TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Canton
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Tel: (330)497-9396

TestAmerica Job ID: 240-91639-1
Client Project/Site: Ford LTP Livonia MI - E203728

For:
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Attn: Kristoffer Hinskey

Denise Pohl

Authorized for release by:
2/28/2018 1:00:12 PM

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Qualifiers

GC/MS VOA

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

Glossary

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

Job ID: 240-91639-1

Laboratory: TestAmerica Canton

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: Ford LTP Livonia MI - E203728

Report Number: 240-91639-1

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 2/17/2018 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.1º C.

VOLATILE ORGANIC COMPOUNDS (GCMS)

Samples MW-19_021418 (240-91639-1), MW-29_021418 (240-91639-2) and MW-33_021418 (240-91639-3) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 02/21/2018.

1,1,2,2-Tetrachloroethane and Toluene failed the recovery criteria high for LCS 240-315600/4. Refer to the QC report for details.

1,1,2,2-Tetrachloroethane failed the recovery criteria high for the MSD of sample 240-91640-7 in batch 240-315600. 2-Hexanone exceeded the RPD limit.

Method(s) 8260B: The continuing calibration verification (CCV) associated with batch 315600 recovered above the upper control limit for Toluene and 1,2-Dichloropropane. The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The following samples are impacted: MW-19_021418 (240-91639-1), MW-29_021418 (240-91639-2) and MW-33_021418 (240-91639-3).

Job ID: 240-91639-1 (Continued)

Laboratory: TestAmerica Canton (Continued)

Method(s) 8260B: The laboratory control sample (LCS) for 315600 recovered outside control limits for multiple analytes. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported: MW-19_021418 (240-91639-1), MW-29_021418 (240-91639-2), MW-33_021418 (240-91639-3) and (LCS 240-315600/4).

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-19_021418 (240-91639-1), MW-29_021418 (240-91639-2) and MW-33_021418 (240-91639-3) were analyzed for volatile organic compounds (GCMS SIM) in accordance with EPA SW-846 Method 8260B SIM. The samples were analyzed on 02/23/2018 and 02/26/2018.

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

Method Summary

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

TestAmerica Job ID: 240-91639-1

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: 240-91639-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-91639-1	MW-19_021418	Water	02/14/18 10:10	02/17/18 09:30
240-91639-2	MW-29_021418	Water	02/14/18 11:30	02/17/18 09:30
240-91639-3	MW-33_021418	Water	02/14/18 15:55	02/17/18 09:30

Detection Summary

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

TestAmerica Job ID: 240-91639-1

Client Sample ID: MW-19_021418 — Lab Sample ID: 240-91639-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	130		2.0	0.24	ug/L	1		8260B SIM	Total/NA
Chloroethane	6.5		1.0	0.41	ug/L	1		8260B	Total/NA
cis-1,2-Dichloroethene	0.94	J	1.0	0.30	ug/L	1		8260B	Total/NA
1,1-Dichloroethane	4.8		1.0	0.25	ug/L	1		8260B	Total/NA
1,2-Dichloroethane	0.52	J	1.0	0.30	ug/L	1		8260B	Total/NA
Trichloroethene	1.0		1.0	0.33	ug/L	1		8260B	Total/NA
Vinyl chloride	1.5		1.0	0.45	ug/L	1		8260B	Total/NA

Client Sample ID: MW-29_021418 — Lab Sample ID: 240-91639-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.90	J	2.0	0.24	ug/L	1		8260B SIM	Total/NA

Client Sample ID: MW-33_021418 — Lab Sample ID: 240-91639-3

No Detections.

This Detection Summary does not include radiochemical test results.

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

TestAmerica Job ID: 240-91639-1

Client Sample ID: MW-19_021418
Date Collected: 02/14/18 10:10
Date Received: 02/17/18 09:30

Lab Sample ID: 240-91639-1
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**130**		2.0	0.24	ug/L			02/23/18 21:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*63 - 125*		*02/23/18 21:58*	*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			02/21/18 14:44	1
Benzene	1.0	U	1.0	0.28	ug/L			02/21/18 14:44	1
Bromodichloromethane	1.0	U	1.0	0.30	ug/L			02/21/18 14:44	1
Bromoform	1.0	U	1.0	0.43	ug/L			02/21/18 14:44	1
Bromomethane	1.0	U	1.0	0.42	ug/L			02/21/18 14:44	1
2-Butanone (MEK)	10	U	10	1.0	ug/L			02/21/18 14:44	1
Carbon disulfide	5.0	U	5.0	0.34	ug/L			02/21/18 14:44	1
Carbon tetrachloride	1.0	U	1.0	0.35	ug/L			02/21/18 14:44	1
Chlorobenzene	1.0	U	1.0	0.32	ug/L			02/21/18 14:44	1
Chloroethane	**6.5**		1.0	0.41	ug/L			02/21/18 14:44	1
Chloroform	1.0	U	1.0	0.31	ug/L			02/21/18 14:44	1
Chloromethane	1.0	U	1.0	0.43	ug/L			02/21/18 14:44	1
cis-1,2-Dichloroethene	**0.94**	**J**	1.0	0.30	ug/L			02/21/18 14:44	1
cis-1,3-Dichloropropene	1.0	U	1.0	0.26	ug/L			02/21/18 14:44	1
Cyclohexane	1.0	U	1.0	0.44	ug/L			02/21/18 14:44	1
Dibromochloromethane	1.0	U	1.0	0.25	ug/L			02/21/18 14:44	1
1,2-Dibromo-3-Chloropropane	1.0	U	1.0	0.47	ug/L			02/21/18 14:44	1
1,2-Dibromoethane	1.0	U	1.0	0.23	ug/L			02/21/18 14:44	1
1,2-Dichlorobenzene	1.0	U	1.0	0.26	ug/L			02/21/18 14:44	1
1,3-Dichlorobenzene	1.0	U	1.0	0.32	ug/L			02/21/18 14:44	1
1,4-Dichlorobenzene	1.0	U	1.0	0.23	ug/L			02/21/18 14:44	1
Dichlorodifluoromethane	1.0	U	1.0	0.50	ug/L			02/21/18 14:44	1
1,1-Dichloroethane	**4.8**		1.0	0.25	ug/L			02/21/18 14:44	1
1,2-Dichloroethane	**0.52**	**J**	1.0	0.30	ug/L			02/21/18 14:44	1
1,1-Dichloroethene	1.0	U	1.0	0.27	ug/L			02/21/18 14:44	1
1,2-Dichloropropane	1.0	U	1.0	0.30	ug/L			02/21/18 14:44	1
Diethyl ether	2.0	U	2.0	0.35	ug/L			02/21/18 14:44	1
Ethylbenzene	1.0	U	1.0	0.26	ug/L			02/21/18 14:44	1
2-Hexanone	10	U	10	1.2	ug/L			02/21/18 14:44	1
Isopropylbenzene	1.0	U	1.0	0.21	ug/L			02/21/18 14:44	1
Methyl acetate	10	U	10	1.4	ug/L			02/21/18 14:44	1
Methylcyclohexane	1.0	U	1.0	0.45	ug/L			02/21/18 14:44	1
Methylene Chloride	5.0	U	5.0	0.53	ug/L			02/21/18 14:44	1
4-Methyl-2-pentanone (MIBK)	10	U	10	0.71	ug/L			02/21/18 14:44	1
Methyl tert-butyl ether	1.0	U	1.0	0.27	ug/L			02/21/18 14:44	1
Styrene	1.0	U	1.0	0.23	ug/L			02/21/18 14:44	1
1,1,2,2-Tetrachloroethane	1.0	U *	1.0	0.32	ug/L			02/21/18 14:44	1
Tetrachloroethene	1.0	U	1.0	0.30	ug/L			02/21/18 14:44	1
Toluene	1.0	U *	1.0	0.23	ug/L			02/21/18 14:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.29	ug/L			02/21/18 14:44	1
trans-1,3-Dichloropropene	1.0	U	1.0	0.31	ug/L			02/21/18 14:44	1
1,2,4-Trichlorobenzene	1.0	U	1.0	0.27	ug/L			02/21/18 14:44	1
1,1,1-Trichloroethane	1.0	U	1.0	0.23	ug/L			02/21/18 14:44	1

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

TestAmerica Job ID: 240-91639-1

Client Sample ID: MW-19_021418
Date Collected: 02/14/18 10:10
Date Received: 02/17/18 09:30

Lab Sample ID: 240-91639-1
Matrix: Water

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			02/21/18 14:44	1
Trichloroethene	**1.0**		1.0	0.33	ug/L			02/21/18 14:44	1
Trichlorofluoromethane	1.0	U	1.0	0.50	ug/L			02/21/18 14:44	1
1,1,2-Trichloro-1,2,2-trifluoroethane	1.0	U	1.0	0.41	ug/L			02/21/18 14:44	1
1,2,3-Trimethylbenzene	5.0	U	5.0	0.22	ug/L			02/21/18 14:44	1
1,2,4-Trimethylbenzene	1.0	U	1.0	0.24	ug/L			02/21/18 14:44	1
1,3,5-Trimethylbenzene	1.0	U	1.0	0.24	ug/L			02/21/18 14:44	1
Vinyl chloride	**1.5**		1.0	0.45	ug/L			02/21/18 14:44	1
Xylenes, Total	2.0	U	2.0	0.24	ug/L			02/21/18 14:44	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*76*		*69 - 120*		*02/21/18 14:44*	*1*
Dibromofluoromethane (Surr)	*99*		*69 - 124*		*02/21/18 14:44*	*1*
1,2-Dichloroethane-d4 (Surr)	*107*		*61 - 138*		*02/21/18 14:44*	*1*
Toluene-d8 (Surr)	*109*		*73 - 120*		*02/21/18 14:44*	*1*

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

TestAmerica Job ID: 240-91639-1

Client Sample ID: MW-29_021418
Date Collected: 02/14/18 11:30
Date Received: 02/17/18 09:30

Lab Sample ID: 240-91639-2
Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.90	J	2.0	0.24	ug/L			02/26/18 13:55	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*63 - 125*		*02/26/18 13:55*	*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			02/21/18 15:06	1
Benzene	1.0	U	1.0	0.28	ug/L			02/21/18 15:06	1
Bromodichloromethane	1.0	U	1.0	0.30	ug/L			02/21/18 15:06	1
Bromoform	1.0	U	1.0	0.43	ug/L			02/21/18 15:06	1
Bromomethane	1.0	U	1.0	0.42	ug/L			02/21/18 15:06	1
2-Butanone (MEK)	10	U	10	1.0	ug/L			02/21/18 15:06	1
Carbon disulfide	5.0	U	5.0	0.34	ug/L			02/21/18 15:06	1
Carbon tetrachloride	1.0	U	1.0	0.35	ug/L			02/21/18 15:06	1
Chlorobenzene	1.0	U	1.0	0.32	ug/L			02/21/18 15:06	1
Chloroethane	1.0	U	1.0	0.41	ug/L			02/21/18 15:06	1
Chloroform	1.0	U	1.0	0.31	ug/L			02/21/18 15:06	1
Chloromethane	1.0	U	1.0	0.43	ug/L			02/21/18 15:06	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.30	ug/L			02/21/18 15:06	1
cis-1,3-Dichloropropene	1.0	U	1.0	0.26	ug/L			02/21/18 15:06	1
Cyclohexane	1.0	U	1.0	0.44	ug/L			02/21/18 15:06	1
Dibromochloromethane	1.0	U	1.0	0.25	ug/L			02/21/18 15:06	1
1,2-Dibromo-3-Chloropropane	1.0	U	1.0	0.47	ug/L			02/21/18 15:06	1
1,2-Dibromoethane	1.0	U	1.0	0.23	ug/L			02/21/18 15:06	1
1,2-Dichlorobenzene	1.0	U	1.0	0.26	ug/L			02/21/18 15:06	1
1,3-Dichlorobenzene	1.0	U	1.0	0.32	ug/L			02/21/18 15:06	1
1,4-Dichlorobenzene	1.0	U	1.0	0.23	ug/L			02/21/18 15:06	1
Dichlorodifluoromethane	1.0	U	1.0	0.50	ug/L			02/21/18 15:06	1
1,1-Dichloroethane	1.0	U	1.0	0.25	ug/L			02/21/18 15:06	1
1,2-Dichloroethane	1.0	U	1.0	0.30	ug/L			02/21/18 15:06	1
1,1-Dichloroethene	1.0	U	1.0	0.27	ug/L			02/21/18 15:06	1
1,2-Dichloropropane	1.0	U	1.0	0.30	ug/L			02/21/18 15:06	1
Diethyl ether	2.0	U	2.0	0.35	ug/L			02/21/18 15:06	1
Ethylbenzene	1.0	U	1.0	0.26	ug/L			02/21/18 15:06	1
2-Hexanone	10	U	10	1.2	ug/L			02/21/18 15:06	1
Isopropylbenzene	1.0	U	1.0	0.21	ug/L			02/21/18 15:06	1
Methyl acetate	10	U	10	1.4	ug/L			02/21/18 15:06	1
Methylcyclohexane	1.0	U	1.0	0.45	ug/L			02/21/18 15:06	1
Methylene Chloride	5.0	U	5.0	0.53	ug/L			02/21/18 15:06	1
4-Methyl-2-pentanone (MIBK)	10	U	10	0.71	ug/L			02/21/18 15:06	1
Methyl tert-butyl ether	1.0	U	1.0	0.27	ug/L			02/21/18 15:06	1
Styrene	1.0	U	1.0	0.23	ug/L			02/21/18 15:06	1
1,1,2,2-Tetrachloroethane	1.0	U *	1.0	0.32	ug/L			02/21/18 15:06	1
Tetrachloroethene	1.0	U	1.0	0.30	ug/L			02/21/18 15:06	1
Toluene	1.0	U *	1.0	0.23	ug/L			02/21/18 15:06	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.29	ug/L			02/21/18 15:06	1
trans-1,3-Dichloropropene	1.0	U	1.0	0.31	ug/L			02/21/18 15:06	1
1,2,4-Trichlorobenzene	1.0	U	1.0	0.27	ug/L			02/21/18 15:06	1
1,1,1-Trichloroethane	1.0	U	1.0	0.23	ug/L			02/21/18 15:06	1

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

TestAmerica Job ID: 240-91639-1

Client Sample ID: MW-29_021418
Date Collected: 02/14/18 11:30
Date Received: 02/17/18 09:30

Lab Sample ID: 240-91639-2
Matrix: Water

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			02/21/18 15:06	1
Trichloroethene	1.0	U	1.0	0.33	ug/L			02/21/18 15:06	1
Trichlorofluoromethane	1.0	U	1.0	0.50	ug/L			02/21/18 15:06	1
1,1,2-Trichloro-1,2,2-trifluoroethane	1.0	U	1.0	0.41	ug/L			02/21/18 15:06	1
1,2,3-Trimethylbenzene	5.0	U	5.0	0.22	ug/L			02/21/18 15:06	1
1,2,4-Trimethylbenzene	1.0	U	1.0	0.24	ug/L			02/21/18 15:06	1
1,3,5-Trimethylbenzene	1.0	U	1.0	0.24	ug/L			02/21/18 15:06	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			02/21/18 15:06	1
Xylenes, Total	2.0	U	2.0	0.24	ug/L			02/21/18 15:06	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*81*		*69 - 120*		*02/21/18 15:06*	*1*
Dibromofluoromethane (Surr)	*103*		*69 - 124*		*02/21/18 15:06*	*1*
1,2-Dichloroethane-d4 (Surr)	*108*		*61 - 138*		*02/21/18 15:06*	*1*
Toluene-d8 (Surr)	*110*		*73 - 120*		*02/21/18 15:06*	*1*

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

TestAmerica Job ID: 240-91639-1

Client Sample ID: MW-33_021418
Date Collected: 02/14/18 15:55
Date Received: 02/17/18 09:30

Lab Sample ID: 240-91639-3
Matrix: Water

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			02/26/18 14:21	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*107*		*63 - 125*		*02/26/18 14:21*	*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			02/21/18 15:29	1
Benzene	1.0	U	1.0	0.28	ug/L			02/21/18 15:29	1
Bromodichloromethane	1.0	U	1.0	0.30	ug/L			02/21/18 15:29	1
Bromoform	1.0	U	1.0	0.43	ug/L			02/21/18 15:29	1
Bromomethane	1.0	U	1.0	0.42	ug/L			02/21/18 15:29	1
2-Butanone (MEK)	10	U	10	1.0	ug/L			02/21/18 15:29	1
Carbon disulfide	5.0	U	5.0	0.34	ug/L			02/21/18 15:29	1
Carbon tetrachloride	1.0	U	1.0	0.35	ug/L			02/21/18 15:29	1
Chlorobenzene	1.0	U	1.0	0.32	ug/L			02/21/18 15:29	1
Chloroethane	1.0	U	1.0	0.41	ug/L			02/21/18 15:29	1
Chloroform	1.0	U	1.0	0.31	ug/L			02/21/18 15:29	1
Chloromethane	1.0	U	1.0	0.43	ug/L			02/21/18 15:29	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.30	ug/L			02/21/18 15:29	1
cis-1,3-Dichloropropene	1.0	U	1.0	0.26	ug/L			02/21/18 15:29	1
Cyclohexane	1.0	U	1.0	0.44	ug/L			02/21/18 15:29	1
Dibromochloromethane	1.0	U	1.0	0.25	ug/L			02/21/18 15:29	1
1,2-Dibromo-3-Chloropropane	1.0	U	1.0	0.47	ug/L			02/21/18 15:29	1
1,2-Dibromoethane	1.0	U	1.0	0.23	ug/L			02/21/18 15:29	1
1,2-Dichlorobenzene	1.0	U	1.0	0.26	ug/L			02/21/18 15:29	1
1,3-Dichlorobenzene	1.0	U	1.0	0.32	ug/L			02/21/18 15:29	1
1,4-Dichlorobenzene	1.0	U	1.0	0.23	ug/L			02/21/18 15:29	1
Dichlorodifluoromethane	1.0	U	1.0	0.50	ug/L			02/21/18 15:29	1
1,1-Dichloroethane	1.0	U	1.0	0.25	ug/L			02/21/18 15:29	1
1,2-Dichloroethane	1.0	U	1.0	0.30	ug/L			02/21/18 15:29	1
1,1-Dichloroethene	1.0	U	1.0	0.27	ug/L			02/21/18 15:29	1
1,2-Dichloropropane	1.0	U	1.0	0.30	ug/L			02/21/18 15:29	1
Diethyl ether	2.0	U	2.0	0.35	ug/L			02/21/18 15:29	1
Ethylbenzene	1.0	U	1.0	0.26	ug/L			02/21/18 15:29	1
2-Hexanone	10	U	10	1.2	ug/L			02/21/18 15:29	1
Isopropylbenzene	1.0	U	1.0	0.21	ug/L			02/21/18 15:29	1
Methyl acetate	10	U	10	1.4	ug/L			02/21/18 15:29	1
Methylcyclohexane	1.0	U	1.0	0.45	ug/L			02/21/18 15:29	1
Methylene Chloride	5.0	U	5.0	0.53	ug/L			02/21/18 15:29	1
4-Methyl-2-pentanone (MIBK)	10	U	10	0.71	ug/L			02/21/18 15:29	1
Methyl tert-butyl ether	1.0	U	1.0	0.27	ug/L			02/21/18 15:29	1
Styrene	1.0	U	1.0	0.23	ug/L			02/21/18 15:29	1
1,1,2,2-Tetrachloroethane	1.0	U *	1.0	0.32	ug/L			02/21/18 15:29	1
Tetrachloroethene	1.0	U	1.0	0.30	ug/L			02/21/18 15:29	1
Toluene	1.0	U *	1.0	0.23	ug/L			02/21/18 15:29	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.29	ug/L			02/21/18 15:29	1
trans-1,3-Dichloropropene	1.0	U	1.0	0.31	ug/L			02/21/18 15:29	1
1,2,4-Trichlorobenzene	1.0	U	1.0	0.27	ug/L			02/21/18 15:29	1
1,1,1-Trichloroethane	1.0	U	1.0	0.23	ug/L			02/21/18 15:29	1

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

TestAmerica Job ID: 240-91639-1

Client Sample ID: MW-33_021418
Date Collected: 02/14/18 15:55
Date Received: 02/17/18 09:30

Lab Sample ID: 240-91639-3
Matrix: Water

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			02/21/18 15:29	1
Trichloroethene	1.0	U	1.0	0.33	ug/L			02/21/18 15:29	1
Trichlorofluoromethane	1.0	U	1.0	0.50	ug/L			02/21/18 15:29	1
1,1,2-Trichloro-1,2,2-trifluoroethane	1.0	U	1.0	0.41	ug/L			02/21/18 15:29	1
1,2,3-Trimethylbenzene	5.0	U	5.0	0.22	ug/L			02/21/18 15:29	1
1,2,4-Trimethylbenzene	1.0	U	1.0	0.24	ug/L			02/21/18 15:29	1
1,3,5-Trimethylbenzene	1.0	U	1.0	0.24	ug/L			02/21/18 15:29	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			02/21/18 15:29	1
Xylenes, Total	2.0	U	2.0	0.24	ug/L			02/21/18 15:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*74*		*69 - 120*		*02/21/18 15:29*	*1*
Dibromofluoromethane (Surr)	*103*		*69 - 124*		*02/21/18 15:29*	*1*
1,2-Dichloroethane-d4 (Surr)	*116*		*61 - 138*		*02/21/18 15:29*	*1*
Toluene-d8 (Surr)	*104*		*73 - 120*		*02/21/18 15:29*	*1*

Surrogate Summary

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

TestAmerica Job ID: 240-91639-1

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

Matrix: Water **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)			
		BFB	DBFM	DCA	TOL
Lab Sample ID	Client Sample ID	(69-120)	(69-124)	(61-138)	(73-120)
240-91639-1	MW-19_021418	76	99	107	109
240-91639-2	MW-29_021418	81	103	108	110
240-91639-3	MW-33_021418	74	103	116	104
240-91640-E-7 MSD	Matrix Spike Duplicate	92	101	111	113
240-91640-F-7 MS	Matrix Spike	85	102	109	111
LCS 240-315600/4	Lab Control Sample	83	96	108	109
MB 240-315600/6	Method Blank	76	98	106	107

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)
		DCA
Lab Sample ID	Client Sample ID	(63-125)
240-91639-1	MW-19_021418	117
240-91639-2	MW-29_021418	107
240-91639-3	MW-33_021418	107
240-91640-I-7 MS	Matrix Spike	108
240-91640-I-7 MSD	Matrix Spike Duplicate	116
240-91647-F-14 MS	Matrix Spike	115
240-91647-F-14 MSD	Matrix Spike Duplicate	124
LCS 240-315955/4	Lab Control Sample	103
LCS 240-316152/4	Lab Control Sample	110
MB 240-315955/5	Method Blank	122
MB 240-316152/5	Method Blank	111

Surrogate Legend

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

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

Lab Sample ID: MB 240-315600/6
Matrix: Water
Analysis Batch: 315600

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			02/21/18 14:21	1
Benzene	1.0	U	1.0	0.28	ug/L			02/21/18 14:21	1
Bromodichloromethane	1.0	U	1.0	0.30	ug/L			02/21/18 14:21	1
Bromoform	1.0	U	1.0	0.43	ug/L			02/21/18 14:21	1
Bromomethane	1.0	U	1.0	0.42	ug/L			02/21/18 14:21	1
2-Butanone (MEK)	10	U	10	1.0	ug/L			02/21/18 14:21	1
Carbon disulfide	5.0	U	5.0	0.34	ug/L			02/21/18 14:21	1
Carbon tetrachloride	1.0	U	1.0	0.35	ug/L			02/21/18 14:21	1
Chlorobenzene	1.0	U	1.0	0.32	ug/L			02/21/18 14:21	1
Chloroethane	1.0	U	1.0	0.41	ug/L			02/21/18 14:21	1
Chloroform	1.0	U	1.0	0.31	ug/L			02/21/18 14:21	1
Chloromethane	1.0	U	1.0	0.43	ug/L			02/21/18 14:21	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.30	ug/L			02/21/18 14:21	1
cis-1,3-Dichloropropene	1.0	U	1.0	0.26	ug/L			02/21/18 14:21	1
Cyclohexane	1.0	U	1.0	0.44	ug/L			02/21/18 14:21	1
Dibromochloromethane	1.0	U	1.0	0.25	ug/L			02/21/18 14:21	1
1,2-Dibromo-3-Chloropropane	1.0	U	1.0	0.47	ug/L			02/21/18 14:21	1
1,2-Dibromoethane	1.0	U	1.0	0.23	ug/L			02/21/18 14:21	1
1,2-Dichlorobenzene	1.0	U	1.0	0.26	ug/L			02/21/18 14:21	1
1,3-Dichlorobenzene	1.0	U	1.0	0.32	ug/L			02/21/18 14:21	1
1,4-Dichlorobenzene	1.0	U	1.0	0.23	ug/L			02/21/18 14:21	1
Dichlorodifluoromethane	1.0	U	1.0	0.50	ug/L			02/21/18 14:21	1
1,1-Dichloroethane	1.0	U	1.0	0.25	ug/L			02/21/18 14:21	1
1,2-Dichloroethane	1.0	U	1.0	0.30	ug/L			02/21/18 14:21	1
1,1-Dichloroethene	1.0	U	1.0	0.27	ug/L			02/21/18 14:21	1
1,2-Dichloropropane	1.0	U	1.0	0.30	ug/L			02/21/18 14:21	1
Diethyl ether	2.0	U	2.0	0.35	ug/L			02/21/18 14:21	1
Ethylbenzene	1.0	U	1.0	0.26	ug/L			02/21/18 14:21	1
2-Hexanone	10	U	10	1.2	ug/L			02/21/18 14:21	1
Isopropylbenzene	1.0	U	1.0	0.21	ug/L			02/21/18 14:21	1
Methyl acetate	10	U	10	1.4	ug/L			02/21/18 14:21	1
Methylcyclohexane	1.0	U	1.0	0.45	ug/L			02/21/18 14:21	1
Methylene Chloride	5.0	U	5.0	0.53	ug/L			02/21/18 14:21	1
4-Methyl-2-pentanone (MIBK)	10	U	10	0.71	ug/L			02/21/18 14:21	1
Methyl tert-butyl ether	1.0	U	1.0	0.27	ug/L			02/21/18 14:21	1
Styrene	1.0	U	1.0	0.23	ug/L			02/21/18 14:21	1
1,1,2,2-Tetrachloroethane	1.0	U	1.0	0.32	ug/L			02/21/18 14:21	1
Tetrachloroethene	1.0	U	1.0	0.30	ug/L			02/21/18 14:21	1
Toluene	1.0	U	1.0	0.23	ug/L			02/21/18 14:21	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.29	ug/L			02/21/18 14:21	1
trans-1,3-Dichloropropene	1.0	U	1.0	0.31	ug/L			02/21/18 14:21	1
1,2,4-Trichlorobenzene	1.0	U	1.0	0.27	ug/L			02/21/18 14:21	1
1,1,1-Trichloroethane	1.0	U	1.0	0.23	ug/L			02/21/18 14:21	1
1,1,2-Trichloroethane	1.0	U	1.0	0.34	ug/L			02/21/18 14:21	1
Trichloroethene	1.0	U	1.0	0.33	ug/L			02/21/18 14:21	1
Trichlorofluoromethane	1.0	U	1.0	0.50	ug/L			02/21/18 14:21	1
1,1,2-Trichloro-1,2,2-trifluoroethane	1.0	U	1.0	0.41	ug/L			02/21/18 14:21	1
1,2,3-Trimethylbenzene	5.0	U	5.0	0.22	ug/L			02/21/18 14:21	1

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

Lab Sample ID: MB 240-315600/6
Matrix: Water
Analysis Batch: 315600

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			02/21/18 14:21	1
1,3,5-Trimethylbenzene	1.0	U	1.0	0.24	ug/L			02/21/18 14:21	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			02/21/18 14:21	1
Xylenes, Total	2.0	U	2.0	0.24	ug/L			02/21/18 14:21	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
4-Bromofluorobenzene (Surr)	*76*		*69 - 120*		*02/21/18 14:21*	*1*
Dibromofluoromethane (Surr)	*98*		*69 - 124*		*02/21/18 14:21*	*1*
1,2-Dichloroethane-d4 (Surr)	*106*		*61 - 138*		*02/21/18 14:21*	*1*
Toluene-d8 (Surr)	*107*		*73 - 120*		*02/21/18 14:21*	*1*

Lab Sample ID: LCS 240-315600/4
Matrix: Water
Analysis Batch: 315600

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	12.0		ug/L		60	35 - 131
Benzene	10.0	10.9		ug/L		109	79 - 120
Bromodichloromethane	10.0	10.8		ug/L		108	79 - 125
Bromoform	10.0	8.32		ug/L		83	55 - 145
Bromomethane	10.0	8.81		ug/L		88	17 - 158
2-Butanone (MEK)	20.0	18.6		ug/L		93	43 - 149
Carbon disulfide	10.0	10.9		ug/L		109	49 - 141
Carbon tetrachloride	10.0	11.0		ug/L		110	55 - 171
Chlorobenzene	10.0	10.4		ug/L		104	80 - 120
Chloroethane	10.0	10.7		ug/L		107	10 - 149
Chloroform	10.0	11.5		ug/L		115	80 - 120
Chloromethane	10.0	11.5		ug/L		115	59 - 124
cis-1,2-Dichloroethene	10.0	10.5		ug/L		105	77 - 120
cis-1,3-Dichloropropene	10.0	10.7		ug/L		107	75 - 120
Cyclohexane	10.0	12.2		ug/L		122	66 - 135
Dibromochloromethane	10.0	10.3		ug/L		103	64 - 129
1,2-Dibromo-3-Chloropropane	10.0	8.87		ug/L		89	50 - 130
1,2-Dibromoethane	10.0	10.5		ug/L		105	80 - 120
1,2-Dichlorobenzene	10.0	10.4		ug/L		104	80 - 120
1,3-Dichlorobenzene	10.0	9.89		ug/L		99	80 - 120
1,4-Dichlorobenzene	10.0	10.5		ug/L		105	80 - 120
Dichlorodifluoromethane	10.0	10.4		ug/L		104	42 - 141
1,1-Dichloroethane	10.0	11.4		ug/L		114	74 - 120
1,2-Dichloroethane	10.0	11.0		ug/L		110	68 - 133
1,1-Dichloroethene	10.0	9.36		ug/L		94	65 - 127
1,2-Dichloropropane	10.0	11.9		ug/L		119	78 - 127
Diethyl ether	10.0	9.92		ug/L		99	72 - 125
Ethylbenzene	10.0	10.5		ug/L		105	80 - 120
2-Hexanone	20.0	20.7		ug/L		103	28 - 169
Isopropylbenzene	10.0	9.26		ug/L		93	80 - 128
Methyl acetate	20.0	20.9		ug/L		105	63 - 137
Methylcyclohexane	10.0	9.93		ug/L		99	63 - 141

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

Lab Sample ID: LCS 240-315600/4
Matrix: Water
Analysis Batch: 315600

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	10.5		ug/L		105	64 - 140
4-Methyl-2-pentanone (MIBK)	20.0	20.6		ug/L		103	53 - 144
Methyl tert-butyl ether	10.0	9.56		ug/L		96	73 - 120
Styrene	10.0	9.33		ug/L		93	80 - 121
1,1,2,2-Tetrachloroethane	10.0	13.0	*	ug/L		130	58 - 122
Tetrachloroethene	10.0	9.82		ug/L		98	80 - 122
Toluene	10.0	12.2	*	ug/L		122	78 - 120
trans-1,2-Dichloroethene	10.0	10.5		ug/L		105	74 - 124
trans-1,3-Dichloropropene	10.0	11.6		ug/L		116	67 - 120
1,2,4-Trichlorobenzene	10.0	9.66		ug/L		97	34 - 141
1,1,1-Trichloroethane	10.0	11.9		ug/L		119	64 - 147
1,1,2-Trichloroethane	10.0	11.8		ug/L		118	76 - 121
Trichloroethene	10.0	8.83		ug/L		88	76 - 124
Trichlorofluoromethane	10.0	11.6		ug/L		116	27 - 176
1,1,2-Trichloro-1,2,2-trifluoroethane	10.0	8.43		ug/L		84	65 - 144
1,2,4-Trimethylbenzene	10.0	11.0		ug/L		110	80 - 120
1,3,5-Trimethylbenzene	10.0	11.0		ug/L		110	79 - 120
Vinyl chloride	10.0	11.2		ug/L		112	65 - 124
Xylenes, Total	20.0	20.5		ug/L		103	80 - 120
1,4-Dioxane	200	140		ug/L		70	35 - 134

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*83*		*69 - 120*
Dibromofluoromethane (Surr)	*96*		*69 - 124*
1,2-Dichloroethane-d4 (Surr)	*108*		*61 - 138*
Toluene-d8 (Surr)	*109*		*73 - 120*

Lab Sample ID: 240-91640-E-7 MSD
Matrix: Water
Analysis Batch: 315600

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	16.8		ug/L		84	19 - 133	23	35
Benzene	1.0	U	10.0	11.4		ug/L		114	69 - 127	2	10
Bromodichloromethane	1.0	U	10.0	11.3		ug/L		113	75 - 128	4	13
Bromoform	1.0	U	10.0	8.72		ug/L		87	61 - 135	10	13
Bromomethane	1.0	U	10.0	8.96		ug/L		90	10 - 148	11	35
2-Butanone (MEK)	10	U	20.0	18.8		ug/L		94	34 - 153	6	23
Carbon disulfide	5.0	U	10.0	10.8		ug/L		108	46 - 143	10	18
Carbon tetrachloride	1.0	U	10.0	10.7		ug/L		107	53 - 175	0	17
Chlorobenzene	1.0	U	10.0	10.6		ug/L		106	76 - 120	0	12
Chloroethane	1.0	U	10.0	10.3		ug/L		103	10 - 141	11	35
Chloroform	1.0	U	10.0	11.4		ug/L		114	74 - 125	5	11
Chloromethane	1.0	U	10.0	11.5		ug/L		115	34 - 127	4	25
cis-1,2-Dichloroethene	12		10.0	23.5		ug/L		112	69 - 127	0	11
cis-1,3-Dichloropropene	1.0	U	10.0	10.1		ug/L		101	68 - 120	3	13
Cyclohexane	1.0	U	10.0	11.9		ug/L		119	56 - 135	18	35

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

Lab Sample ID: 240-91640-E-7 MSD
Matrix: Water
Analysis Batch: 315600

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
Dibromochloromethane	1.0	U	10.0	10.4		ug/L		104	62 - 131	5	15
1,2-Dibromo-3-Chloropropane	1.0	U	10.0	9.47		ug/L		95	48 - 130	10	31
1,2-Dibromoethane	1.0	U	10.0	10.6		ug/L		106	73 - 121	2	12
1,2-Dichlorobenzene	1.0	U	10.0	10.3		ug/L		103	70 - 120	0	19
1,3-Dichlorobenzene	1.0	U	10.0	9.55		ug/L		96	71 - 120	4	18
1,4-Dichlorobenzene	1.0	U	10.0	9.74		ug/L		97	72 - 120	3	17
Dichlorodifluoromethane	1.0	U	10.0	10.3		ug/L		103	45 - 130	16	34
1,1-Dichloroethane	1.0	U	10.0	11.8		ug/L		118	69 - 122	2	11
1,2-Dichloroethane	1.0	U	10.0	12.1		ug/L		121	64 - 138	3	11
1,1-Dichloroethene	1.0	U	10.0	9.16		ug/L		92	62 - 127	0	14
1,2-Dichloropropane	1.0	U	10.0	12.1		ug/L		121	72 - 131	2	12
Diethyl ether	2.0	U	10.0	11.0		ug/L		110	65 - 124	11	11
Ethylbenzene	1.0	U	10.0	10.6		ug/L		106	72 - 121	1	15
2-Hexanone	10	U F2	20.0	21.9	F2	ug/L		110	21 - 184	16	12
Isopropylbenzene	1.0	U	10.0	9.37		ug/L		94	70 - 132	5	16
Methyl acetate	10	U	20.0	23.7		ug/L		119	52 - 139	12	14
Methylcyclohexane	1.0	U	10.0	9.06		ug/L		91	46 - 139	20	35
Methylene Chloride	5.0	U	10.0	10.8		ug/L		108	52 - 137	9	12
4-Methyl-2-pentanone (MIBK)	10	U	20.0	22.1		ug/L		110	53 - 147	15	16
Methyl tert-butyl ether	1.0	U	10.0	10.4		ug/L		104	67 - 125	6	12
Styrene	1.0	U	10.0	9.77		ug/L		98	74 - 125	2	14
1,1,2,2-Tetrachloroethane	1.0	U F1 *	10.0	13.7	F1	ug/L		137	51 - 123	14	17
Tetrachloroethene	1.0	U	10.0	9.55		ug/L		95	69 - 126	2	18
Toluene	1.0	U *	10.0	12.0		ug/L		120	69 - 125	1	14
trans-1,2-Dichloroethene	1.0	U	10.0	10.8		ug/L		108	66 - 131	4	11
trans-1,3-Dichloropropene	1.0	U	10.0	11.3		ug/L		113	59 - 120	2	14
1,2,4-Trichlorobenzene	1.0	U	10.0	8.63		ug/L		86	26 - 138	6	35
1,1,1-Trichloroethane	1.0	U	10.0	11.7		ug/L		117	57 - 156	3	13
1,1,2-Trichloroethane	1.0	U	10.0	12.1		ug/L		121	68 - 127	6	11
Trichloroethene	1.0	U	10.0	9.92		ug/L		99	68 - 129	2	12
Trichlorofluoromethane	1.0	U	10.0	10.7		ug/L		107	28 - 172	16	26
1,1,2-Trichloro-1,2,2-trifluoroethane	1.0	U	10.0	7.80		ug/L		78	58 - 137	20	35
1,2,4-Trimethylbenzene	1.0	U	10.0	10.2		ug/L		102	64 - 120	4	22
1,3,5-Trimethylbenzene	1.0	U	10.0	10.7		ug/L		107	67 - 120	0	25
Vinyl chloride	18		10.0	28.8		ug/L		108	55 - 123	3	12
Xylenes, Total	2.0	U	20.0	20.5		ug/L		102	71 - 122	2	14
1,4-Dioxane	50	U	200	153		ug/L		76	13 - 155	27	35

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*92*		*69 - 120*
Dibromofluoromethane (Surr)	*101*		*69 - 124*
1,2-Dichloroethane-d4 (Surr)	*111*		*61 - 138*
Toluene-d8 (Surr)	*113*		*73 - 120*

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

Lab Sample ID: 240-91640-F-7 MS
Matrix: Water
Analysis Batch: 315600

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	13.3		ug/L		66	19 - 133
Benzene	1.0	U	10.0	11.6		ug/L		116	69 - 127
Bromodichloromethane	1.0	U	10.0	11.7		ug/L		117	75 - 128
Bromoform	1.0	U	10.0	7.89		ug/L		79	61 - 135
Bromomethane	1.0	U	10.0	7.99		ug/L		80	10 - 148
2-Butanone (MEK)	10	U	20.0	17.7		ug/L		89	34 - 153
Carbon disulfide	5.0	U	10.0	9.74		ug/L		97	46 - 143
Carbon tetrachloride	1.0	U	10.0	10.7		ug/L		107	53 - 175
Chlorobenzene	1.0	U	10.0	10.6		ug/L		106	76 - 120
Chloroethane	1.0	U	10.0	11.5		ug/L		115	10 - 141
Chloroform	1.0	U	10.0	12.0		ug/L		120	74 - 125
Chloromethane	1.0	U	10.0	11.9		ug/L		119	34 - 127
cis-1,2-Dichloroethene	12		10.0	23.5		ug/L		112	69 - 127
cis-1,3-Dichloropropene	1.0	U	10.0	10.4		ug/L		104	68 - 120
Cyclohexane	1.0	U	10.0	9.89		ug/L		99	56 - 135
Dibromochloromethane	1.0	U	10.0	9.98		ug/L		100	62 - 131
1,2-Dibromo-3-Chloropropane	1.0	U	10.0	8.58		ug/L		86	48 - 130
1,2-Dibromoethane	1.0	U	10.0	10.4		ug/L		104	73 - 121
1,2-Dichlorobenzene	1.0	U	10.0	10.3		ug/L		103	70 - 120
1,3-Dichlorobenzene	1.0	U	10.0	9.93		ug/L		99	71 - 120
1,4-Dichlorobenzene	1.0	U	10.0	10.0		ug/L		100	72 - 120
Dichlorodifluoromethane	1.0	U	10.0	8.81		ug/L		88	45 - 130
1,1-Dichloroethane	1.0	U	10.0	12.0		ug/L		120	69 - 122
1,2-Dichloroethane	1.0	U	10.0	11.8		ug/L		118	64 - 138
1,1-Dichloroethene	1.0	U	10.0	9.16		ug/L		92	62 - 127
1,2-Dichloropropane	1.0	U	10.0	12.3		ug/L		123	72 - 131
Diethyl ether	2.0	U	10.0	9.87		ug/L		99	65 - 124
Ethylbenzene	1.0	U	10.0	10.5		ug/L		105	72 - 121
2-Hexanone	10	U F2	20.0	18.6		ug/L		93	21 - 184
Isopropylbenzene	1.0	U	10.0	8.88		ug/L		89	70 - 132
Methyl acetate	10	U	20.0	21.1		ug/L		106	52 - 139
Methylcyclohexane	1.0	U	10.0	7.42		ug/L		74	46 - 139
Methylene Chloride	5.0	U	10.0	9.87		ug/L		99	52 - 137
4-Methyl-2-pentanone (MIBK)	10	U	20.0	18.9		ug/L		95	53 - 147
Methyl tert-butyl ether	1.0	U	10.0	9.82		ug/L		98	67 - 125
Styrene	1.0	U	10.0	9.53		ug/L		95	74 - 125
1,1,2,2-Tetrachloroethane	1.0	U F1 *	10.0	11.9		ug/L		119	51 - 123
Tetrachloroethene	1.0	U	10.0	9.78		ug/L		98	69 - 126
Toluene	1.0	U *	10.0	11.9		ug/L		119	69 - 125
trans-1,2-Dichloroethene	1.0	U	10.0	11.3		ug/L		113	66 - 131
trans-1,3-Dichloropropene	1.0	U	10.0	11.0		ug/L		110	59 - 120
1,2,4-Trichlorobenzene	1.0	U	10.0	9.19		ug/L		92	26 - 138
1,1,1-Trichloroethane	1.0	U	10.0	12.1		ug/L		121	57 - 156
1,1,2-Trichloroethane	1.0	U	10.0	11.4		ug/L		114	68 - 127
Trichloroethene	1.0	U	10.0	9.76		ug/L		98	68 - 129
Trichlorofluoromethane	1.0	U	10.0	9.08		ug/L		91	28 - 172
1,1,2-Trichloro-1,2,2-trifluoroethane	1.0	U	10.0	6.40		ug/L		64	58 - 137

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

Lab Sample ID: 240-91640-F-7 MS
Matrix: Water
Analysis Batch: 315600

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
1,2,4-Trimethylbenzene	1.0	U	10.0	10.6		ug/L		106	64 - 120
1,3,5-Trimethylbenzene	1.0	U	10.0	10.7		ug/L		107	67 - 120
Vinyl chloride	18		10.0	27.8		ug/L		98	55 - 123
Xylenes, Total	2.0	U	20.0	20.1		ug/L		100	71 - 122
1,4-Dioxane	50	U	200	116		ug/L		58	13 - 155

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
4-Bromofluorobenzene (Surr)	*85*		*69 - 120*
Dibromofluoromethane (Surr)	*102*		*69 - 124*
1,2-Dichloroethane-d4 (Surr)	*109*		*61 - 138*
Toluene-d8 (Surr)	*111*		*73 - 120*

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

Lab Sample ID: MB 240-315955/5
Matrix: Water
Analysis Batch: 315955

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			02/23/18 12:02	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*122*		*63 - 125*		*02/23/18 12:02*	*1*

Lab Sample ID: LCS 240-315955/4
Matrix: Water
Analysis Batch: 315955

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	8.56		ug/L		86	59 - 131

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*103*		*63 - 125*

Lab Sample ID: 240-91647-F-14 MS
Matrix: Water
Analysis Batch: 315955

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	8.57		ug/L		86	52 - 129

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*115*		*63 - 125*

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

Lab Sample ID: 240-91647-F-14 MSD
Matrix: Water
Analysis Batch: 315955

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	8.78		ug/L		88	52 - 129	2	13

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*124*		*63 - 125*

Lab Sample ID: MB 240-316152/5
Matrix: Water
Analysis Batch: 316152

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			02/26/18 13:04	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*111*		*63 - 125*		*02/26/18 13:04*	*1*

Lab Sample ID: LCS 240-316152/4
Matrix: Water
Analysis Batch: 316152

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	9.43		ug/L		94	59 - 131

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*110*		*63 - 125*

Lab Sample ID: 240-91640-I-7 MS
Matrix: Water
Analysis Batch: 316152

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	8.73		ug/L		87	52 - 129

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*108*		*63 - 125*

Lab Sample ID: 240-91640-I-7 MSD
Matrix: Water
Analysis Batch: 316152

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	8.59		ug/L		86	52 - 129	2	13

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*116*		*63 - 125*

QC Association Summary

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

TestAmerica Job ID: 240-91639-1

GC/MS VOA

Analysis Batch: 315600

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-91639-1	MW-19_021418	Total/NA	Water	8260B	
240-91639-2	MW-29_021418	Total/NA	Water	8260B	
240-91639-3	MW-33_021418	Total/NA	Water	8260B	
MB 240-315600/6	Method Blank	Total/NA	Water	8260B	
LCS 240-315600/4	Lab Control Sample	Total/NA	Water	8260B	
240-91640-E-7 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
240-91640-F-7 MS	Matrix Spike	Total/NA	Water	8260B	

Analysis Batch: 315955

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-91639-1	MW-19_021418	Total/NA	Water	8260B SIM	
MB 240-315955/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-315955/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-91647-F-14 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-91647-F-14 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 316152

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-91639-2	MW-29_021418	Total/NA	Water	8260B SIM	
240-91639-3	MW-33_021418	Total/NA	Water	8260B SIM	
MB 240-316152/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-316152/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-91640-I-7 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-91640-I-7 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: 240-91639-1

Client Sample ID: MW-19_021418

Date Collected: 02/14/18 10:10
Date Received: 02/17/18 09:30

Lab Sample ID: 240-91639-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	315600	02/21/18 14:44	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	315955	02/23/18 21:58	SAM	TAL CAN

Client Sample ID: MW-29_021418

Date Collected: 02/14/18 11:30
Date Received: 02/17/18 09:30

Lab Sample ID: 240-91639-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	315600	02/21/18 15:06	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	316152	02/26/18 13:55	SAM	TAL CAN

Client Sample ID: MW-33_021418

Date Collected: 02/14/18 15:55
Date Received: 02/17/18 09:30

Lab Sample ID: 240-91639-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	315600	02/21/18 15:29	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	316152	02/26/18 14:21	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 - E203728

TestAmerica Job ID: 240-91639-1

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	02-23-18 *
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.

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

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

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Angela DeGrandis	Lab Contact: Denise Pohl	COC No: —
Company Name: Arcadis	Telephone: 248-994-2240	Telephone: 734-320-0065	Telephone: 330-966-9789	1 of 1 COCs
Address: 28550 Cabot Drive, Suite 500	Email: kristoffer.hinskey@arcadis.com	**Analysis Turnaround Time**		For lab use only
City/State/Zip: Novi, MI, 48377		TAT if different from below: ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day (10 day)		Walk-in client
Phone: 248-994-2240				Lab sampling
Project Name: Ford LTP	Method of Shipment/Carrier: TA PICK-UP			Job/SDG No:
Project Number: MI001386.0001.20000				
PO # MI001386.0001.20000	Shipping/Tracking No: —			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAcf NaOH	Unpres	Other: ICE	Filtered Sample (Y/N)	Composite=C / Grab=G	VOCs 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions:
MW-19_021418	2/14/18	10:10		X						X				X	N	G	X	X	
MW-29_021418	"	11:30		X						X				X	N	G	X	X	
MW-33_021418	"	15:55		X						X				X	N	G	X	X	

240-91639 Chain of Custody

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

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/QC Requirements & Comments:

Submit all results through Cadena at jim.tomalia@cadena.com. Cadena #E203728

Lab#: Level IV Reporting

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
DIVYA KAMATH	ARCADIS	2/14/18 16:45	ASHLEY REIBEL	ARCADIS	2/14/18 16:45
Ashley Reibel	ARCADIS	2/14/18 1745	Navi Fridge	ARCADIS	2/14/18 1745
Ashley Reibel	ARCADIS	2/16/18 1000	Jeri Hall POP	TAL	2/16/18 1001

Jeri Hall TAL 2/16/18 1050 1005

2-17-18 830

TestAmerica Canton Sample Receipt Form/Narrative **Login # : 91639**
Canton Facility

Client Arcadis Site Name — Cooler unpacked by:

Cooler Received on 2-17-18 Opened on 2-17-18

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. 1.4 °C Corrected Cooler Temp. 1.1 °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): ____

WI-NC-099