

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Canton
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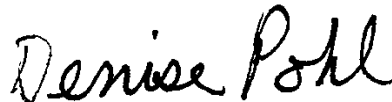
TestAmerica Job ID: 240-91418-1

Client Project/Site: Ford LTP Livonia MI - E203728

For:

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

Attn: Kristoffer Hinskey



Authorized for release by:
2/22/2018 4:17:23 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 - E203728

TestAmerica Job ID: 240-91418-1

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.
*	LCS or LCSD is outside acceptance limits.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203728

TestAmerica Job ID: 240-91418-1

Job ID: 240-91418-1

Laboratory: TestAmerica Canton

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: Ford LTP Livonia MI - E203728

Report Number: 240-91418-1

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.

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 2/13/2018 9:20 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.9° C.

VOLATILE ORGANIC COMPOUNDS (GCMS)

Samples MW-57_020918 (240-91418-1), MW-64_020918 (240-91418-2) and TRIP BLANK (240-91418-3) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 02/16/2018.

1,4-Dioxane failed the recovery criteria high for LCS 240-315090/4. Refer to the QC report for details.

Method(s) 8260B: The laboratory control sample (LCS) for analytical batch 240-315090 recovered outside control limits for the following analyte: 1,4-Dioxane. This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data has been reported: MW-57_020918 (240-91418-1), MW-64_020918 (240-91418-2), TRIP BLANK (240-91418-3) and (LCS 240-315090/4).

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-57_020918 (240-91418-1) and MW-64_020918 (240-91418-2) were analyzed for volatile organic compounds (GCMS SIM) in

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203728

TestAmerica Job ID: 240-91418-1

Job ID: 240-91418-1 (Continued)

Laboratory: TestAmerica Canton (Continued)

accordance with EPA SW-846 Method 8260B SIM. The samples were analyzed on 02/19/2018.

Method(s) 8260B SIM: The pH is greater than 2 for the following sample: (240-91428-C-6 MSD).

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

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Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203728

TestAmerica Job ID: 240-91418-1

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

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 - E203728

TestAmerica Job ID: 240-91418-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-91418-1	MW-57_020918	Water	02/09/18 11:40	02/13/18 09:20
240-91418-2	MW-64_020918	Water	02/09/18 12:55	02/13/18 09:20
240-91418-3	TRIP BLANK	Water	02/09/18 00:00	02/13/18 09:20

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Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203728

TestAmerica Job ID: 240-91418-1

Client Sample ID: MW-57_020918

Lab Sample ID: 240-91418-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	4.9		2.0	0.24	ug/L	1		8260B SIM	Total/NA
Vinyl chloride	0.59	J	1.0	0.45	ug/L	1		8260B	Total/NA

Client Sample ID: MW-64_020918

Lab Sample ID: 240-91418-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	0.30	J	1.0	0.30	ug/L	1		8260B	Total/NA
Vinyl chloride	6.7		1.0	0.45	ug/L	1		8260B	Total/NA

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-91418-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Acetone	3.0	J	10	1.8	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

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Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203728

TestAmerica Job ID: 240-91418-1

Client Sample ID: MW-57_020918

Lab Sample ID: 240-91418-1

Date Collected: 02/09/18 11:40

Matrix: Water

Date Received: 02/13/18 09:20

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	4.9		2.0	0.24	ug/L			02/19/18 16:43	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	109		63 - 125					02/19/18 16:43	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	10	1.8	ug/L			02/16/18 18:19	1
Benzene	1.0	U	1.0	0.28	ug/L			02/16/18 18:19	1
Bromodichloromethane	1.0	U	1.0	0.30	ug/L			02/16/18 18:19	1
Bromoform	1.0	U	1.0	0.43	ug/L			02/16/18 18:19	1
Bromomethane	1.0	U	1.0	0.42	ug/L			02/16/18 18:19	1
2-Butanone (MEK)	10	U	10	1.0	ug/L			02/16/18 18:19	1
Carbon disulfide	5.0	U	5.0	0.34	ug/L			02/16/18 18:19	1
Carbon tetrachloride	1.0	U	1.0	0.35	ug/L			02/16/18 18:19	1
Chlorobenzene	1.0	U	1.0	0.32	ug/L			02/16/18 18:19	1
Chloroethane	1.0	U	1.0	0.41	ug/L			02/16/18 18:19	1
Chloroform	1.0	U	1.0	0.31	ug/L			02/16/18 18:19	1
Chloromethane	1.0	U	1.0	0.43	ug/L			02/16/18 18:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.30	ug/L			02/16/18 18:19	1
cis-1,3-Dichloropropene	1.0	U	1.0	0.26	ug/L			02/16/18 18:19	1
Cyclohexane	1.0	U	1.0	0.44	ug/L			02/16/18 18:19	1
Dibromochloromethane	1.0	U	1.0	0.25	ug/L			02/16/18 18:19	1
1,2-Dibromo-3-Chloropropane	1.0	U	1.0	0.47	ug/L			02/16/18 18:19	1
1,2-Dibromoethane	1.0	U	1.0	0.23	ug/L			02/16/18 18:19	1
1,2-Dichlorobenzene	1.0	U	1.0	0.26	ug/L			02/16/18 18:19	1
1,3-Dichlorobenzene	1.0	U	1.0	0.32	ug/L			02/16/18 18:19	1
1,4-Dichlorobenzene	1.0	U	1.0	0.23	ug/L			02/16/18 18:19	1
Dichlorodifluoromethane	1.0	U	1.0	0.50	ug/L			02/16/18 18:19	1
1,1-Dichloroethane	1.0	U	1.0	0.25	ug/L			02/16/18 18:19	1
1,2-Dichloroethane	1.0	U	1.0	0.30	ug/L			02/16/18 18:19	1
1,1-Dichloroethene	1.0	U	1.0	0.27	ug/L			02/16/18 18:19	1
1,2-Dichloropropane	1.0	U	1.0	0.30	ug/L			02/16/18 18:19	1
Diethyl ether	2.0	U	2.0	0.35	ug/L			02/16/18 18:19	1
Ethylbenzene	1.0	U	1.0	0.26	ug/L			02/16/18 18:19	1
2-Hexanone	10	U	10	1.2	ug/L			02/16/18 18:19	1
Isopropylbenzene	1.0	U	1.0	0.21	ug/L			02/16/18 18:19	1
Methyl acetate	10	U	10	1.4	ug/L			02/16/18 18:19	1
Methylcyclohexane	1.0	U	1.0	0.45	ug/L			02/16/18 18:19	1
Methylene Chloride	5.0	U	5.0	0.53	ug/L			02/16/18 18:19	1
4-Methyl-2-pentanone (MIBK)	10	U	10	0.71	ug/L			02/16/18 18:19	1
Methyl tert-butyl ether	1.0	U	1.0	0.27	ug/L			02/16/18 18:19	1
Styrene	1.0	U	1.0	0.23	ug/L			02/16/18 18:19	1
1,1,1,2-Tetrachloroethane	1.0	U	1.0	0.32	ug/L			02/16/18 18:19	1
Tetrachloroethene	1.0	U	1.0	0.30	ug/L			02/16/18 18:19	1
Toluene	1.0	U	1.0	0.23	ug/L			02/16/18 18:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.29	ug/L			02/16/18 18:19	1
trans-1,3-Dichloropropene	1.0	U	1.0	0.31	ug/L			02/16/18 18:19	1
1,2,4-Trichlorobenzene	1.0	U	1.0	0.27	ug/L			02/16/18 18:19	1
1,1,1-Trichloroethane	1.0	U	1.0	0.23	ug/L			02/16/18 18:19	1

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Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203728

TestAmerica Job ID: 240-91418-1

Client Sample ID: MW-57_020918

Lab Sample ID: 240-91418-1

Date Collected: 02/09/18 11:40

Matrix: Water

Date Received: 02/13/18 09:20

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2-Trichloroethane	1.0	U	1.0	0.34	ug/L			02/16/18 18:19	1
Trichloroethene	1.0	U	1.0	0.33	ug/L			02/16/18 18:19	1
Trichlorofluoromethane	1.0	U	1.0	0.50	ug/L			02/16/18 18:19	1
1,1,2-Trichloro-1,2,2-trifluoroethane	1.0	U	1.0	0.41	ug/L			02/16/18 18:19	1
1,2,3-Trimethylbenzene	5.0	U	5.0	0.22	ug/L			02/16/18 18:19	1
1,2,4-Trimethylbenzene	1.0	U	1.0	0.24	ug/L			02/16/18 18:19	1
1,3,5-Trimethylbenzene	1.0	U	1.0	0.24	ug/L			02/16/18 18:19	1
Vinyl chloride	0.59	J	1.0	0.45	ug/L			02/16/18 18:19	1
Xylenes, Total	2.0	U	2.0	0.24	ug/L			02/16/18 18:19	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	92		69 - 120					02/16/18 18:19	1
Dibromofluoromethane (Surr)	100		69 - 124					02/16/18 18:19	1
1,2-Dichloroethane-d4 (Surr)	101		61 - 138					02/16/18 18:19	1
Toluene-d8 (Surr)	99		73 - 120					02/16/18 18:19	1

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203728

TestAmerica Job ID: 240-91418-1

Client Sample ID: MW-64_020918

Lab Sample ID: 240-91418-2

Date Collected: 02/09/18 12:55

Matrix: Water

Date Received: 02/13/18 09:20

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	0.24	ug/L			02/19/18 17:08	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	98		63 - 125					02/19/18 17:08	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	10	1.8	ug/L			02/16/18 18:41	1
Benzene	1.0	U	1.0	0.28	ug/L			02/16/18 18:41	1
Bromodichloromethane	1.0	U	1.0	0.30	ug/L			02/16/18 18:41	1
Bromoform	1.0	U	1.0	0.43	ug/L			02/16/18 18:41	1
Bromomethane	1.0	U	1.0	0.42	ug/L			02/16/18 18:41	1
2-Butanone (MEK)	10	U	10	1.0	ug/L			02/16/18 18:41	1
Carbon disulfide	5.0	U	5.0	0.34	ug/L			02/16/18 18:41	1
Carbon tetrachloride	1.0	U	1.0	0.35	ug/L			02/16/18 18:41	1
Chlorobenzene	1.0	U	1.0	0.32	ug/L			02/16/18 18:41	1
Chloroethane	1.0	U	1.0	0.41	ug/L			02/16/18 18:41	1
Chloroform	1.0	U	1.0	0.31	ug/L			02/16/18 18:41	1
Chloromethane	1.0	U	1.0	0.43	ug/L			02/16/18 18:41	1
cis-1,2-Dichloroethene	0.30	J	1.0	0.30	ug/L			02/16/18 18:41	1
cis-1,3-Dichloropropene	1.0	U	1.0	0.26	ug/L			02/16/18 18:41	1
Cyclohexane	1.0	U	1.0	0.44	ug/L			02/16/18 18:41	1
Dibromochloromethane	1.0	U	1.0	0.25	ug/L			02/16/18 18:41	1
1,2-Dibromo-3-Chloropropane	1.0	U	1.0	0.47	ug/L			02/16/18 18:41	1
1,2-Dibromoethane	1.0	U	1.0	0.23	ug/L			02/16/18 18:41	1
1,2-Dichlorobenzene	1.0	U	1.0	0.26	ug/L			02/16/18 18:41	1
1,3-Dichlorobenzene	1.0	U	1.0	0.32	ug/L			02/16/18 18:41	1
1,4-Dichlorobenzene	1.0	U	1.0	0.23	ug/L			02/16/18 18:41	1
Dichlorodifluoromethane	1.0	U	1.0	0.50	ug/L			02/16/18 18:41	1
1,1-Dichloroethane	1.0	U	1.0	0.25	ug/L			02/16/18 18:41	1
1,2-Dichloroethane	1.0	U	1.0	0.30	ug/L			02/16/18 18:41	1
1,1-Dichloroethene	1.0	U	1.0	0.27	ug/L			02/16/18 18:41	1
1,2-Dichloropropane	1.0	U	1.0	0.30	ug/L			02/16/18 18:41	1
Diethyl ether	2.0	U	2.0	0.35	ug/L			02/16/18 18:41	1
Ethylbenzene	1.0	U	1.0	0.26	ug/L			02/16/18 18:41	1
2-Hexanone	10	U	10	1.2	ug/L			02/16/18 18:41	1
Isopropylbenzene	1.0	U	1.0	0.21	ug/L			02/16/18 18:41	1
Methyl acetate	10	U	10	1.4	ug/L			02/16/18 18:41	1
Methylcyclohexane	1.0	U	1.0	0.45	ug/L			02/16/18 18:41	1
Methylene Chloride	5.0	U	5.0	0.53	ug/L			02/16/18 18:41	1
4-Methyl-2-pentanone (MIBK)	10	U	10	0.71	ug/L			02/16/18 18:41	1
Methyl tert-butyl ether	1.0	U	1.0	0.27	ug/L			02/16/18 18:41	1
Styrene	1.0	U	1.0	0.23	ug/L			02/16/18 18:41	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0	0.32	ug/L			02/16/18 18:41	1
Tetrachloroethene	1.0	U	1.0	0.30	ug/L			02/16/18 18:41	1
Toluene	1.0	U	1.0	0.23	ug/L			02/16/18 18:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.29	ug/L			02/16/18 18:41	1
trans-1,3-Dichloropropene	1.0	U	1.0	0.31	ug/L			02/16/18 18:41	1
1,2,4-Trichlorobenzene	1.0	U	1.0	0.27	ug/L			02/16/18 18:41	1
1,1,1-Trichloroethane	1.0	U	1.0	0.23	ug/L			02/16/18 18:41	1

TestAmerica Canton

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203728

TestAmerica Job ID: 240-91418-1

Client Sample ID: MW-64_020918

Lab Sample ID: 240-91418-2

Date Collected: 02/09/18 12:55

Matrix: Water

Date Received: 02/13/18 09:20

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1,2-Trichloroethane	1.0	U	1.0	0.34	ug/L			02/16/18 18:41	1
Trichloroethene	1.0	U	1.0	0.33	ug/L			02/16/18 18:41	1
Trichlorofluoromethane	1.0	U	1.0	0.50	ug/L			02/16/18 18:41	1
1,1,2-Trichloro-1,2,2-trifluoroethane	1.0	U	1.0	0.41	ug/L			02/16/18 18:41	1
1,2,3-Trimethylbenzene	5.0	U	5.0	0.22	ug/L			02/16/18 18:41	1
1,2,4-Trimethylbenzene	1.0	U	1.0	0.24	ug/L			02/16/18 18:41	1
1,3,5-Trimethylbenzene	1.0	U	1.0	0.24	ug/L			02/16/18 18:41	1
Vinyl chloride	6.7		1.0	0.45	ug/L			02/16/18 18:41	1
Xylenes, Total	2.0	U	2.0	0.24	ug/L			02/16/18 18:41	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	92		69 - 120		02/16/18 18:41	1
Dibromofluoromethane (Surr)	98		69 - 124		02/16/18 18:41	1
1,2-Dichloroethane-d4 (Surr)	97		61 - 138		02/16/18 18:41	1
Toluene-d8 (Surr)	97		73 - 120		02/16/18 18:41	1

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203728

TestAmerica Job ID: 240-91418-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-91418-3

Date Collected: 02/09/18 00:00

Matrix: Water

Date Received: 02/13/18 09:20

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	3.0	J	10	1.8	ug/L			02/16/18 19:03	1
Benzene	1.0	U	1.0	0.28	ug/L			02/16/18 19:03	1
Bromodichloromethane	1.0	U	1.0	0.30	ug/L			02/16/18 19:03	1
Bromoform	1.0	U	1.0	0.43	ug/L			02/16/18 19:03	1
Bromomethane	1.0	U	1.0	0.42	ug/L			02/16/18 19:03	1
2-Butanone (MEK)	10	U	10	1.0	ug/L			02/16/18 19:03	1
Carbon disulfide	5.0	U	5.0	0.34	ug/L			02/16/18 19:03	1
Carbon tetrachloride	1.0	U	1.0	0.35	ug/L			02/16/18 19:03	1
Chlorobenzene	1.0	U	1.0	0.32	ug/L			02/16/18 19:03	1
Chloroethane	1.0	U	1.0	0.41	ug/L			02/16/18 19:03	1
Chloroform	1.0	U	1.0	0.31	ug/L			02/16/18 19:03	1
Chloromethane	1.0	U	1.0	0.43	ug/L			02/16/18 19:03	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.30	ug/L			02/16/18 19:03	1
cis-1,3-Dichloropropene	1.0	U	1.0	0.26	ug/L			02/16/18 19:03	1
Cyclohexane	1.0	U	1.0	0.44	ug/L			02/16/18 19:03	1
Dibromochloromethane	1.0	U	1.0	0.25	ug/L			02/16/18 19:03	1
1,2-Dibromo-3-Chloropropane	1.0	U	1.0	0.47	ug/L			02/16/18 19:03	1
1,2-Dibromoethane	1.0	U	1.0	0.23	ug/L			02/16/18 19:03	1
1,2-Dichlorobenzene	1.0	U	1.0	0.26	ug/L			02/16/18 19:03	1
1,3-Dichlorobenzene	1.0	U	1.0	0.32	ug/L			02/16/18 19:03	1
1,4-Dichlorobenzene	1.0	U	1.0	0.23	ug/L			02/16/18 19:03	1
Dichlorodifluoromethane	1.0	U	1.0	0.50	ug/L			02/16/18 19:03	1
1,1-Dichloroethane	1.0	U	1.0	0.25	ug/L			02/16/18 19:03	1
1,2-Dichloroethane	1.0	U	1.0	0.30	ug/L			02/16/18 19:03	1
1,1-Dichloroethene	1.0	U	1.0	0.27	ug/L			02/16/18 19:03	1
1,2-Dichloropropane	1.0	U	1.0	0.30	ug/L			02/16/18 19:03	1
Diethyl ether	2.0	U	2.0	0.35	ug/L			02/16/18 19:03	1
Ethylbenzene	1.0	U	1.0	0.26	ug/L			02/16/18 19:03	1
2-Hexanone	10	U	10	1.2	ug/L			02/16/18 19:03	1
Isopropylbenzene	1.0	U	1.0	0.21	ug/L			02/16/18 19:03	1
Methyl acetate	10	U	10	1.4	ug/L			02/16/18 19:03	1
Methylcyclohexane	1.0	U	1.0	0.45	ug/L			02/16/18 19:03	1
Methylene Chloride	5.0	U	5.0	0.53	ug/L			02/16/18 19:03	1
4-Methyl-2-pentanone (MIBK)	10	U	10	0.71	ug/L			02/16/18 19:03	1
Methyl tert-butyl ether	1.0	U	1.0	0.27	ug/L			02/16/18 19:03	1
Styrene	1.0	U	1.0	0.23	ug/L			02/16/18 19:03	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0	0.32	ug/L			02/16/18 19:03	1
Tetrachloroethene	1.0	U	1.0	0.30	ug/L			02/16/18 19:03	1
Toluene	1.0	U	1.0	0.23	ug/L			02/16/18 19:03	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.29	ug/L			02/16/18 19:03	1
trans-1,3-Dichloropropene	1.0	U	1.0	0.31	ug/L			02/16/18 19:03	1
1,2,4-Trichlorobenzene	1.0	U	1.0	0.27	ug/L			02/16/18 19:03	1
1,1,1-Trichloroethane	1.0	U	1.0	0.23	ug/L			02/16/18 19:03	1
1,1,2-Trichloroethane	1.0	U	1.0	0.34	ug/L			02/16/18 19:03	1
Trichloroethene	1.0	U	1.0	0.33	ug/L			02/16/18 19:03	1
Trichlorofluoromethane	1.0	U	1.0	0.50	ug/L			02/16/18 19:03	1
1,1,2-Trichloro-1,2,2-trifluoroethane	1.0	U	1.0	0.41	ug/L			02/16/18 19:03	1
1,2,3-Trimethylbenzene	5.0	U	5.0	0.22	ug/L			02/16/18 19:03	1
1,2,4-Trimethylbenzene	1.0	U	1.0	0.24	ug/L			02/16/18 19:03	1

TestAmerica Canton

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203728

TestAmerica Job ID: 240-91418-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-91418-3

Date Collected: 02/09/18 00:00

Matrix: Water

Date Received: 02/13/18 09:20

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,3,5-Trimethylbenzene	1.0	U	1.0	0.24	ug/L			02/16/18 19:03	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			02/16/18 19:03	1
Xylenes, Total	2.0	U	2.0	0.24	ug/L			02/16/18 19:03	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	87		69 - 120		02/16/18 19:03	1
Dibromofluoromethane (Surr)	95		69 - 124		02/16/18 19:03	1
1,2-Dichloroethane-d4 (Surr)	94		61 - 138		02/16/18 19:03	1
Toluene-d8 (Surr)	97		73 - 120		02/16/18 19:03	1

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203728

TestAmerica Job ID: 240-91418-1

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

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	BFB	DBFM	DCA	TOL
		(69-120)	(69-124)	(61-138)	(73-120)
240-91418-1	MW-57_020918	92	100	101	99
240-91418-2	MW-64_020918	92	98	97	97
240-91418-3	TRIP BLANK	87	95	94	97
240-91428-E-6 MS	Matrix Spike	90	91	98	99
240-91428-F-6 MSD	Matrix Spike Duplicate	91	94	97	99
LCS 240-315090/4	Lab Control Sample	91	95	93	98
MB 240-315090/6	Method Blank	90	102	97	97

Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)

DBFM = Dibromofluoromethane (Surr)

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

TOL = Toluene-d8 (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)
240-91418-1	MW-57_020918	109
240-91418-2	MW-64_020918	98
240-91428-C-6 MS	Matrix Spike	94
240-91428-C-6 MSD	Matrix Spike Duplicate	103
LCS 240-315270/4	Lab Control Sample	104
MB 240-315270/5	Method Blank	92

Surrogate Legend

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

QC Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203728

TestAmerica Job ID: 240-91418-1

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

Lab Sample ID: MB 240-315090/6

Matrix: Water

Analysis Batch: 315090

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Acetone	10	U	10	1.8	ug/L			02/16/18 14:27	1
Benzene	1.0	U	1.0	0.28	ug/L			02/16/18 14:27	1
Bromodichloromethane	1.0	U	1.0	0.30	ug/L			02/16/18 14:27	1
Bromoform	1.0	U	1.0	0.43	ug/L			02/16/18 14:27	1
Bromomethane	1.0	U	1.0	0.42	ug/L			02/16/18 14:27	1
2-Butanone (MEK)	10	U	10	1.0	ug/L			02/16/18 14:27	1
Carbon disulfide	5.0	U	5.0	0.34	ug/L			02/16/18 14:27	1
Carbon tetrachloride	1.0	U	1.0	0.35	ug/L			02/16/18 14:27	1
Chlorobenzene	1.0	U	1.0	0.32	ug/L			02/16/18 14:27	1
Chloroethane	1.0	U	1.0	0.41	ug/L			02/16/18 14:27	1
Chloroform	1.0	U	1.0	0.31	ug/L			02/16/18 14:27	1
Chloromethane	1.0	U	1.0	0.43	ug/L			02/16/18 14:27	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.30	ug/L			02/16/18 14:27	1
cis-1,3-Dichloropropene	1.0	U	1.0	0.26	ug/L			02/16/18 14:27	1
Cyclohexane	1.0	U	1.0	0.44	ug/L			02/16/18 14:27	1
Dibromochloromethane	1.0	U	1.0	0.25	ug/L			02/16/18 14:27	1
1,2-Dibromo-3-Chloropropane	1.0	U	1.0	0.47	ug/L			02/16/18 14:27	1
1,2-Dibromoethane	1.0	U	1.0	0.23	ug/L			02/16/18 14:27	1
1,2-Dichlorobenzene	1.0	U	1.0	0.26	ug/L			02/16/18 14:27	1
1,3-Dichlorobenzene	1.0	U	1.0	0.32	ug/L			02/16/18 14:27	1
1,4-Dichlorobenzene	1.0	U	1.0	0.23	ug/L			02/16/18 14:27	1
Dichlorodifluoromethane	1.0	U	1.0	0.50	ug/L			02/16/18 14:27	1
1,1-Dichloroethane	1.0	U	1.0	0.25	ug/L			02/16/18 14:27	1
1,2-Dichloroethane	1.0	U	1.0	0.30	ug/L			02/16/18 14:27	1
1,1-Dichloroethene	1.0	U	1.0	0.27	ug/L			02/16/18 14:27	1
1,2-Dichloropropane	1.0	U	1.0	0.30	ug/L			02/16/18 14:27	1
Diethyl ether	2.0	U	2.0	0.35	ug/L			02/16/18 14:27	1
Ethylbenzene	1.0	U	1.0	0.26	ug/L			02/16/18 14:27	1
2-Hexanone	10	U	10	1.2	ug/L			02/16/18 14:27	1
Isopropylbenzene	1.0	U	1.0	0.21	ug/L			02/16/18 14:27	1
Methyl acetate	10	U	10	1.4	ug/L			02/16/18 14:27	1
Methylcyclohexane	1.0	U	1.0	0.45	ug/L			02/16/18 14:27	1
Methylene Chloride	5.0	U	5.0	0.53	ug/L			02/16/18 14:27	1
4-Methyl-2-pentanone (MIBK)	10	U	10	0.71	ug/L			02/16/18 14:27	1
Methyl tert-butyl ether	1.0	U	1.0	0.27	ug/L			02/16/18 14:27	1
Styrene	1.0	U	1.0	0.23	ug/L			02/16/18 14:27	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0	0.32	ug/L			02/16/18 14:27	1
Tetrachloroethene	1.0	U	1.0	0.30	ug/L			02/16/18 14:27	1
Toluene	1.0	U	1.0	0.23	ug/L			02/16/18 14:27	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.29	ug/L			02/16/18 14:27	1
trans-1,3-Dichloropropene	1.0	U	1.0	0.31	ug/L			02/16/18 14:27	1
1,2,4-Trichlorobenzene	1.0	U	1.0	0.27	ug/L			02/16/18 14:27	1
1,1,1-Trichloroethane	1.0	U	1.0	0.23	ug/L			02/16/18 14:27	1
1,1,2-Trichloroethane	1.0	U	1.0	0.34	ug/L			02/16/18 14:27	1
Trichloroethene	1.0	U	1.0	0.33	ug/L			02/16/18 14:27	1
Trichlorofluoromethane	1.0	U	1.0	0.50	ug/L			02/16/18 14:27	1
1,1,2-Trichloro-1,2,2-trifluoroethane	1.0	U	1.0	0.41	ug/L			02/16/18 14:27	1
1,2,3-Trimethylbenzene	5.0	U	5.0	0.22	ug/L			02/16/18 14:27	1

TestAmerica Canton

QC Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203728

TestAmerica Job ID: 240-91418-1

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

Lab Sample ID: MB 240-315090/6
Matrix: Water
Analysis Batch: 315090

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,2,4-Trimethylbenzene	1.0	U	1.0	0.24	ug/L			02/16/18 14:27	1
1,3,5-Trimethylbenzene	1.0	U	1.0	0.24	ug/L			02/16/18 14:27	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			02/16/18 14:27	1
Xylenes, Total	2.0	U	2.0	0.24	ug/L			02/16/18 14:27	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	90		69 - 120		02/16/18 14:27	1
Dibromofluoromethane (Surr)	102		69 - 124		02/16/18 14:27	1
1,2-Dichloroethane-d4 (Surr)	97		61 - 138		02/16/18 14:27	1
Toluene-d8 (Surr)	97		73 - 120		02/16/18 14:27	1

Lab Sample ID: LCS 240-315090/4
Matrix: Water
Analysis Batch: 315090

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Acetone	20.0	25.2		ug/L		126	35 - 131
Benzene	10.0	9.39		ug/L		94	79 - 120
Bromodichloromethane	10.0	10.3		ug/L		103	79 - 125
Bromoform	10.0	9.86		ug/L		99	55 - 145
Bromomethane	10.0	8.12		ug/L		81	17 - 158
2-Butanone (MEK)	20.0	23.8		ug/L		119	43 - 149
Carbon disulfide	10.0	9.62		ug/L		96	49 - 141
Carbon tetrachloride	10.0	10.8		ug/L		108	55 - 171
Chlorobenzene	10.0	10.8		ug/L		108	80 - 120
Chloroethane	10.0	5.46		ug/L		55	10 - 149
Chloroform	10.0	10.1		ug/L		101	80 - 120
Chloromethane	10.0	7.66		ug/L		77	59 - 124
cis-1,2-Dichloroethene	10.0	9.56		ug/L		96	77 - 120
cis-1,3-Dichloropropene	10.0	10.4		ug/L		104	75 - 120
Cyclohexane	10.0	8.50		ug/L		85	66 - 135
Dibromochloromethane	10.0	10.8		ug/L		108	64 - 129
1,2-Dibromo-3-Chloropropane	10.0	7.82		ug/L		78	50 - 130
1,2-Dibromoethane	10.0	10.8		ug/L		108	80 - 120
1,2-Dichlorobenzene	10.0	9.44		ug/L		94	80 - 120
1,3-Dichlorobenzene	10.0	9.39		ug/L		94	80 - 120
1,4-Dichlorobenzene	10.0	9.62		ug/L		96	80 - 120
Dichlorodifluoromethane	10.0	8.49		ug/L		85	42 - 141
1,1-Dichloroethane	10.0	9.57		ug/L		96	74 - 120
1,2-Dichloroethane	10.0	11.3		ug/L		113	68 - 133
1,1-Dichloroethene	10.0	10.4		ug/L		104	65 - 127
1,2-Dichloropropane	10.0	9.78		ug/L		98	78 - 127
Diethyl ether	10.0	10.5		ug/L		105	72 - 125
Ethylbenzene	10.0	10.4		ug/L		104	80 - 120
2-Hexanone	20.0	22.3		ug/L		111	28 - 169
Isopropylbenzene	10.0	9.98		ug/L		100	80 - 128
Methyl acetate	20.0	16.6		ug/L		83	63 - 137
Methylcyclohexane	10.0	8.77		ug/L		88	63 - 141

TestAmerica Canton

QC Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203728

TestAmerica Job ID: 240-91418-1

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

Lab Sample ID: LCS 240-315090/4
Matrix: Water
Analysis Batch: 315090

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Methylene Chloride	10.0	9.53		ug/L		95	64 - 140
4-Methyl-2-pentanone (MIBK)	20.0	20.3		ug/L		101	53 - 144
Methyl tert-butyl ether	10.0	9.53		ug/L		95	73 - 120
Styrene	10.0	10.2		ug/L		102	80 - 121
1,1,2,2-Tetrachloroethane	10.0	9.44		ug/L		94	58 - 122
Tetrachloroethene	10.0	10.3		ug/L		103	80 - 122
Toluene	10.0	10.2		ug/L		102	78 - 120
trans-1,2-Dichloroethene	10.0	9.99		ug/L		100	74 - 124
trans-1,3-Dichloropropene	10.0	9.65		ug/L		97	67 - 120
1,2,4-Trichlorobenzene	10.0	7.72		ug/L		77	34 - 141
1,1,1-Trichloroethane	10.0	10.4		ug/L		104	64 - 147
1,1,2-Trichloroethane	10.0	10.5		ug/L		105	76 - 121
Trichloroethene	10.0	10.2		ug/L		102	76 - 124
Trichlorofluoromethane	10.0	9.94		ug/L		99	27 - 176
1,1,2-Trichloro-1,2,2-trifluoroethane	10.0	11.5		ug/L		115	65 - 144
1,2,4-Trimethylbenzene	10.0	9.38		ug/L		94	80 - 120
1,3,5-Trimethylbenzene	10.0	9.34		ug/L		93	79 - 120
Vinyl chloride	10.0	8.36		ug/L		84	65 - 124
Xylenes, Total	20.0	20.4		ug/L		102	80 - 120
1,4-Dioxane	200	283	*	ug/L		141	35 - 134

Surrogate	LCS %Recovery	LCS Qualifier	LCS Limits
4-Bromofluorobenzene (Surr)	91		69 - 120
Dibromofluoromethane (Surr)	95		69 - 124
1,2-Dichloroethane-d4 (Surr)	93		61 - 138
Toluene-d8 (Surr)	98		73 - 120

Lab Sample ID: 240-91428-E-6 MS
Matrix: Water
Analysis Batch: 315090

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
Acetone	10	U	20.0	11.6		ug/L		58	19 - 133
Benzene	1.0	U	10.0	8.64		ug/L		86	69 - 127
Bromodichloromethane	1.0	U	10.0	8.81		ug/L		88	75 - 128
Bromoform	1.0	U	10.0	7.85		ug/L		78	61 - 135
Bromomethane	1.0	U	10.0	5.88		ug/L		59	10 - 148
2-Butanone (MEK)	10	U	20.0	17.6		ug/L		88	34 - 153
Carbon disulfide	5.0	U	10.0	8.66		ug/L		87	46 - 143
Carbon tetrachloride	1.0	U	10.0	10.3		ug/L		103	53 - 175
Chlorobenzene	1.0	U	10.0	9.67		ug/L		97	76 - 120
Chloroethane	1.0	U	10.0	4.00		ug/L		40	10 - 141
Chloroform	1.0	U	10.0	9.39		ug/L		94	74 - 125
Chloromethane	1.0	U	10.0	7.41		ug/L		74	34 - 127
cis-1,2-Dichloroethene	1.0	U	10.0	8.54		ug/L		85	69 - 127
cis-1,3-Dichloropropene	1.0	U	10.0	8.48		ug/L		85	68 - 120
Cyclohexane	1.0	U	10.0	8.21		ug/L		82	56 - 135

TestAmerica Canton

QC Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203728

TestAmerica Job ID: 240-91418-1

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

Lab Sample ID: 240-91428-E-6 MS

Matrix: Water

Analysis Batch: 315090

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
Dibromochloromethane	1.0	U	10.0	9.09		ug/L		91	62 - 131
1,2-Dibromo-3-Chloropropane	1.0	U	10.0	7.22		ug/L		72	48 - 130
1,2-Dibromoethane	1.0	U	10.0	9.81		ug/L		98	73 - 121
1,2-Dichlorobenzene	1.0	U	10.0	8.34		ug/L		83	70 - 120
1,3-Dichlorobenzene	1.0	U	10.0	8.34		ug/L		83	71 - 120
1,4-Dichlorobenzene	1.0	U	10.0	8.49		ug/L		85	72 - 120
Dichlorodifluoromethane	1.0	U	10.0	9.11		ug/L		91	45 - 130
1,1-Dichloroethane	1.0	U	10.0	8.89		ug/L		89	69 - 122
1,2-Dichloroethane	1.0	U	10.0	10.1		ug/L		101	64 - 138
1,1-Dichloroethene	1.0	U	10.0	9.98		ug/L		100	62 - 127
1,2-Dichloropropane	1.0	U	10.0	9.08		ug/L		91	72 - 131
Diethyl ether	2.0	U	10.0	9.14		ug/L		91	65 - 124
Ethylbenzene	1.0	U	10.0	9.21		ug/L		92	72 - 121
2-Hexanone	10	U	20.0	18.9		ug/L		95	21 - 184
Isopropylbenzene	1.0	U	10.0	8.82		ug/L		88	70 - 132
Methyl acetate	10	U	20.0	13.2		ug/L		66	52 - 139
Methylcyclohexane	1.0	U	10.0	8.48		ug/L		85	46 - 139
Methylene Chloride	5.0	U	10.0	8.01		ug/L		80	52 - 137
4-Methyl-2-pentanone (MIBK)	10	U	20.0	17.2		ug/L		86	53 - 147
Methyl tert-butyl ether	1.0	U	10.0	8.41		ug/L		84	67 - 125
Styrene	1.0	U	10.0	8.65		ug/L		86	74 - 125
1,1,2,2-Tetrachloroethane	1.0	U	10.0	8.97		ug/L		90	51 - 123
Tetrachloroethene	1.0	U	10.0	9.46		ug/L		95	69 - 126
Toluene	1.0	U	10.0	9.33		ug/L		93	69 - 125
trans-1,2-Dichloroethene	1.0	U	10.0	9.52		ug/L		95	66 - 131
trans-1,3-Dichloropropene	1.0	U	10.0	8.48		ug/L		85	59 - 120
1,2,4-Trichlorobenzene	1.0	U	10.0	7.06		ug/L		71	26 - 138
1,1,1-Trichloroethane	1.0	U	10.0	9.98		ug/L		100	57 - 156
1,1,2-Trichloroethane	1.0	U	10.0	9.46		ug/L		95	68 - 127
Trichloroethene	1.0	U	10.0	9.43		ug/L		94	68 - 129
Trichlorofluoromethane	1.0	U	10.0	9.05		ug/L		91	28 - 172
1,1,2-Trichloro-1,2,2-trifluoroethane	1.0	U	10.0	11.4		ug/L		114	58 - 137
1,2,4-Trimethylbenzene	1.0	U	10.0	8.40		ug/L		84	64 - 120
1,3,5-Trimethylbenzene	1.0	U	10.0	8.49		ug/L		85	67 - 120
Vinyl chloride	5.5		10.0	12.7		ug/L		72	55 - 123
Xylenes, Total	2.0	U	20.0	17.9		ug/L		89	71 - 122
1,4-Dioxane	50	U *	200	117		ug/L		58	13 - 155

Surrogate	MS %Recovery	MS Qualifier	Limits
4-Bromofluorobenzene (Surr)	90		69 - 120
Dibromofluoromethane (Surr)	91		69 - 124
1,2-Dichloroethane-d4 (Surr)	98		61 - 138
Toluene-d8 (Surr)	99		73 - 120

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203728

TestAmerica Job ID: 240-91418-1

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

Lab Sample ID: 240-91428-F-6 MSD

Matrix: Water

Analysis Batch: 315090

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
Acetone	10	U	20.0	12.8		ug/L		64	19 - 133	10	35
Benzene	1.0	U	10.0	8.35		ug/L		83	69 - 127	3	10
Bromodichloromethane	1.0	U	10.0	9.00		ug/L		90	75 - 128	2	13
Bromoform	1.0	U	10.0	8.21		ug/L		82	61 - 135	5	13
Bromomethane	1.0	U	10.0	6.71		ug/L		67	10 - 148	13	35
2-Butanone (MEK)	10	U	20.0	16.9		ug/L		85	34 - 153	4	23
Carbon disulfide	5.0	U	10.0	8.92		ug/L		89	46 - 143	3	18
Carbon tetrachloride	1.0	U	10.0	9.72		ug/L		97	53 - 175	6	17
Chlorobenzene	1.0	U	10.0	9.60		ug/L		96	76 - 120	1	12
Chloroethane	1.0	U	10.0	4.16		ug/L		42	10 - 141	4	35
Chloroform	1.0	U	10.0	9.33		ug/L		93	74 - 125	1	11
Chloromethane	1.0	U	10.0	6.93		ug/L		69	34 - 127	7	25
cis-1,2-Dichloroethene	1.0	U	10.0	8.85		ug/L		88	69 - 127	4	11
cis-1,3-Dichloropropene	1.0	U	10.0	8.01		ug/L		80	68 - 120	6	13
Cyclohexane	1.0	U	10.0	7.23		ug/L		72	56 - 135	13	35
Dibromochloromethane	1.0	U	10.0	9.38		ug/L		94	62 - 131	3	15
1,2-Dibromo-3-Chloropropane	1.0	U	10.0	7.84		ug/L		78	48 - 130	8	31
1,2-Dibromoethane	1.0	U	10.0	9.67		ug/L		97	73 - 121	1	12
1,2-Dichlorobenzene	1.0	U	10.0	8.87		ug/L		89	70 - 120	6	19
1,3-Dichlorobenzene	1.0	U	10.0	8.69		ug/L		87	71 - 120	4	18
1,4-Dichlorobenzene	1.0	U	10.0	8.61		ug/L		86	72 - 120	1	17
Dichlorodifluoromethane	1.0	U	10.0	8.03		ug/L		80	45 - 130	13	34
1,1-Dichloroethane	1.0	U	10.0	8.99		ug/L		90	69 - 122	1	11
1,2-Dichloroethane	1.0	U	10.0	10.4		ug/L		104	64 - 138	3	11
1,1-Dichloroethene	1.0	U	10.0	9.38		ug/L		94	62 - 127	6	14
1,2-Dichloropropane	1.0	U	10.0	8.38		ug/L		84	72 - 131	8	12
Diethyl ether	2.0	U	10.0	9.78		ug/L		98	65 - 124	7	11
Ethylbenzene	1.0	U	10.0	9.36		ug/L		94	72 - 121	2	15
2-Hexanone	10	U	20.0	19.3		ug/L		97	21 - 184	2	12
Isopropylbenzene	1.0	U	10.0	8.98		ug/L		90	70 - 132	2	16
Methyl acetate	10	U	20.0	14.1		ug/L		71	52 - 139	7	14
Methylcyclohexane	1.0	U	10.0	7.10		ug/L		71	46 - 139	18	35
Methylene Chloride	5.0	U	10.0	8.29		ug/L		83	52 - 137	3	12
4-Methyl-2-pentanone (MIBK)	10	U	20.0	17.6		ug/L		88	53 - 147	3	16
Methyl tert-butyl ether	1.0	U	10.0	8.76		ug/L		88	67 - 125	4	12
Styrene	1.0	U	10.0	8.89		ug/L		89	74 - 125	3	14
1,1,2,2-Tetrachloroethane	1.0	U	10.0	9.17		ug/L		92	51 - 123	2	17
Tetrachloroethene	1.0	U	10.0	8.93		ug/L		89	69 - 126	6	18
Toluene	1.0	U	10.0	9.35		ug/L		93	69 - 125	0	14
trans-1,2-Dichloroethene	1.0	U	10.0	9.22		ug/L		92	66 - 131	3	11
trans-1,3-Dichloropropene	1.0	U	10.0	7.77		ug/L		78	59 - 120	9	14
1,2,4-Trichlorobenzene	1.0	U	10.0	7.88		ug/L		79	26 - 138	11	35
1,1,1-Trichloroethane	1.0	U	10.0	9.66		ug/L		97	57 - 156	3	13
1,1,2-Trichloroethane	1.0	U	10.0	9.33		ug/L		93	68 - 127	1	11
Trichloroethene	1.0	U	10.0	8.44		ug/L		84	68 - 129	11	12
Trichlorofluoromethane	1.0	U	10.0	10.4		ug/L		104	28 - 172	14	26
1,1,2-Trichloro-1,2,2-trifluoroethane	1.0	U	10.0	10.3		ug/L		103	58 - 137	10	35

TestAmerica Canton

QC Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203728

TestAmerica Job ID: 240-91418-1

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

Lab Sample ID: 240-91428-F-6 MSD
Matrix: Water
Analysis Batch: 315090

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
1,2,4-Trimethylbenzene	1.0	U	10.0	8.58		ug/L		86	64 - 120	2	22
1,3,5-Trimethylbenzene	1.0	U	10.0	8.49		ug/L		85	67 - 120	0	25
Vinyl chloride	5.5		10.0	13.0		ug/L		75	55 - 123	2	12
Xylenes, Total	2.0	U	20.0	18.2		ug/L		91	71 - 122	2	14
1,4-Dioxane	50	U *	200	124		ug/L		62	13 - 155	6	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	91		69 - 120
Dibromofluoromethane (Surr)	94		69 - 124
1,2-Dichloroethane-d4 (Surr)	97		61 - 138
Toluene-d8 (Surr)	99		73 - 120

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

Lab Sample ID: MB 240-315270/5
Matrix: Water
Analysis Batch: 315270

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	0.24	ug/L			02/19/18 11:14	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	92		63 - 125		02/19/18 11:14	1

Lab Sample ID: LCS 240-315270/4
Matrix: Water
Analysis Batch: 315270

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	8.86		ug/L		89	59 - 131

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	104		63 - 125

Lab Sample ID: 240-91428-C-6 MS
Matrix: Water
Analysis Batch: 315270

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	0.41	J	10.0	10.5		ug/L		101	52 - 129

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	94		63 - 125

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QC Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203728

TestAmerica Job ID: 240-91418-1

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

Lab Sample ID: 240-91428-C-6 MSD
 Matrix: Water
 Analysis Batch: 315270

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	0.41	J	10.0	9.34		ug/L		89	52 - 129	12	13
Surrogate	%Recovery	MSD Qualifier	Limits								
1,2-Dichloroethane-d4 (Surr)	103		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 - E203728

TestAmerica Job ID: 240-91418-1

GC/MS VOA

Analysis Batch: 315090

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-91418-1	MW-57_020918	Total/NA	Water	8260B	
240-91418-2	MW-64_020918	Total/NA	Water	8260B	
240-91418-3	TRIP BLANK	Total/NA	Water	8260B	
MB 240-315090/6	Method Blank	Total/NA	Water	8260B	
LCS 240-315090/4	Lab Control Sample	Total/NA	Water	8260B	
240-91428-E-6 MS	Matrix Spike	Total/NA	Water	8260B	
240-91428-F-6 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	

Analysis Batch: 315270

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-91418-1	MW-57_020918	Total/NA	Water	8260B SIM	
240-91418-2	MW-64_020918	Total/NA	Water	8260B SIM	
MB 240-315270/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-315270/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-91428-C-6 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-91428-C-6 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203728

TestAmerica Job ID: 240-91418-1

Client Sample ID: MW-57_020918

Date Collected: 02/09/18 11:40

Date Received: 02/13/18 09:20

Lab Sample ID: 240-91418-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	315090	02/16/18 18:19	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	315270	02/19/18 16:43	SAM	TAL CAN

Client Sample ID: MW-64_020918

Date Collected: 02/09/18 12:55

Date Received: 02/13/18 09:20

Lab Sample ID: 240-91418-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	315090	02/16/18 18:41	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	315270	02/19/18 17:08	SAM	TAL CAN

Client Sample ID: TRIP BLANK

Date Collected: 02/09/18 00:00

Date Received: 02/13/18 09:20

Lab Sample ID: 240-91418-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	315090	02/16/18 19:03	LRW	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.

TestAmerica Job ID: 240-91418-1

Project/Site: Ford LTP Livonia MI - E203728

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	02-23-18 *
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-18
Illinois	NELAP	5	200004	07-31-18
Kansas	NELAP	7	E-10336	01-31-18 *
Kentucky (UST)	State Program	4	58	02-23-18 *
Kentucky (WW)	State Program	4	98016	12-31-18
Minnesota	NELAP	5	039-999-348	12-31-18
Minnesota (Petrofund)	State Program	1	3506	07-31-18
Nevada	State Program	9	OH-000482008A	07-31-18
New Jersey	NELAP	2	OH001	06-30-18
New York	NELAP	2	10975	03-31-18 *
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-18 *
Pennsylvania	NELAP	3	68-00340	08-31-18
Texas	NELAP	6	T104704517-17-9	08-31-18
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-18
Washington	State Program	10	C971	01-12-19
West Virginia DEP	State Program	3	210	12-31-18

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

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Chain of Custody Record

MICHIGAN 190

TestAmerica Laboratories, Inc.
THE LEADER IN ENVIRONMENTAL TESTING

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

Client Contact Company Name: Arcadis Address: 28550 Cabot Drive, Suite 500 City/State/Zip: Novi, MI, 48377 Phone: 248-994-2240 Project Name: Ford LTP Project Number: M1001386.0001.20000 PO # M1001386.0001.20000		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: krstoff@hinskey@arcadis.com		Site Contact: Angela DeGrandis Telephone: 734-320-0065	
Lab Contact: Denise Pohl Telephone: 330-966-9789		Lab Contact: Denise Pohl Telephone: 330-966-9789	
Method of Shipment/Carrier: Shipping/Tracking No:		Analysis Turnaround Time TAT if different from below <input type="checkbox"/> 3 weeks <input checked="" type="checkbox"/> 2 weeks <input type="checkbox"/> 1 week <input type="checkbox"/> 2 days <input type="checkbox"/> 1 day	
Sample Identification		Containers & Preservatives	
Sample Date Sample Time	Matrix <input type="checkbox"/> Aqueous <input type="checkbox"/> Sediment <input type="checkbox"/> Solid Other:	H2SO4 HNO3 HCl NaOH ZnOH Upretres Other:	Filtered Sample (Y/N) Composite=C/Grab=G VOCs 8260B 1,4-Dioxane 8260B SIM
MW-57-020918 MW-64-020918 TRIP BLANK	X X X	X X -	NG NG -
Sample Specific Notes / Special Instructions: Quantity: 6 Arcadis Quantity: 6 Quantity: 1		Sample Disposal (X fee may be assessed if samples are retained longer than 1 month) <input type="checkbox"/> Return to Client <input checked="" type="checkbox"/> Disposal By Lab <input type="checkbox"/> Archive For _____ Months	
Submit all results through Cadena at jim.tomalia@cadena.com. Cadena #E203728			
Relinquished by: DIVYA KAMATH Gundlurath		Received by: Novi Pridge	
Relinquished by: <i>[Signature]</i>		Received by: <i>[Signature]</i>	
Relinquished by: <i>[Signature]</i>		Received in Laboratory by: <i>[Signature]</i>	
Date/Time: 9/9/18 11:50 Date/Time: 2/12/18 1035 Date/Time: 2/12/18 1235	Company: Arcadis Company: Arcadis Company: Arcadis	Company: Arcadis Company: TA Company: TA	Date/Time: 2/9/18 11:50 Date/Time: 2/12/18 10:35 Date/Time: 2/13/18 920



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TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 91418

Client Arcadis Site Name _____
 Cooler Received on 2-13-18 Opened on 2-13-18

Cooler unpacked by: _____

FedEx: 1st ~~Grd~~ Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # _____ 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 -0.3°C) Observed Cooler Temp. 3.2 °C Corrected Cooler Temp. 2.9 °C
 IR GUN #36 (CF +0.3°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
 IR GUN # 627 (CF -1.3°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
 -Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
 -Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No
 -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
 4. Did custody papers accompany the sample(s)? Yes No
 5. Were the custody papers relinquished & signed in the appropriate place? Yes No
 6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
 7. Did all bottles arrive in good condition (Unbroken)? Yes No
 8. Could all bottle labels be reconciled with the COC? Yes No
 9. Were correct bottle(s) used for the test(s) indicated? Yes No
 10. Sufficient quantity received to perform indicated analyses? Yes No
 11. Are these work share samples? Yes No
 If yes, Questions 12-16 have been checked at the originating laboratory.
 12. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC730269
 13. Were VOAs on the COC? Yes No
 14. Were air bubbles >6 mm in any VOA vials? Larger than this. Yes No NA
 15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ 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 _____

16. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by: _____

17. 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)

18. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
 Time preserved: _____ Preservative(s) added/Lot number(s): _____