18 15:25	1
trans-1,2-Dichloroethene	1.0	U H	1.0	0.19	ug/L			11/30/18 18:16	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			11/29/18 15:25	1
Trichloroethene	1.0	U H	1.0	0.10	ug/L			11/30/18 18:16	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			11/29/18 15:25	1
Vinyl chloride	1.0	U H	1.0	0.20	ug/L			11/30/18 18:16	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	89		70 - 121					11/29/18 15:25	1
1,2-Dichloroethane-d4 (Surr)	102		70 - 121					11/30/18 18:16	1
4-Bromofluorobenzene (Surr)	62		59 - 120					11/29/18 15:25	1
4-Bromofluorobenzene (Surr)	71		59 - 120					11/30/18 18:16	1
Toluene-d8 (Surr)	69	X	70 - 123					11/29/18 15:25	1
Toluene-d8 (Surr)	71		70 - 123					11/30/18 18:16	1
Dibromofluoromethane (Surr)	101		75 - 128					11/29/18 15:25	1
Dibromofluoromethane (Surr)	116		75 - 128					11/30/18 18:16	1

Client Sample Results

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

TestAmerica Job ID: 240-104655-1

Client Sample ID: HPT-203_9-13_111518

Lab Sample ID: 240-104655-6

Date Collected: 11/15/18 13:50

Matrix: Water

Date Received: 11/20/18 09:50

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/27/18 20:46	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	104		63 - 125					11/27/18 20:46	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			11/29/18 15:48	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			11/29/18 15:48	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			11/29/18 15:48	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			11/29/18 15:48	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			11/29/18 15:48	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			11/29/18 15:48	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	100		70 - 121					11/29/18 15:48	1
4-Bromofluorobenzene (Surr)	74		59 - 120					11/29/18 15:48	1
Toluene-d8 (Surr)	77		70 - 123					11/29/18 15:48	1
Dibromofluoromethane (Surr)	109		75 - 128					11/29/18 15:48	1

Client Sample Results

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

TestAmerica Job ID: 240-104655-1

Client Sample ID: DUP-02_111518

Lab Sample ID: 240-104655-11

Date Collected: 11/15/18 00:00

Matrix: Water

Date Received: 11/20/18 09:50

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/27/18 22:54	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	103		63 - 125					11/27/18 22:54	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			11/29/18 17:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			11/29/18 17:38	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			11/29/18 17:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			11/29/18 17:38	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			11/29/18 17:38	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			11/29/18 17:38	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	97		70 - 121					11/29/18 17:38	1
4-Bromofluorobenzene (Surr)	69		59 - 120					11/29/18 17:38	1
Toluene-d8 (Surr)	76		70 - 123					11/29/18 17:38	1
Dibromofluoromethane (Surr)	106		75 - 128					11/29/18 17:38	1

Client Sample Results

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

TestAmerica Job ID: 240-104655-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-104655-12

Date Collected: 11/15/18 00:00

Matrix: Water

Date Received: 11/20/18 09:50

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			11/29/18 18:00	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			11/29/18 18:00	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			11/29/18 18:00	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			11/29/18 18:00	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			11/29/18 18:00	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			11/29/18 18:00	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	102		70 - 121		11/29/18 18:00	1
4-Bromofluorobenzene (Surr)	75		59 - 120		11/29/18 18:00	1
Toluene-d8 (Surr)	79		70 - 123		11/29/18 18:00	1
Dibromofluoromethane (Surr)	114		75 - 128		11/29/18 18:00	1

Client Sample Results

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

TestAmerica Job ID: 240-104655-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-104655-23

Date Collected: 11/16/18 00:00

Matrix: Water

Date Received: 11/20/18 09:50

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			11/28/18 13:48	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	99		63 - 125					11/28/18 13:48	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			11/30/18 14:56	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			11/30/18 14:56	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			11/30/18 14:56	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			11/30/18 14:56	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			11/30/18 14:56	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			11/30/18 14:56	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	104		70 - 121					11/30/18 14:56	1
4-Bromofluorobenzene (Surr)	74		59 - 120					11/30/18 14:56	1
Toluene-d8 (Surr)	78		70 - 123					11/30/18 14:56	1
Dibromofluoromethane (Surr)	119		75 - 128					11/30/18 14:56	1

Surrogate Summary

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

TestAmerica Job ID: 240-104655-1

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)
240-104555-B-2 MS	Matrix Spike	94	89	85	107
240-104555-B-2 MSD	Matrix Spike Duplicate	101	87	81	108
240-104655-1	HPT-202_19-23_111518	98	79	79	106
240-104655-2	HPT-202_14-18_111518	101	70	75	107
240-104655-3	HPT-202_9-13_111518	106	74	80	111
240-104655-4	HPT-203_19-23_111518	100	71	73	106
240-104655-5	HPT-203_14-18_111518	89	62	69 X	101
240-104655-5	HPT-203_14-18_111518	102	71	71	116
240-104655-6	HPT-203_9-13_111518	100	74	77	109
240-104655-11	DUP-02_111518	97	69	76	106
240-104655-12	TRIP BLANK	102	75	79	114
240-104655-23	TRIP BLANK	104	74	78	119
240-104655-E-16 MSD	Matrix Spike Duplicate	93	82	83	109
240-104655-H-16 MS	Matrix Spike	97	86	80	103
LCS 240-357554/4	Lab Control Sample	93	88	78	102
LCS 240-357757/4	Lab Control Sample	93	81	82	105
MB 240-357554/6	Method Blank	104	81	82	117
MB 240-357757/6	Method Blank	105	77	82	116

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)
240-104655-1	HPT-202_19-23_111518	104
240-104655-2	HPT-202_14-18_111518	102
240-104655-3	HPT-202_9-13_111518	101
240-104655-4	HPT-203_19-23_111518	102
240-104655-5	HPT-203_14-18_111518	103
240-104655-6	HPT-203_9-13_111518	104
240-104655-11	DUP-02_111518	103
240-104655-23	TRIP BLANK	99
240-104655-F-16 MS	Matrix Spike	99
240-104655-F-16 MSD	Matrix Spike Duplicate	101
240-104655-F-19 MS	Matrix Spike	102
240-104655-F-19 MSD	Matrix Spike Duplicate	101
LCS 240-357181/4	Lab Control Sample	100
LCS 240-357403/4	Lab Control Sample	100
MB 240-357181/5	Method Blank	101
MB 240-357403/5	Method Blank	99

Surrogate Legend

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

TestAmerica Canton

QC Sample Results

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

TestAmerica Job ID: 240-104655-1

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

Lab Sample ID: MB 240-357554/6

Matrix: Water

Analysis Batch: 357554

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			11/29/18 10:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			11/29/18 10:38	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			11/29/18 10:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			11/29/18 10:38	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			11/29/18 10:38	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			11/29/18 10:38	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	104		70 - 121		11/29/18 10:38	1
4-Bromofluorobenzene (Surr)	81		59 - 120		11/29/18 10:38	1
Toluene-d8 (Surr)	82		70 - 123		11/29/18 10:38	1
Dibromofluoromethane (Surr)	117		75 - 128		11/29/18 10:38	1

Lab Sample ID: LCS 240-357554/4

Matrix: Water

Analysis Batch: 357554

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	8.91		ug/L		89	65 - 139
cis-1,2-Dichloroethene	10.0	9.70		ug/L		97	76 - 128
Tetrachloroethene	10.0	11.4		ug/L		114	74 - 130
trans-1,2-Dichloroethene	10.0	9.39		ug/L		94	78 - 133
Trichloroethene	10.0	11.2		ug/L		112	76 - 125
Vinyl chloride	10.0	8.03		ug/L		80	58 - 143

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	93		70 - 121
4-Bromofluorobenzene (Surr)	88		59 - 120
Toluene-d8 (Surr)	78		70 - 123
Dibromofluoromethane (Surr)	102		75 - 128

Lab Sample ID: 240-104655-E-16 MSD

Matrix: Water

Analysis Batch: 357554

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	9.06		ug/L		91	53 - 140	31	35
cis-1,2-Dichloroethene	1.0	U	10.0	9.83		ug/L		98	64 - 130	9	21
Tetrachloroethene	1.0	U	10.0	11.6		ug/L		116	51 - 136	18	23
trans-1,2-Dichloroethene	1.0	U	10.0	9.96		ug/L		100	68 - 133	19	24
Trichloroethene	1.0	U	10.0	10.7		ug/L		107	55 - 131	7	23
Vinyl chloride	1.0	U F2	10.0	7.53	F2	ug/L		75	43 - 154	35	29

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	93		70 - 121
4-Bromofluorobenzene (Surr)	82		59 - 120
Toluene-d8 (Surr)	83		70 - 123

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QC Sample Results

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

TestAmerica Job ID: 240-104655-1

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

Lab Sample ID: 240-104655-E-16 MSD
Matrix: Water
Analysis Batch: 357554

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

Surrogate	MSD		Limits
	%Recovery	Qualifier	
Dibromofluoromethane (Surr)	109		75 - 128

Lab Sample ID: 240-104655-H-16 MS
Matrix: Water
Analysis Batch: 357554

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

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec. Limits
	Result	Qualifier		Result	Qualifier				
1,1-Dichloroethene	1.0	U	10.0	6.66		ug/L		67	53 - 140
cis-1,2-Dichloroethene	1.0	U	10.0	9.01		ug/L		90	64 - 130
Tetrachloroethene	1.0	U	10.0	9.72		ug/L		97	51 - 136
trans-1,2-Dichloroethene	1.0	U	10.0	8.24		ug/L		82	68 - 133
Trichloroethene	1.0	U	10.0	9.97		ug/L		100	55 - 131
Vinyl chloride	1.0	U F2	10.0	5.29		ug/L		53	43 - 154

Surrogate	MS		Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	97		70 - 121
4-Bromofluorobenzene (Surr)	86		59 - 120
Toluene-d8 (Surr)	80		70 - 123
Dibromofluoromethane (Surr)	103		75 - 128

Lab Sample ID: MB 240-357757/6
Matrix: Water
Analysis Batch: 357757

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

Analyte	MB	MB	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			11/30/18 11:36	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			11/30/18 11:36	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			11/30/18 11:36	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			11/30/18 11:36	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			11/30/18 11:36	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			11/30/18 11:36	1

Surrogate	MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
1,2-Dichloroethane-d4 (Surr)	105		70 - 121		11/30/18 11:36	1
4-Bromofluorobenzene (Surr)	77		59 - 120		11/30/18 11:36	1
Toluene-d8 (Surr)	82		70 - 123		11/30/18 11:36	1
Dibromofluoromethane (Surr)	116		75 - 128		11/30/18 11:36	1

Lab Sample ID: LCS 240-357757/4
Matrix: Water
Analysis Batch: 357757

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

Analyte	Spike	LCS	LCS	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.16		ug/L		92	65 - 139
cis-1,2-Dichloroethene	10.0	10.6		ug/L		106	76 - 128
Tetrachloroethene	10.0	12.4		ug/L		124	74 - 130
trans-1,2-Dichloroethene	10.0	10.7		ug/L		107	78 - 133

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QC Sample Results

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

TestAmerica Job ID: 240-104655-1

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

Lab Sample ID: LCS 240-357757/4
Matrix: Water
Analysis Batch: 357757

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Trichloroethene	10.0	11.6		ug/L		116	76 - 125
Vinyl chloride	10.0	7.02		ug/L		70	58 - 143

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	93		70 - 121
4-Bromofluorobenzene (Surr)	81		59 - 120
Toluene-d8 (Surr)	82		70 - 123
Dibromofluoromethane (Surr)	105		75 - 128

Lab Sample ID: 240-104555-B-2 MS
Matrix: Water
Analysis Batch: 357757

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

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	94		70 - 121
4-Bromofluorobenzene (Surr)	89		59 - 120
Toluene-d8 (Surr)	85		70 - 123
Dibromofluoromethane (Surr)	107		75 - 128

Lab Sample ID: 240-104555-B-2 MSD
Matrix: Water
Analysis Batch: 357757

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

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	101		70 - 121
4-Bromofluorobenzene (Surr)	87		59 - 120
Toluene-d8 (Surr)	81		70 - 123
Dibromofluoromethane (Surr)	108		75 - 128

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

Lab Sample ID: MB 240-357181/5
Matrix: Water
Analysis Batch: 357181

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			11/27/18 13:01	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	101		63 - 125		11/27/18 13:01	1

Lab Sample ID: LCS 240-357181/4
Matrix: Water
Analysis Batch: 357181

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	9.30		ug/L		93	59 - 131

TestAmerica Canton

QC Sample Results

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

TestAmerica Job ID: 240-104655-1

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	100		63 - 125

Lab Sample ID: 240-104655-F-16 MS
Matrix: Water
Analysis Batch: 357181

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 F2	3.33	3.68		ug/L		110	52 - 129

	MS	MS	
Surrogate	%Recovery	Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	99		63 - 125

Lab Sample ID: 240-104655-F-16 MSD
Matrix: Water
Analysis Batch: 357181

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
1,4-Dioxane	2.0	U F2	10.0	10.7	F4	ug/L		107	52 - 129	98	13

	MSD	MSD	
Surrogate	%Recovery	Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	101		63 - 125

Lab Sample ID: MB 240-357403/5
Matrix: Water
Analysis Batch: 357403

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			11/28/18 12:57	1

	MB	MB							
Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac			
1,2-Dichloroethane-d4 (Surr)	99		63 - 125		11/28/18 12:57	1			

Lab Sample ID: LCS 240-357403/4
Matrix: Water
Analysis Batch: 357403

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	9.48		ug/L		95	59 - 131

	LCS	LCS	
Surrogate	%Recovery	Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	100		63 - 125

Lab Sample ID: 240-104655-F-19 MS
Matrix: Water
Analysis Batch: 357403

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	9.58		ug/L		96	52 - 129

	MS	MS	
Surrogate	%Recovery	Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	102		63 - 125

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QC Sample Results

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

TestAmerica Job ID: 240-104655-1

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

Lab Sample ID: 240-104655-F-19 MSD
Matrix: Water
Analysis Batch: 357403

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
1,4-Dioxane	2.0	U	10.0	10.4		ug/L		104	52 - 129	8	13
Surrogate	%Recovery	MSD Qualifier	Limits								
1,2-Dichloroethane-d4 (Surr)	101		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

TestAmerica Job ID: 240-104655-1

GC/MS VOA

Analysis Batch: 357181

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-104655-1	HPT-202_19-23_111518	Total/NA	Water	8260B SIM	
240-104655-2	HPT-202_14-18_111518	Total/NA	Water	8260B SIM	
240-104655-3	HPT-202_9-13_111518	Total/NA	Water	8260B SIM	
240-104655-4	HPT-203_19-23_111518	Total/NA	Water	8260B SIM	
240-104655-5	HPT-203_14-18_111518	Total/NA	Water	8260B SIM	
240-104655-6	HPT-203_9-13_111518	Total/NA	Water	8260B SIM	
240-104655-11	DUP-02_111518	Total/NA	Water	8260B SIM	
MB 240-357181/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-357181/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-104655-F-16 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-104655-F-16 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 357403

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-104655-23	TRIP BLANK	Total/NA	Water	8260B SIM	
MB 240-357403/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-357403/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-104655-F-19 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-104655-F-19 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 357554

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-104655-1	HPT-202_19-23_111518	Total/NA	Water	8260B	
240-104655-2	HPT-202_14-18_111518	Total/NA	Water	8260B	
240-104655-3	HPT-202_9-13_111518	Total/NA	Water	8260B	
240-104655-4	HPT-203_19-23_111518	Total/NA	Water	8260B	
240-104655-5	HPT-203_14-18_111518	Total/NA	Water	8260B	
240-104655-6	HPT-203_9-13_111518	Total/NA	Water	8260B	
240-104655-11	DUP-02_111518	Total/NA	Water	8260B	
240-104655-12	TRIP BLANK	Total/NA	Water	8260B	
MB 240-357554/6	Method Blank	Total/NA	Water	8260B	
LCS 240-357554/4	Lab Control Sample	Total/NA	Water	8260B	
240-104655-E-16 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
240-104655-H-16 MS	Matrix Spike	Total/NA	Water	8260B	

Analysis Batch: 357757

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-104655-5	HPT-203_14-18_111518	Total/NA	Water	8260B	
240-104655-23	TRIP BLANK	Total/NA	Water	8260B	
MB 240-357757/6	Method Blank	Total/NA	Water	8260B	
LCS 240-357757/4	Lab Control Sample	Total/NA	Water	8260B	
240-104555-B-2 MS	Matrix Spike	Total/NA	Water	8260B	
240-104555-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Lab Chronicle

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

TestAmerica Job ID: 240-104655-1

Client Sample ID: HPT-202_19-23_111518

Lab Sample ID: 240-104655-1

Date Collected: 11/15/18 10:40

Matrix: Water

Date Received: 11/20/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	357554	11/29/18 13:57	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	357181	11/27/18 18:36	SAM	TAL CAN

Client Sample ID: HPT-202_14-18_111518

Lab Sample ID: 240-104655-2

Date Collected: 11/15/18 11:10

Matrix: Water

Date Received: 11/20/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	357554	11/29/18 14:19	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	357181	11/27/18 19:02	SAM	TAL CAN

Client Sample ID: HPT-202_9-13_111518

Lab Sample ID: 240-104655-3

Date Collected: 11/15/18 11:30

Matrix: Water

Date Received: 11/20/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	357554	11/29/18 14:41	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	357181	11/27/18 19:28	SAM	TAL CAN

Client Sample ID: HPT-203_19-23_111518

Lab Sample ID: 240-104655-4

Date Collected: 11/15/18 13:10

Matrix: Water

Date Received: 11/20/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	357554	11/29/18 15:03	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	357181	11/27/18 19:54	SAM	TAL CAN

Client Sample ID: HPT-203_14-18_111518

Lab Sample ID: 240-104655-5

Date Collected: 11/15/18 13:30

Matrix: Water

Date Received: 11/20/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	357554	11/29/18 15:25	LEE	TAL CAN
Total/NA	Analysis	8260B		1	357757	11/30/18 18:16	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	357181	11/27/18 20:20	SAM	TAL CAN

TestAmerica Canton

Lab Chronicle

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

TestAmerica Job ID: 240-104655-1

Client Sample ID: HPT-203_9-13_111518

Lab Sample ID: 240-104655-6

Date Collected: 11/15/18 13:50

Matrix: Water

Date Received: 11/20/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	357554	11/29/18 15:48	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	357181	11/27/18 20:46	SAM	TAL CAN

Client Sample ID: DUP-02_111518

Lab Sample ID: 240-104655-11

Date Collected: 11/15/18 00:00

Matrix: Water

Date Received: 11/20/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	357554	11/29/18 17:38	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	357181	11/27/18 22:54	SAM	TAL CAN

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-104655-12

Date Collected: 11/15/18 00:00

Matrix: Water

Date Received: 11/20/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	357554	11/29/18 18:00	LEE	TAL CAN

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-104655-23

Date Collected: 11/16/18 00:00

Matrix: Water

Date Received: 11/20/18 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	357757	11/30/18 14:56	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	357403	11/28/18 13:48	SAM	TAL CAN

Laboratory References:

TAL CAN = 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

TestAmerica Job ID: 240-104655-1

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.

Regulatory Program: DW NPDES RCRA Other:

Project Manager: KRIS HUSKEY
 Tel/Fax: 264-519-5402
 Analysis Turnaround Time: WORKING DAYS CALENDAR DAYS
 TAT if different from Below: STANDARD
 2 weeks 1 week 2 days 1 day

Company Name: ARCADIS
 Address: 28550 CABOT DR, NOVI, MI 48217
 City/State/Zip: Livonia, MI 48150
 Phone: 248-994-2240
 Fax: 248-994-2241
 Project Name: FORD LTP
 Site: OFF-SITE LOW-SITE
 P.O.#: MIO01454.0002.0002B

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	# of Cont.	Matrix	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	Date	Carrier	COC No.	Sampler: KALANJ BEIGGS	For Lab Use Only:	Walk-in Client:	Lab Sampling:	Job / SDG No.:	Sample Specific Notes:
HPT-202-19-23-11518	11-15-18	1040	G	6	GW	N	N			1						
HPT-202-14-18-11518	11-15-18	1110	G	6	GW	N	N			3						
HPT-202-9-13-11518	11-15-18	1130	G	6	GW	N	N									
HPT-203-19-23-11518	11-15-18	1310	G	6	GW	N	N									
HPT-203-14-18-11518	11-15-18	1330	G	6	GW	N	N									
HPT-203-9-13-11518	11-15-18	1350	G	6	GW	N	N									
HPT-192-18-22-11518	11-15-18	1535	G	6	GW	N	N									
HPT-191-19-23-11518	11-15-18	1540	G	6	GW	N	N									
HPT-192-13-17-11518	11-15-18	1555	G	6	GW	N	N									
HPT-191-13-17-11518	11-15-18	1600	G	6	GW	N	N									
DUP-02-11518	-	-	G	6	GW	N	N									
TRIP BLANK	-	-	-	1	W	N	N									



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/ICQ Requirements & Comments: ANALYZE SAMPLES FOR: 1,1-DCE, cis-1,2-DCE, TRANS-1,2-DCE, PCE, TCE, AND VINYL CHLORIDE VIA USEPA METHOD 8260B AND 44-DIAGNOSIS VIA USEPA METHOD 8260B-SIM. SUBMIT ALL SAMPLES RESULTS THROUGH CADENA AT Jim.Tomalia@CADENA.COM #C203631

Company: ARCADIS
 Date/Time: 11/17/18 1300
 Received by: [Signature]

Company: ARCADIS
 Date/Time: 11/17/18 1247
 Received by: [Signature]

Company: ARCADIS
 Date/Time: 11/19/18 1335
 Received by: [Signature]

Company: ARCADIS
 Date/Time: 11/17/18 1300
 Received by: [Signature]

Company: TRC
 Date/Time: 11/19/18 1247
 Received by: [Signature]

Company: TRC
 Date/Time: 11/20/18 950
 Received by: [Signature]

TestAmerica Michigan
 10448 Citation Drive
 Suite 200
 Brighton, MI 48116
 Phone: 810.229.2763 Fax:

MICHIGAN
 190 1.8.2.7 2.1.3.3

Chain of Custody Record
 287570 2.6.3.5

TestAmerica
 THE LEADER IN ENVIRONMENTAL TESTING
 TestAmerica Laboratories, Inc.
 TAL-8210 (0713)

Regulatory Program: DW NPDES RCRA Other:

Client Contact
 Company Name: **ARCADIS**
 Address: **28550 CABOT DR #500**
 City/State/Zip: **Novi, MI 48377**
 Phone: **248-994-2240**
 Fax: **248-994-2241**
 Project Name: **FOOD LTP**
 Site: **OFF-SITE / ON-SITE**
 PO # **MI0014540002-00002B**

Project Manager: **YVES KIWISKEY**
 Tel/Fax: **269-519-5402**
 Analysis Turnaround Time
 CALENDAR DAYS WORKING DAYS
 TAT, if different from Below: **STANDARD**
 2 weeks
 1 week
 2 days
 1 day

Site Contact:
 Lab Contact: **SEE BELOW**
 Date: **11/17/18**
 Carrier: **ARCADIS**

COC No: **7**
 of **3** COCs
 Sampler: **KAYAN BRIGGS**
 For Lab Use Only:
 Walk-in Client:
 Lab Sampling:
 Job / SDG No.:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	Sample Specific Notes:
HPT-192-8-12-111518	11-5-18	1610	G	GW	6	N	X	
HPT-191-8-12-111518	11-5-18	1615	G	GW	6	N	X	
HPT-193-19-23-111518	11-5-18	1800	G	GW	6	N	X	
HPT-193-14-18-111518	11-5-18	1815	G	GW	18	N	X	
HPT-193-9-13-111518	11-5-18	1830	G	GW	6	N	X	
HPT-189-16-20-111618	11-6-18	1040	G	GW	6	N	X	
HPT-189-10-14-111618	11-6-18	1055	G	GW	18	N	X	
HPT-188-18-22-111618	11-6-18	1110	G	GW	6	N	X	
HPT-189-4-8-111618	11-6-18	1125	G	GW	6	N	X	
HPT-188-9-13-111618	11-6-18	1135	G	GW	6	N	X	
TRIP BLANK	11-16-18		-	W	2	N	X	
DUP-03-111618	11-16-18		G	GW	6	N	X	

Preservation Used: 1=Ice, 2=HCl, 3=H2SO4, 4=HNO3, 5=NaOH, 6=Other

Possible Hazard Identification: Non-Hazard Flammable Skin Irritant Poison B Unknown

Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.

Special Instructions/QC Requirements & Comments: **ANALYZE SAMPLES FOR: V1-DCE, V12-DCE, V12-DCE, V12-DCE, AND V17-L CHLORIDE VIA USEPA METHOD 8260B AND 14-BYWAY VIA USEPA METHOD 8260B-SIM. SUBMIT ALL SAMPLE RESULTS THROUGH CADEWA AT SIM.TOMALLA@CADEWA.COM #FC2036031**

Custody Seals Intact: Yes No

Relinquished by: **YVES KIWISKEY**
 Relinquished by: **NOVICOLD STORAGE**
 Relinquished by: **YVES KIWISKEY**

Company: **ARCADIS**
 Date/Time: **11/17/18 1200**
 Received by: **NOVICOLD STORAGE**

Company: **ARCADIS**
 Date/Time: **11/14/18 1247**
 Received by: **YVES KIWISKEY**

Company: **ARCADIS**
 Date/Time: **11/14/18 13:58**
 Received by: **YVES KIWISKEY**

Company: **ARCADIS**
 Date/Time: **11/17/18 1300**
 Received by: **NOVICOLD STORAGE**

Company: **ARCADIS**
 Date/Time: **11/19/18 12:47**
 Received by: **YVES KIWISKEY**

Company: **ARCADIS**
 Date/Time: **11/20/18 950**
 Received by: **YVES KIWISKEY**

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return to Client Disposal by Lab Archive for _____ Months

Cooler Temp. (°C): Obs'd: _____ Cor'd: _____ Therm ID No.:



Regulatory Program: DW NPDES RCRA Other:

Client Contact
Company Name: **ARCADIS**
Address: **28550 CABOT DR # 500**
City/State/Zip: **ANN ARBOR MI 48106**
Phone: **248-994-2240**
Fax: **248-994-2241**
Project Name: **FORD LTP**
Site: **RESERVE / ON-SITE**
PO # **MI001454.0002.0002B**

Project Manager: **KRIS HUSKEY**
Tel/Fax: **269-519-5402**
Analysis Turnaround Time
 CALENDAR DAYS WORKING DAYS
TAT if different from Below **STANDARD**
 2 weeks
 1 week
 2 days
 1 day

Site Contact: **SEE BELOW**
Lab Contact: **SEE BELOW**
Date: **11/17/18**
Carrier: **ARCADIS**

COC No: **3** of **3** COCs
Sampler: **KALAN BRUGG**
For Lab Use Only:
Walk-in Client:
Lab Sampling:
Job / SDG No.:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	Sample Specific Notes:
HPT-188-4-8-111618	11-16-18	1150	G	GW	6	N	N	
HPT-187-15-19-111618	11-16-18	1455	G	GW	6	N	N	
HPT-190-16-20-111618	11-16-18	1510	G	GW	6	N	N	
HPT-187-8-12-111618	11-16-18	1515	G	GW	6	N	N	
HPT-190-10-14-111618	11-16-18	1525	G	GW	6	N	N	
HPT-187-3-7-111618	11-16-18	1530	G	GW	6	N	N	
HPT-190-5-9-111618	11-16-18	1545	G	GW	6	N	N	

Preservation Used: 1= Ice, 2= HCl; 3= H2SO4; 4= HNO3; 5= NaOH; 6= Other

Possible Hazard Identification: Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample.
 Non-Hazard Flammable Skin Irritant Poison B Unknown

Special Instructions/QC Requirements & Comments: **ANALYZE SAMPLES FOR: 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, PCE, TCE, AND VINYL CHLORIDE VIA USEPA METHOD 8260B AND 1,4-DIOXANE VIA USEPA METHOD 8260B-SIM. SUBMIT ALL SAMPLE RESULTS THROUGH CADENA AT JIM.TOMALIA@CADENA.COM #E203631**

Custody Seals Intact: Yes No
Custody Seal No.:
Company: **ARCADIS**
Date/Time: **11/17/18 1200**
Received by: **NOVI COLD STORAGE**
Company: **ARCADIS**
Date/Time: **11/17/18 12:47**
Received by: **THC**
Company: **THC**
Date/Time: **11/19/18 13:29**
Received by: **THC**
Company: **THC**
Date/Time: **11/20/18 9:50**

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return to Client Disposal by Lab Archive for _____ Months



TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility


Login #: 104455

Client Arcoadis Site Name _____ Cooler unpacked by: DSD
 Cooler Received on 11/20/18 Opened on 11/20/18

FedEx: 1st 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 See Multiple Cooler Form
 IR GUN# IR-8 (CF +0.9 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
 IR GUN #36 (CF +0.6 °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 each 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# HC850248
13. Were VOAs on the COC? Yes No
14. Were air bubbles >6 mm in any VOA vials? Yes No NA  Larger than this.
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # N/A 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: POP

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): _____

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

TestAmerica Multiple Cooler Receipt Form/Narrative		Login #: 10-1655		
Canton Facility				
Cooler #	IR Gun #	Observed Temp °C	Corrected Temp °C	Coolant
TA	8	1.8	2.7	FCC
↓	↓	2.4	3.3	(b)
		2.6	3.5	

X:\X-Drive Document Control\SOPs\Work Instructions\Word Version Work Instructions\WT-NC-099H-071615 Cooler Receipt Form_page 2 - Multiple Coolers.doc.rls



January 16, 2019

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: 104655-1
Sample date: 2018-11-15
Report received by CADENA: 2019-01-16
Initial Data Verification completed by CADENA: 2019-01-16

The following minor QC exceptions or missing information were noted:

SPV - SIM 1,4-DIOXANE samples -004 preservation non-compliance as noted in the laboratory submittal should render all associated results as estimated and qualified with J flags if detected and UJ flags if non-detect.

SUR - GCMS VOC sample -005 surrogate recovery was outlying biased low but greater than 10% for at least 1 out of 4 surrogates. These client sample results should be considered to be estimated and qualified with J flags if detected and UJ flags if non-detect. Samples -005 was re-analyzed out of hold times, showing some improvement. Both sets of data are reported for this samples.

GCMS VOC and SIM QC batch MS/MSD recovery outliers or RPD outliers were not determined using a client sample so qualification was not required based on these sample-specific QC outliers.

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.

9 Water sample(s) were analyzed for GCMS VOC parameter(s).

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, MS/MSD Recovery, MS/MSD RPD, 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 <http://clms.cadenaco.com/index.cfm>.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	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 contaminants) 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 contaminants) 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.

SAMPLING AND ANALYSIS SUMMARY

CADENA Project ID: E203631

Laboratory: TestAmerica-North Canton

Laboratory Submittal: 104655-1

Lab Sample ID	Sample ID	Collection Date (mm/yy/dd)	Collection Time (hh:mm:ss)	Volatile Organics by GCMS	8260B with Single Ion Monitoring	Comment
2401046551	HPT-202_19-23_111518	11/15/2018	10:40:00	X	X	
24010465511	DUP-02_111518	11/15/2018	12:00:00	X	X	
24010465512	TRIP BLANK	11/16/2018	12:00:00	X		
2401046552	HPT-202_14-18_111518	11/15/2018	11:10:00	X	X	
24010465523	TRIP BLANK	11/16/2018	12:00:00	X	X	
2401046553	HPT-202_9-13_111518	11/15/2018	11:30:00	X	X	
2401046554	HPT-203_19-23_111518	11/15/2018	1:10:00	X	X	
2401046555	HPT-203_14-18_111518	11/15/2018	1:30:00	X	X	
2401046556	HPT-203_9-13_111518	11/15/2018	1:50:00	X	X	

Qualified Results Summary

CADENA Project ID: E203631

Laboratory: TestAmerica - North Canton

Laboratory Submittal: 104655-1

Sample Name:	HPT-203_19-23_111518	HPT-203_14-18_111518
Lab Sample ID:	2401046554	2401046555
Sample Date:	11/15/2018	11/15/2018

Analyte	Cas No.	Report		Valid		Report		Valid	
		Result	Limit	Units	Qualifier	Result	Limit	Units	Qualifier
GC/MS VOC									
<u>OSW-8260B</u>									
1,1-Dichloroethene	75-35-4					ND	1.0	ug/l	UJ
cis-1,2-Dichloroethene	156-59-2					ND	1.0	ug/l	UJ
Tetrachloroethene	127-18-4					ND	1.0	ug/l	UJ
trans-1,2-Dichloroethene	156-60-5					ND	1.0	ug/l	UJ
Trichloroethene	79-01-6					ND	1.0	ug/l	UJ
Vinyl chloride	75-01-4					ND	1.0	ug/l	UJ
<u>OSW-8260BBSim</u>									
1,4-Dioxane	123-91-1	3.4	2.0	ug/l	J				

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631

Laboratory: TestAmerica - North Canton

Laboratory Submittal: 104655-1

Analyte	Cas No.	HPT-202_19-23_111518				DUP-02_111518				TRIP BLANK				HPT-202_14-18_111518				TRIP BLANK				HPT-202_9-13_111518				HPT-203_19-23_111518				HPT-203_14-18_111518				HPT-203_9-13_111518			
		Result	Limit	Units	Qualifier	Result	Limit	Units	Qualifier	Result	Limit	Units	Qualifier	Result	Limit	Units	Qualifier	Result	Limit	Units	Qualifier	Result	Limit	Units	Qualifier	Result	Limit	Units	Qualifier	Result	Limit	Units	Qualifier	Result	Limit	Units	Qualifier
GC/MS VOC																																					
<u>OSW-8260B</u>																																					
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	ND	1.0	ug/l	---	0.90	1.0	ug/l	J	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---
<u>OSW-8260BBSim</u>																																					
1,4-Dioxane	123-91-1	2.5	2.0	ug/l	---	ND	2.0	ug/l	---					ND	2.0	ug/l	---	ND	2.0	ug/l	---	ND	2.0	ug/l	---	3.4	2.0	ug/l	J	0.94	2.0	ug/l	J	ND	2.0	ug/l	---