

# TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

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

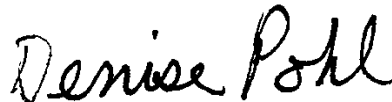
TestAmerica Job ID: 240-87717-1

Client Project/Site: Ford LTP Livonia MI

For:

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

Attn: Kristoffer Hinskey



Authorized for release by:  
11/21/2017 11:00:51 AM

Denise Pohl, Project Manager II  
(330)966-9789

[denise.pohl@testamericainc.com](mailto:denise.pohl@testamericainc.com)

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*This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.*

*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

TestAmerica Job ID: 240-87717-1

## Qualifiers

### GC/MS VOA

Qualifier	Qualifier Description
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
U	Indicates the analyte was analyzed for but not detected.
F2	MS/MSD RPD exceeds control limits
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
F1	MS and/or MSD Recovery is outside acceptance limits.

### GC VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

### Metals

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.

### General Chemistry

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
U	Indicates the analyte was analyzed for but not detected.

## 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

TestAmerica Job ID: 240-87717-1

**Job ID: 240-87717-1**

**Laboratory: TestAmerica Canton**

**Narrative**

## CASE NARRATIVE

**Client: ARCADIS U.S., Inc.**

**Project: Ford LTP Livonia MI**

**Report Number: 240-87717-1**

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 11/9/2017 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.2° C and 1.8° C.

### **VOLATILE ORGANIC COMPOUNDS (GCMS)**

Samples MW-72\_11072017 (240-87717-1), MW-73S\_11072017 (240-87717-2), MW-73D\_11072017 (240-87717-3), MW-74\_11072017 (240-87717-4), MW-85\_11072017 (240-87717-5) and DUP-1 (240-87717-6) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 11/15/2017.

Chloromethane failed the recovery criteria low for the MS of sample MW-72\_11072017MS (240-87717-1) in batch 240-303598. Chloromethane failed the recovery criteria low for the MSD of sample MW-72\_11072017MSD (240-87717-1) in batch 240-303598. Several analytes exceeded the RPD limit.

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-72\_11072017 (240-87717-1), MW-73S\_11072017 (240-87717-2), MW-73D\_11072017 (240-87717-3), MW-74\_11072017 (240-87717-4), MW-85\_11072017 (240-87717-5) and DUP-1 (240-87717-6) were analyzed for volatile organic compounds (GCMS SIM) in

# Case Narrative

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

TestAmerica Job ID: 240-87717-1

## Job ID: 240-87717-1 (Continued)

### Laboratory: TestAmerica Canton (Continued)

accordance with EPA SW-846 Method 8260B SIM. The samples were analyzed on 11/14/2017 and 11/15/2017.

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

#### DISSOLVED GASES

Sample MW-73S\_11072017 (240-87717-2) was analyzed for dissolved gases in accordance with RSK\_175. The sample was analyzed on 11/17/2017.

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

#### DISSOLVED METALS (ICPMS)

Sample MW-73S\_11072017 (240-87717-2) was analyzed for dissolved metals (ICPMS) in accordance with EPA SW-846 Method 6020. The sample was prepared on 11/10/2017 and analyzed on 11/13/2017.

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

#### TOTAL RECOVERABLE METALS (ICPMS)

Sample MW-73S\_11072017 (240-87717-2) was analyzed for total recoverable metals (ICPMS) in accordance with EPA SW-846 Method 6020. The sample was prepared on 11/10/2017 and analyzed on 11/13/2017.

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

#### TOTAL ORGANIC CARBON

Sample MW-73S\_11072017 (240-87717-2) was analyzed for total organic carbon in accordance with SM 5310. The sample was analyzed on 11/13/2017.

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

#### ANIONS

Sample MW-73S\_11072017 (240-87717-2) was analyzed for anions in accordance with EPA SW-846 Method 9056A. The sample was analyzed on 11/10/2017.

Method(s) 9056A: The following sample was received with less than 2 days remaining on the holding time or less than one shift (8 hours) remaining on a test with a holding time of 48 hours or less. As such, the laboratory had insufficient time remaining to perform the analysis within holding time: MW-73S\_11072017 (240-87717-2).

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

#### ANIONS

Sample MW-73S\_11072017 (240-87717-2) was analyzed for anions in accordance with EPA SW-846 Method 9056A. The sample was analyzed on 11/10/2017.

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

#### DISSOLVED ORGANIC CARBON

Sample MW-73S\_11072017 (240-87717-2) was analyzed for dissolved organic carbon in accordance with SM 5310\_DOC\_C. The sample was analyzed on 11/16/2017.

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

TestAmerica Job ID: 240-87717-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
RSK-175	Dissolved Gases (GC)	RSK	TAL CAN
6020	Metals (ICP/MS)	SW846	TAL CAN
5310 C-2000	Organic Carbon, Dissolved (DOC)	SM	TAL CAN
5310C-2000	Total Organic Carbon/Persulfate - Ultrav	SM	TAL CAN
9056A	Anions, Ion Chromatography	SW846	TAL CAN

#### Protocol References:

RSK = Sample Prep And Calculations For Dissolved Gas Analysis In Water Samples Using A GC Headspace Equilibration Technique, RSKSOP-175, Rev. 0, 8/11/94, USEPA Research Lab  
SM = "Standard Methods For The Examination Of Water And Wastewater",  
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

TestAmerica Job ID: 240-87717-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-87717-1	MW-72_11072017	Water	11/07/17 09:40	11/09/17 09:30
240-87717-2	MW-73S_11072017	Water	11/07/17 12:00	11/09/17 09:30
240-87717-3	MW-73D_11072017	Water	11/07/17 13:30	11/09/17 09:30
240-87717-4	MW-74_11072017	Water	11/07/17 15:10	11/09/17 09:30
240-87717-5	MW-85_11072017	Water	11/07/17 16:25	11/09/17 09:30
240-87717-6	DUP-1	Water	11/07/17 00:00	11/09/17 09:30

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# Detection Summary

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

TestAmerica Job ID: 240-87717-1

## Client Sample ID: MW-72\_11072017

## Lab Sample ID: 240-87717-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.97	J	2.0	0.24	ug/L	1		8260B SIM	Total/NA
Vinyl chloride	1.6		1.0	0.45	ug/L	1		8260B	Total/NA

## Client Sample ID: MW-73S\_11072017

## Lab Sample ID: 240-87717-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	1.8		1.0	0.30	ug/L	1		8260B	Total/NA
Trichloroethene	0.48	J	1.0	0.33	ug/L	1		8260B	Total/NA
Vinyl chloride	1.9		1.0	0.45	ug/L	1		8260B	Total/NA
Methane	24		1.0	0.17	ug/L	1		RSK-175	Total/NA
Iron	1200		100	47	ug/L	1		6020	Total Recoverable
Manganese	890		5.0	2.1	ug/L	1		6020	Total Recoverable
Iron	1200		100	47	ug/L	1		6020	Dissolved
Manganese	940		5.0	2.1	ug/L	1		6020	Dissolved
Total Organic Carbon	4.6		1.0	0.14	mg/L	1		5310C-2000	Total/NA
Sulfate	89		1.0	0.35	mg/L	1		9056A	Total/NA
Dissolved Organic Carbon	4.8		1.0	0.14	mg/L	1		5310 C-2000	Dissolved
DOC Result 1	4.8		1.0	0.14	mg/L	1		5310 C-2000	Dissolved
DOC Result 2	4.8		1.0	0.14	mg/L	1		5310 C-2000	Dissolved

## Client Sample ID: MW-73D\_11072017

## Lab Sample ID: 240-87717-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	2.8		2.0	0.24	ug/L	1		8260B SIM	Total/NA
cis-1,2-Dichloroethene	0.50	J	1.0	0.30	ug/L	1		8260B	Total/NA
Vinyl chloride	1.3		1.0	0.45	ug/L	1		8260B	Total/NA

## Client Sample ID: MW-74\_11072017

## Lab Sample ID: 240-87717-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	1.3	J	2.0	0.24	ug/L	1		8260B SIM	Total/NA
Vinyl chloride	2.4		1.0	0.45	ug/L	1		8260B	Total/NA

## Client Sample ID: MW-85\_11072017

## Lab Sample ID: 240-87717-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	7.3		1.0	0.45	ug/L	1		8260B	Total/NA

## Client Sample ID: DUP-1

## Lab Sample ID: 240-87717-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	3.4		2.0	0.24	ug/L	1		8260B SIM	Total/NA
cis-1,2-Dichloroethene	0.54	J	1.0	0.30	ug/L	1		8260B	Total/NA
Vinyl chloride	1.3		1.0	0.45	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

TestAmerica Job ID: 240-87717-1

**Client Sample ID: MW-72\_11072017**

**Lab Sample ID: 240-87717-1**

**Date Collected: 11/07/17 09:40**

**Matrix: Water**

**Date Received: 11/09/17 09:30**

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.97	J	2.0	0.24	ug/L			11/15/17 16:17	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	85		63 - 125					11/15/17 16:17	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U F2	1.0	0.30	ug/L			11/15/17 14:17	1
1,1-Dichloroethene	1.0	U	1.0	0.27	ug/L			11/15/17 14:17	1
Tetrachloroethene	1.0	U	1.0	0.30	ug/L			11/15/17 14:17	1
trans-1,2-Dichloroethene	1.0	U F2	1.0	0.29	ug/L			11/15/17 14:17	1
Trichloroethene	1.0	U	1.0	0.33	ug/L			11/15/17 14:17	1
Vinyl chloride	1.6		1.0	0.45	ug/L			11/15/17 14:17	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	93		69 - 120					11/15/17 14:17	1
Dibromofluoromethane (Surr)	94		69 - 124					11/15/17 14:17	1
1,2-Dichloroethane-d4 (Surr)	92		61 - 138					11/15/17 14:17	1
Toluene-d8 (Surr)	96		73 - 120					11/15/17 14:17	1

# Client Sample Results

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

TestAmerica Job ID: 240-87717-1

**Client Sample ID: MW-73S\_11072017**

**Lab Sample ID: 240-87717-2**

**Date Collected: 11/07/17 12:00**

**Matrix: Water**

**Date Received: 11/09/17 09:30**

## 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			11/15/17 17:32	1
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
1,2-Dichloroethane-d4 (Surr)	86		63 - 125					11/15/17 17:32	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>cis-1,2-Dichloroethene</b>	<b>1.8</b>		1.0	0.30	ug/L			11/15/17 19:25	1
1,1-Dichloroethene	1.0	U	1.0	0.27	ug/L			11/15/17 19:25	1
Tetrachloroethene	1.0	U	1.0	0.30	ug/L			11/15/17 19:25	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.29	ug/L			11/15/17 19:25	1
<b>Trichloroethene</b>	<b>0.48</b>	<b>J</b>	1.0	0.33	ug/L			11/15/17 19:25	1
<b>Vinyl chloride</b>	<b>1.9</b>		1.0	0.45	ug/L			11/15/17 19:25	1
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
4-Bromofluorobenzene (Surr)	92		69 - 120					11/15/17 19:25	1
Dibromofluoromethane (Surr)	92		69 - 124					11/15/17 19:25	1
1,2-Dichloroethane-d4 (Surr)	91		61 - 138					11/15/17 19:25	1
Toluene-d8 (Surr)	93		73 - 120					11/15/17 19:25	1

## Method: RSK-175 - Dissolved Gases (GC)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Methane</b>	<b>24</b>		1.0	0.17	ug/L			11/17/17 17:36	1
Ethane	1.0	U	1.0	0.10	ug/L			11/17/17 17:36	1
Ethene	1.0	U	1.0	0.11	ug/L			11/17/17 17:36	1
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
1,1,1-Trifluoroethane	82		60 - 140					11/17/17 17:36	1

## Method: 6020 - Metals (ICP/MS) - Total Recoverable

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Iron</b>	<b>1200</b>		100	47	ug/L		11/10/17 14:00	11/13/17 19:35	1
<b>Manganese</b>	<b>890</b>		5.0	2.1	ug/L		11/10/17 14:00	11/13/17 19:35	1

## Method: 6020 - Metals (ICP/MS) - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Iron</b>	<b>1200</b>		100	47	ug/L		11/10/17 14:00	11/13/17 19:49	1
<b>Manganese</b>	<b>940</b>		5.0	2.1	ug/L		11/10/17 14:00	11/13/17 19:49	1

## General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Total Organic Carbon</b>	<b>4.6</b>		1.0	0.14	mg/L			11/13/17 17:22	1
Nitrate as N	0.10	U H	0.10	0.014	mg/L			11/10/17 15:51	1
<b>Sulfate</b>	<b>89</b>		1.0	0.35	mg/L			11/10/17 15:51	1

## General Chemistry - Dissolved

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>Dissolved Organic Carbon</b>	<b>4.8</b>		1.0	0.14	mg/L			11/16/17 09:29	1
<b>DOC Result 1</b>	<b>4.8</b>		1.0	0.14	mg/L			11/16/17 09:29	1
<b>DOC Result 2</b>	<b>4.8</b>		1.0	0.14	mg/L			11/16/17 09:29	1

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# Client Sample Results

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

TestAmerica Job ID: 240-87717-1

**Client Sample ID: MW-73D\_11072017**

**Lab Sample ID: 240-87717-3**

**Date Collected: 11/07/17 13:30**

**Matrix: Water**

**Date Received: 11/09/17 09:30**

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>1,4-Dioxane</b>	<b>2.8</b>		2.0	0.24	ug/L			11/14/17 20:54	1
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
1,2-Dichloroethane-d4 (Surr)	90		63 - 125					11/14/17 20:54	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>cis-1,2-Dichloroethene</b>	<b>0.50</b>	<b>J</b>	1.0	0.30	ug/L			11/15/17 19:47	1
1,1-Dichloroethene	1.0	U	1.0	0.27	ug/L			11/15/17 19:47	1
Tetrachloroethene	1.0	U	1.0	0.30	ug/L			11/15/17 19:47	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.29	ug/L			11/15/17 19:47	1
Trichloroethene	1.0	U	1.0	0.33	ug/L			11/15/17 19:47	1
<b>Vinyl chloride</b>	<b>1.3</b>		1.0	0.45	ug/L			11/15/17 19:47	1
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
4-Bromofluorobenzene (Surr)	93		69 - 120					11/15/17 19:47	1
Dibromofluoromethane (Surr)	95		69 - 124					11/15/17 19:47	1
1,2-Dichloroethane-d4 (Surr)	98		61 - 138					11/15/17 19:47	1
Toluene-d8 (Surr)	96		73 - 120					11/15/17 19:47	1

# Client Sample Results

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

TestAmerica Job ID: 240-87717-1

**Client Sample ID: MW-74\_11072017**

**Lab Sample ID: 240-87717-4**

**Date Collected: 11/07/17 15:10**

**Matrix: Water**

**Date Received: 11/09/17 09:30**

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>1,4-Dioxane</b>	<b>1.3</b>	<b>J</b>	2.0	0.24	ug/L			11/14/17 21:19	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>1,2-Dichloroethane-d4 (Surr)</i>	91		63 - 125					11/14/17 21:19	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.30	ug/L			11/15/17 20:09	1
1,1-Dichloroethene	1.0	U	1.0	0.27	ug/L			11/15/17 20:09	1
Tetrachloroethene	1.0	U	1.0	0.30	ug/L			11/15/17 20:09	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.29	ug/L			11/15/17 20:09	1
Trichloroethene	1.0	U	1.0	0.33	ug/L			11/15/17 20:09	1
<b>Vinyl chloride</b>	<b>2.4</b>		1.0	0.45	ug/L			11/15/17 20:09	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
<i>4-Bromofluorobenzene (Surr)</i>	91		69 - 120					11/15/17 20:09	1
<i>Dibromofluoromethane (Surr)</i>	89		69 - 124					11/15/17 20:09	1
<i>1,2-Dichloroethane-d4 (Surr)</i>	93		61 - 138					11/15/17 20:09	1
<i>Toluene-d8 (Surr)</i>	96		73 - 120					11/15/17 20:09	1

# Client Sample Results

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

TestAmerica Job ID: 240-87717-1

**Client Sample ID: MW-85\_11072017**

**Lab Sample ID: 240-87717-5**

**Date Collected: 11/07/17 16:25**

**Matrix: Water**

**Date Received: 11/09/17 09:30**

**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			11/14/17 21:43	1
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
1,2-Dichloroethane-d4 (Surr)	88		63 - 125					11/14/17 21:43	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.30	ug/L			11/15/17 20:31	1
1,1-Dichloroethene	1.0	U	1.0	0.27	ug/L			11/15/17 20:31	1
Tetrachloroethene	1.0	U	1.0	0.30	ug/L			11/15/17 20:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.29	ug/L			11/15/17 20:31	1
Trichloroethene	1.0	U	1.0	0.33	ug/L			11/15/17 20:31	1
<b>Vinyl chloride</b>	<b>7.3</b>		1.0	0.45	ug/L			11/15/17 20:31	1
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
4-Bromofluorobenzene (Surr)	95		69 - 120					11/15/17 20:31	1
Dibromofluoromethane (Surr)	93		69 - 124					11/15/17 20:31	1
1,2-Dichloroethane-d4 (Surr)	93		61 - 138					11/15/17 20:31	1
Toluene-d8 (Surr)	94		73 - 120					11/15/17 20:31	1

# Client Sample Results

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

TestAmerica Job ID: 240-87717-1

**Client Sample ID: DUP-1**

**Date Collected: 11/07/17 00:00**

**Date Received: 11/09/17 09:30**

**Lab Sample ID: 240-87717-6**

**Matrix: Water**

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>1,4-Dioxane</b>	<b>3.4</b>		2.0	0.24	ug/L			11/14/17 22:08	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	85		63 - 125					11/14/17 22:08	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<b>cis-1,2-Dichloroethene</b>	<b>0.54</b>	<b>J</b>	1.0	0.30	ug/L			11/15/17 20:53	1
1,1-Dichloroethene	1.0	U	1.0	0.27	ug/L			11/15/17 20:53	1
Tetrachloroethene	1.0	U	1.0	0.30	ug/L			11/15/17 20:53	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.29	ug/L			11/15/17 20:53	1
Trichloroethene	1.0	U	1.0	0.33	ug/L			11/15/17 20:53	1
<b>Vinyl chloride</b>	<b>1.3</b>		1.0	0.45	ug/L			11/15/17 20:53	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	94		69 - 120					11/15/17 20:53	1
Dibromofluoromethane (Surr)	93		69 - 124					11/15/17 20:53	1
1,2-Dichloroethane-d4 (Surr)	92		61 - 138					11/15/17 20:53	1
Toluene-d8 (Surr)	94		73 - 120					11/15/17 20:53	1

# Surrogate Summary

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

TestAmerica Job ID: 240-87717-1

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

Matrix: Water

Prep Type: Total/NA

### Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		BFB (69-120)	DBFM (69-124)	12DCE (61-138)	TOL (73-120)
240-87717-1	MW-72_11072017	93	94	92	96
240-87717-1 MS	MW-72_11072017	98	102	103	100
240-87717-1 MSD	MW-72_11072017	94	87	91	98
240-87717-2	MW-73S_11072017	92	92	91	93
240-87717-3	MW-73D_11072017	93	95	98	96
240-87717-4	MW-74_11072017	91	89	93	96
240-87717-5	MW-85_11072017	95	93	93	94
240-87717-6	DUP-1	94	93	92	94
LCS 240-303598/4	Lab Control Sample	94	98	99	99
MB 240-303598/6	Method Blank	94	92	94	94

### Surrogate Legend

BFB = 4-Bromofluorobenzene (Surr)  
DBFM = Dibromofluoromethane (Surr)  
12DCE = 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	12DCE (63-125)
		240-87716-A-5 MS
240-87716-A-5 MSD	Matrix Spike Duplicate	86
240-87717-1	MW-72_11072017	85
240-87717-1 MS	MW-72_11072017	84
240-87717-1 MSD	MW-72_11072017	80
240-87717-2	MW-73S_11072017	86
240-87717-3	MW-73D_11072017	90
240-87717-4	MW-74_11072017	91
240-87717-5	MW-85_11072017	88
240-87717-6	DUP-1	85
LCS 240-303367/4	Lab Control Sample	86
LCS 240-303611/4	Lab Control Sample	84
MB 240-303367/5	Method Blank	86
MB 240-303611/5	Method Blank	80

### Surrogate Legend

12DCE = 1,2-Dichloroethane-d4 (Surr)

## Method: RSK-175 - Dissolved Gases (GC)

Matrix: Water

Prep Type: Total/NA

### Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	Trifluoroet (60-140)
		180-72271-F-7 MSD
180-72271-G-7 MS	Matrix Spike	85
240-87717-2	MW-73S_11072017	82

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# Surrogate Summary

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

TestAmerica Job ID: 240-87717-1

## Method: RSK-175 - Dissolved Gases (GC) (Continued)

Matrix: Water

Prep Type: Total/NA

### Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	Trifluoroethane (60-140)
LCS 240-304058/5	Lab Control Sample	85
LCSD 240-304058/6	Lab Control Sample Dup	86
MB 240-304058/4	Method Blank	89

#### Surrogate Legend

1,1,1-Trifluoroethane = 1,1,1-Trifluoroethane

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



# QC Sample Results

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

TestAmerica Job ID: 240-87717-1

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

**Lab Sample ID: MB 240-303598/6**

**Matrix: Water**

**Analysis Batch: 303598**

**Client Sample ID: Method Blank**

**Prep Type: Total/NA**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
cis-1,2-Dichloroethene	1.0	U	1.0	0.30	ug/L			11/15/17 13:41	1
1,1-Dichloroethene	1.0	U	1.0	0.27	ug/L			11/15/17 13:41	1
Tetrachloroethene	1.0	U	1.0	0.30	ug/L			11/15/17 13:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.29	ug/L			11/15/17 13:41	1
Trichloroethene	1.0	U	1.0	0.33	ug/L			11/15/17 13:41	1
Vinyl chloride	1.0	U	1.0	0.45	ug/L			11/15/17 13:41	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene (Surr)	94		69 - 120		11/15/17 13:41	1
Dibromofluoromethane (Surr)	92		69 - 124		11/15/17 13:41	1
1,2-Dichloroethane-d4 (Surr)	94		61 - 138		11/15/17 13:41	1
Toluene-d8 (Surr)	94		73 - 120		11/15/17 13:41	1

**Lab Sample ID: LCS 240-303598/4**

**Matrix: Water**

**Analysis Batch: 303598**

**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	16.8		ug/L		84	35 - 131
Benzene	10.0	9.50		ug/L		95	79 - 120
Bromodichloromethane	10.0	8.86		ug/L		89	79 - 125
Bromoform	10.0	9.14		ug/L		91	55 - 145
Bromomethane	10.0	4.33		ug/L		43	17 - 158
2-Butanone (MEK)	20.0	26.6		ug/L		133	43 - 149
Carbon disulfide	10.0	7.91		ug/L		79	49 - 141
Carbon tetrachloride	10.0	8.57		ug/L		86	55 - 171
Chlorobenzene	10.0	9.17		ug/L		92	80 - 120
Chloroethane	10.0	3.37		ug/L		34	10 - 149
Chloroform	10.0	8.51		ug/L		85	80 - 120
Chloromethane	10.0	8.16		ug/L		82	59 - 124
cis-1,2-Dichloroethene	10.0	8.75		ug/L		87	77 - 120
cis-1,3-Dichloropropene	10.0	11.0		ug/L		110	75 - 120
Cyclohexane	10.0	9.96		ug/L		100	66 - 135
Dibromochloromethane	10.0	8.62		ug/L		86	64 - 129
1,2-Dibromo-3-Chloropropane	10.0	9.00		ug/L		90	50 - 130
1,2-Dibromoethane	10.0	9.69		ug/L		97	80 - 120
1,2-Dichlorobenzene	10.0	7.99		ug/L		80	80 - 120
1,3-Dichlorobenzene	10.0	8.58		ug/L		86	80 - 120
1,4-Dichlorobenzene	10.0	8.39		ug/L		84	80 - 120
Dichlorodifluoromethane	10.0	12.3		ug/L		123	42 - 141
1,1-Dichloroethane	10.0	9.01		ug/L		90	74 - 120
1,2-Dichloroethane	10.0	9.39		ug/L		94	68 - 133
1,1-Dichloroethene	10.0	9.18		ug/L		92	65 - 127
1,2-Dichloropropane	10.0	10.3		ug/L		103	78 - 127
Diethyl ether	10.0	9.54		ug/L		95	72 - 125
Ethylbenzene	10.0	8.92		ug/L		89	80 - 120
2-Hexanone	20.0	23.3		ug/L		117	28 - 169
Isopropylbenzene	10.0	8.27		ug/L		83	80 - 128

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# QC Sample Results

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

TestAmerica Job ID: 240-87717-1

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

**Lab Sample ID: LCS 240-303598/4**  
**Matrix: Water**  
**Analysis Batch: 303598**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Methyl acetate	20.0	18.7		ug/L		93	63 - 137
Methylcyclohexane	10.0	9.82		ug/L		98	63 - 141
Methylene Chloride	10.0	7.56		ug/L		76	64 - 140
4-Methyl-2-pentanone (MIBK)	20.0	22.3		ug/L		111	53 - 144
Methyl tert-butyl ether	10.0	8.85		ug/L		88	73 - 120
Styrene	10.0	8.54		ug/L		85	80 - 121
1,1,2,2-Tetrachloroethane	10.0	9.75		ug/L		97	58 - 122
Tetrachloroethene	10.0	9.45		ug/L		94	80 - 122
Toluene	10.0	8.77		ug/L		88	78 - 120
trans-1,2-Dichloroethene	10.0	9.10		ug/L		91	74 - 124
trans-1,3-Dichloropropene	10.0	8.84		ug/L		88	67 - 120
1,2,4-Trichlorobenzene	10.0	6.90		ug/L		69	34 - 141
1,1,1-Trichloroethane	10.0	8.27		ug/L		83	64 - 147
1,1,2-Trichloroethane	10.0	9.67		ug/L		97	76 - 121
Trichloroethene	10.0	9.64		ug/L		96	76 - 124
Trichlorofluoromethane	10.0	8.16		ug/L		82	27 - 176
1,1,2-Trichloro-1,2,2-trifluoroethane	10.0	11.0		ug/L		110	65 - 144
1,2,4-Trimethylbenzene	10.0	8.35		ug/L		84	80 - 120
1,3,5-Trimethylbenzene	10.0	8.62		ug/L		86	79 - 120
Vinyl chloride	10.0	9.69		ug/L		97	65 - 124
Xylenes, Total	20.0	17.1		ug/L		85	80 - 120
1,4-Dioxane	200	172		ug/L		86	35 - 134

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene (Surr)	94		69 - 120
Dibromofluoromethane (Surr)	98		69 - 124
1,2-Dichloroethane-d4 (Surr)	99		61 - 138
Toluene-d8 (Surr)	99		73 - 120

**Lab Sample ID: 240-87717-1 MS**  
**Matrix: Water**  
**Analysis Batch: 303598**

**Client Sample ID: MW-72\_11072017**  
**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	13.0		ug/L		65	19 - 133
Benzene	1.0	U F2	10.0	9.56		ug/L		96	69 - 127
Bromodichloromethane	1.0	U	10.0	8.59		ug/L		86	75 - 128
Bromoform	1.0	U	10.0	8.65		ug/L		86	61 - 135
Bromomethane	1.0	U	10.0	2.44		ug/L		24	10 - 148
2-Butanone (MEK)	10	U	20.0	17.8		ug/L		89	34 - 153
Carbon disulfide	5.0	U F2	10.0	11.2		ug/L		112	46 - 143
Carbon tetrachloride	1.0	U	10.0	9.65		ug/L		96	53 - 175
Chlorobenzene	1.0	U	10.0	9.22		ug/L		92	76 - 120
Chloroethane	1.0	U F2	10.0	5.40		ug/L		54	10 - 141
Chloroform	1.0	U F2	10.0	9.31		ug/L		93	74 - 125
Chloromethane	1.0	U F1	10.0	3.12	F1	ug/L		31	34 - 127
cis-1,2-Dichloroethene	1.0	U F2	10.0	9.11		ug/L		91	69 - 127

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# QC Sample Results

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

TestAmerica Job ID: 240-87717-1

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

Lab Sample ID: 240-87717-1 MS

Matrix: Water

Analysis Batch: 303598

Client Sample ID: MW-72\_11072017

Prep Type: Total/NA

Analyte	Sample	Sample	Spike	MS	MS	Unit	D	%Rec	%Rec. Limits
	Result	Qualifier	Added	Result	Qualifier				
cis-1,3-Dichloropropene	1.0	U	10.0	9.98		ug/L		100	68 - 120
Cyclohexane	1.0	U	10.0	11.2		ug/L		112	56 - 135
Dibromochloromethane	1.0	U	10.0	8.47		ug/L		85	62 - 131
1,2-Dibromo-3-Chloropropane	1.0	U	10.0	7.40		ug/L		74	48 - 130
1,2-Dibromoethane	1.0	U	10.0	9.15		ug/L		91	73 - 121
1,2-Dichlorobenzene	1.0	U	10.0	8.32		ug/L		83	70 - 120
1,3-Dichlorobenzene	1.0	U	10.0	8.66		ug/L		87	71 - 120
1,4-Dichlorobenzene	1.0	U	10.0	8.92		ug/L		89	72 - 120
Dichlorodifluoromethane	1.0	U	10.0	12.6		ug/L		126	45 - 130
1,1-Dichloroethane	1.0	U F2	10.0	9.59		ug/L		96	69 - 122
1,2-Dichloroethane	1.0	U	10.0	9.21		ug/L		92	64 - 138
1,1-Dichloroethene	1.0	U	10.0	9.91		ug/L		99	62 - 127
1,2-Dichloropropane	1.0	U	10.0	10.1		ug/L		101	72 - 131
Diethyl ether	2.0	U F2	10.0	9.41		ug/L		94	65 - 124
Ethylbenzene	1.0	U	10.0	9.02		ug/L		90	72 - 121
2-Hexanone	10	U	20.0	20.5		ug/L		103	21 - 184
Isopropylbenzene	1.0	U	10.0	8.52		ug/L		85	70 - 132
Methyl acetate	10	U	20.0	16.3		ug/L		81	52 - 139
Methylcyclohexane	1.0	U	10.0	10.6		ug/L		106	46 - 139
Methylene Chloride	5.0	U F2	10.0	8.92		ug/L		89	52 - 137
4-Methyl-2-pentanone (MIBK)	10	U	20.0	19.7		ug/L		98	53 - 147
Methyl tert-butyl ether	1.0	U F2	10.0	9.00		ug/L		90	67 - 125
Styrene	1.0	U	10.0	8.73		ug/L		87	74 - 125
1,1,2,2-Tetrachloroethane	1.0	U	10.0	8.80		ug/L		88	51 - 123
Tetrachloroethene	1.0	U	10.0	10.2		ug/L		102	69 - 126
Toluene	1.0	U	10.0	8.93		ug/L		89	69 - 125
trans-1,2-Dichloroethene	1.0	U F2	10.0	9.69		ug/L		97	66 - 131
trans-1,3-Dichloropropene	1.0	U	10.0	8.37		ug/L		84	59 - 120
1,2,4-Trichlorobenzene	1.0	U	10.0	6.69		ug/L		67	26 - 138
1,1,1-Trichloroethane	1.0	U F2	10.0	9.56		ug/L		96	57 - 156
1,1,2-Trichloroethane	1.0	U	10.0	9.52		ug/L		95	68 - 127
Trichloroethene	1.0	U	10.0	9.93		ug/L		99	68 - 129
Trichlorofluoromethane	1.0	U F2	10.0	9.52		ug/L		95	28 - 172
1,1,2-Trichloro-1,2,2-trifluoroethane	1.0	U	10.0	11.6		ug/L		116	58 - 137
1,2,4-Trimethylbenzene	1.0	U	10.0	8.58		ug/L		86	64 - 120
1,3,5-Trimethylbenzene	1.0	U	10.0	8.70		ug/L		87	67 - 120
Vinyl chloride	1.6		10.0	13.2		ug/L		115	55 - 123
Xylenes, Total	2.0	U	20.0	17.3		ug/L		86	71 - 122
1,4-Dioxane	50	U	200	110		ug/L		55	13 - 155

Surrogate	MS	MS	Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene (Surr)	98		69 - 120
Dibromofluoromethane (Surr)	102		69 - 124
1,2-Dichloroethane-d4 (Surr)	103		61 - 138
Toluene-d8 (Surr)	100		73 - 120

TestAmerica Canton

# QC Sample Results

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

TestAmerica Job ID: 240-87717-1

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

**Lab Sample ID: 240-87717-1 MSD**

**Matrix: Water**

**Analysis Batch: 303598**

**Client Sample ID: MW-72\_11072017**

**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	13.2		ug/L		66	19 - 133	2	35
Benzene	1.0	U F2	10.0	8.25	F2	ug/L		82	69 - 127	15	10
Bromodichloromethane	1.0	U	10.0	7.68		ug/L		77	75 - 128	11	13
Bromoform	1.0	U	10.0	8.46		ug/L		85	61 - 135	2	13
Bromomethane	1.0	U	10.0	2.27		ug/L		23	10 - 148	7	35
2-Butanone (MEK)	10	U	20.0	18.5		ug/L		93	34 - 153	4	23
Carbon disulfide	5.0	U F2	10.0	7.88	F2	ug/L		79	46 - 143	35	18
Carbon tetrachloride	1.0	U	10.0	8.30		ug/L		83	53 - 175	15	17
Chlorobenzene	1.0	U	10.0	9.13		ug/L		91	76 - 120	1	12
Chloroethane	1.0	U F2	10.0	2.72	F2	ug/L		27	10 - 141	66	35
Chloroform	1.0	U F2	10.0	7.83	F2	ug/L		78	74 - 125	17	11
Chloromethane	1.0	U F1	10.0	2.69	F1	ug/L		27	34 - 127	15	25
cis-1,2-Dichloroethene	1.0	U F2	10.0	7.71	F2	ug/L		77	69 - 127	17	11
cis-1,3-Dichloropropene	1.0	U	10.0	9.57		ug/L		96	68 - 120	4	13
Cyclohexane	1.0	U	10.0	10.1		ug/L		101	56 - 135	10	35
Dibromochloromethane	1.0	U	10.0	8.30		ug/L		83	62 - 131	2	15
1,2-Dibromo-3-Chloropropane	1.0	U	10.0	7.48		ug/L		75	48 - 130	1	31
1,2-Dibromoethane	1.0	U	10.0	9.40		ug/L		94	73 - 121	3	12
1,2-Dichlorobenzene	1.0	U	10.0	8.07		ug/L		81	70 - 120	3	19
1,3-Dichlorobenzene	1.0	U	10.0	8.61		ug/L		86	71 - 120	1	18
1,4-Dichlorobenzene	1.0	U	10.0	8.64		ug/L		86	72 - 120	3	17
Dichlorodifluoromethane	1.0	U	10.0	12.0		ug/L		120	45 - 130	5	34
1,1-Dichloroethane	1.0	U F2	10.0	8.06	F2	ug/L		81	69 - 122	17	11
1,2-Dichloroethane	1.0	U	10.0	8.25		ug/L		83	64 - 138	11	11
1,1-Dichloroethene	1.0	U	10.0	8.60		ug/L		86	62 - 127	14	14
1,2-Dichloropropane	1.0	U	10.0	9.00		ug/L		90	72 - 131	12	12
Diethyl ether	2.0	U F2	10.0	8.06	F2	ug/L		81	65 - 124	16	11
Ethylbenzene	1.0	U	10.0	8.86		ug/L		89	72 - 121	2	15
2-Hexanone	10	U	20.0	21.8		ug/L		109	21 - 184	6	12
Isopropylbenzene	1.0	U	10.0	8.52		ug/L		85	70 - 132	0	16
Methyl acetate	10	U	20.0	15.0		ug/L		75	52 - 139	8	14
Methylcyclohexane	1.0	U	10.0	10.0		ug/L		100	46 - 139	5	35
Methylene Chloride	5.0	U F2	10.0	6.93	F2	ug/L		69	52 - 137	25	12
4-Methyl-2-pentanone (MIBK)	10	U	20.0	18.2		ug/L		91	53 - 147	8	16
Methyl tert-butyl ether	1.0	U F2	10.0	7.66	F2	ug/L		77	67 - 125	16	12
Styrene	1.0	U	10.0	8.56		ug/L		86	74 - 125	2	14
1,1,2,2-Tetrachloroethane	1.0	U	10.0	8.48		ug/L		85	51 - 123	4	17
Tetrachloroethene	1.0	U	10.0	10.0		ug/L		100	69 - 126	2	18
Toluene	1.0	U	10.0	8.96		ug/L		90	69 - 125	0	14
trans-1,2-Dichloroethene	1.0	U F2	10.0	8.12	F2	ug/L		81	66 - 131	18	11
trans-1,3-Dichloropropene	1.0	U	10.0	8.55		ug/L		86	59 - 120	2	14
1,2,4-Trichlorobenzene	1.0	U	10.0	7.45		ug/L		74	26 - 138	11	35
1,1,1-Trichloroethane	1.0	U F2	10.0	7.77	F2	ug/L		78	57 - 156	21	13
1,1,2-Trichloroethane	1.0	U	10.0	9.12		ug/L		91	68 - 127	4	11
Trichloroethene	1.0	U	10.0	8.93		ug/L		89	68 - 129	11	12
Trichlorofluoromethane	1.0	U F2	10.0	7.03	F2	ug/L		70	28 - 172	30	26
1,1,2-Trichloro-1,2,2-trifluoroethane	1.0	U	10.0	10.6		ug/L		106	58 - 137	9	35

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# QC Sample Results

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

TestAmerica Job ID: 240-87717-1

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

**Lab Sample ID: 240-87717-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 303598**

**Client Sample ID: MW-72\_11072017**  
**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	8.41		ug/L		84	64 - 120	2	22
1,3,5-Trimethylbenzene	1.0	U	10.0	8.65		ug/L		87	67 - 120	1	25
Vinyl chloride	1.6		10.0	11.7		ug/L		100	55 - 123	12	12
Xylenes, Total	2.0	U	20.0	17.2		ug/L		86	71 - 122	1	14
1,4-Dioxane	50	U	200	145		ug/L		72	13 - 155	28	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
4-Bromofluorobenzene (Surr)	94		69 - 120
Dibromofluoromethane (Surr)	87		69 - 124
1,2-Dichloroethane-d4 (Surr)	91		61 - 138
Toluene-d8 (Surr)	98		73 - 120

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

**Lab Sample ID: MB 240-303367/5**  
**Matrix: Water**  
**Analysis Batch: 303367**

**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			11/14/17 12:37	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	86		63 - 125		11/14/17 12:37	1

**Lab Sample ID: LCS 240-303367/4**  
**Matrix: Water**  
**Analysis Batch: 303367**

**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	9.86		ug/L		99	59 - 131

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	86		63 - 125

**Lab Sample ID: 240-87716-A-5 MS**  
**Matrix: Water**  
**Analysis Batch: 303367**

**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	49		10.0	59.6	4	ug/L		107	52 - 129

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	84		63 - 125

TestAmerica Canton

# QC Sample Results

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

TestAmerica Job ID: 240-87717-1

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

**Lab Sample ID: 240-87716-A-5 MSD**  
**Matrix: Water**  
**Analysis Batch: 303367**

**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	49		10.0	58.3	4	ug/L		94	52 - 129	2	13
<b>Surrogate</b>	<b>%Recovery</b>	<b>MSD Qualifier</b>	<b>Limits</b>								
1,2-Dichloroethane-d4 (Surr)	86		63 - 125								

**Lab Sample ID: MB 240-303611/5**  
**Matrix: Water**  
**Analysis Batch: 303611**

**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			11/15/17 14:13	1	
<b>Surrogate</b>	<b>%Recovery</b>	<b>MB Qualifier</b>	<b>Limits</b>	<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>				
1,2-Dichloroethane-d4 (Surr)	80		63 - 125		11/15/17 14:13	1				

**Lab Sample ID: LCS 240-303611/4**  
**Matrix: Water**  
**Analysis Batch: 303611**

**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	9.45		ug/L		94	59 - 131
<b>Surrogate</b>	<b>%Recovery</b>	<b>LCS Qualifier</b>	<b>Limits</b>				
1,2-Dichloroethane-d4 (Surr)	84		63 - 125				

**Lab Sample ID: 240-87717-1 MS**  
**Matrix: Water**  
**Analysis Batch: 303611**

**Client Sample ID: MW-72\_11072017**  
**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	0.97	J	10.0	10.3		ug/L		93	52 - 129
<b>Surrogate</b>	<b>%Recovery</b>	<b>MS Qualifier</b>	<b>Limits</b>						
1,2-Dichloroethane-d4 (Surr)	84		63 - 125						

**Lab Sample ID: 240-87717-1 MSD**  
**Matrix: Water**  
**Analysis Batch: 303611**

**Client Sample ID: MW-72\_11072017**  
**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	0.97	J	10.0	10.9		ug/L		100	52 - 129	6	13
<b>Surrogate</b>	<b>%Recovery</b>	<b>MSD Qualifier</b>	<b>Limits</b>								
1,2-Dichloroethane-d4 (Surr)	80		63 - 125								

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# QC Sample Results

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

TestAmerica Job ID: 240-87717-1

## Method: RSK-175 - Dissolved Gases (GC)

**Lab Sample ID: MB 240-304058/4**  
**Matrix: Water**  
**Analysis Batch: 304058**

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

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Methane	1.0	U	1.0	0.17	ug/L			11/17/17 14:45	1
Ethane	1.0	U	1.0	0.10	ug/L			11/17/17 14:45	1
Ethene	1.0	U	1.0	0.11	ug/L			11/17/17 14:45	1
Surrogate	MB MB		Limits			D	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier							
1,1,1-Trifluoroethane	89		60 - 140					11/17/17 14:45	1

**Lab Sample ID: LCS 240-304058/5**  
**Matrix: Water**  
**Analysis Batch: 304058**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
								RPD	Limit
Methane	285	275		ug/L		96	80 - 120		
Ethane	536	583		ug/L		109	80 - 120		
Ethene	501	536		ug/L		107	80 - 120		
Surrogate	LCS LCS		Limits			D	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier							
1,1,1-Trifluoroethane	85		60 - 140						

**Lab Sample ID: LCSD 240-304058/6**  
**Matrix: Water**  
**Analysis Batch: 304058**

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	Limit
Ethane	536	593		ug/L		110	80 - 120	2	35
Ethene	501	544		ug/L		109	80 - 120	2	35
Surrogate	LCSD LCSD		Limits			D	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier							
1,1,1-Trifluoroethane	86		60 - 140						

**Lab Sample ID: 180-72271-F-7 MSD**  
**Matrix: Water**  
**Analysis Batch: 304058**

**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	Limit
Ethane	0.43	J	536	579		ug/L		108	50 - 150	2	30
Ethene	3.7		501	538		ug/L		107	50 - 150	1	30
Surrogate	MSD MSD		Limits			D	Prepared	Analyzed	Dil Fac		
	%Recovery	Qualifier									
1,1,1-Trifluoroethane	84		60 - 140								

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# QC Sample Results

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

TestAmerica Job ID: 240-87717-1

## Method: RSK-175 - Dissolved Gases (GC) (Continued)

**Lab Sample ID: 180-72271-G-7 MS**

**Matrix: Water**

**Analysis Batch: 304058**

**Client Sample ID: Matrix Spike**

**Prep Type: Total/NA**

Analyte	Sample	Sample	Spike	MS MS		Unit	D	%Rec	%Rec.
	Result	Qualifier		Result	Qualifier				
Methane	46		285	346		ug/L		105	50 - 150
Ethane	0.43	J	536	588		ug/L		110	50 - 150
Ethene	3.7		501	546		ug/L		108	50 - 150
		<b>MS MS</b>							
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>						
1,1,1-Trifluoroethane	85		60 - 140						

## Method: 6020 - Metals (ICP/MS)

**Lab Sample ID: MB 240-302998/1-A**

**Matrix: Water**

**Analysis Batch: 303332**

**Client Sample ID: Method Blank**

**Prep Type: Total Recoverable**

**Prep Batch: 302998**

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
Iron	100	U	100	47	ug/L		11/10/17 14:00	11/13/17 17:52	1
Manganese	5.0	U	5.0	2.1	ug/L		11/10/17 14:00	11/13/17 17:52	1

**Lab Sample ID: LCS 240-302998/2-A**

**Matrix: Water**

**Analysis Batch: 303332**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total Recoverable**

**Prep Batch: 302998**

Analyte	Spike	LCS LCS		Unit	D	%Rec	%Rec.
		Result	Qualifier				
Iron	10000	9490		ug/L		95	80 - 120
Manganese	1000	978		ug/L		98	80 - 120

**Lab Sample ID: LCSD 240-302998/21-A**

**Matrix: Water**

**Analysis Batch: 303332**

**Client Sample ID: Lab Control Sample Dup**

**Prep Type: Total Recoverable**

**Prep Batch: 302998**

Analyte	Spike	LCSD LCSD		Unit	D	%Rec	%Rec.	RPD
		Result	Qualifier					
Iron	10000	9900		ug/L		99	80 - 120	4 20
Manganese	1000	1020		ug/L		102	80 - 120	4 20

**Lab Sample ID: 240-87767-F-4-B MS**

**Matrix: Water**

**Analysis Batch: 303332**

**Client Sample ID: Matrix Spike**

**Prep Type: Total Recoverable**

**Prep Batch: 302998**

Analyte	Sample	Sample	Spike	MS MS		Unit	D	%Rec	%Rec.
	Result	Qualifier		Result	Qualifier				
Iron	4700		10000	14200		ug/L		95	75 - 125
Manganese	250		1000	1220		ug/L		97	75 - 125

**Lab Sample ID: 240-87767-F-4-C MSD**

**Matrix: Water**

**Analysis Batch: 303332**

**Client Sample ID: Matrix Spike Duplicate**

**Prep Type: Total Recoverable**

**Prep Batch: 302998**

Analyte	Sample	Sample	Spike	MSD MSD		Unit	D	%Rec	%Rec.	RPD
	Result	Qualifier		Result	Qualifier					
Iron	4700		10000	14400		ug/L		97	75 - 125	2 20
Manganese	250		1000	1240		ug/L		99	75 - 125	1 20

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# QC Sample Results

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

TestAmerica Job ID: 240-87717-1

## Method: 5310 C-2000 - Organic Carbon, Dissolved (DOC)

**Lab Sample ID: MB 240-303877/4**  
**Matrix: Water**  
**Analysis Batch: 303877**

**Client Sample ID: Method Blank**  
**Prep Type: Dissolved**

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Dissolved Organic Carbon	1.0	U	1.0	0.14	mg/L			11/16/17 08:43	1
DOC Result 1	1.0	U	1.0	0.14	mg/L			11/16/17 08:43	1
DOC Result 2	1.0	U	1.0	0.14	mg/L			11/16/17 08:43	1

**Lab Sample ID: LCS 240-303877/6**  
**Matrix: Water**  
**Analysis Batch: 303877**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Dissolved**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dissolved Organic Carbon	21.8	21.9		mg/L		100	80 - 120
DOC Result 1	21.8	21.9		mg/L		101	80 - 120
DOC Result 2	21.8	21.8		mg/L		100	80 - 120

**Lab Sample ID: LLCS 240-303877/5**  
**Matrix: Water**  
**Analysis Batch: 303877**

**Client Sample ID: Lab Control Sample**  
**Prep Type: Dissolved**

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Dissolved Organic Carbon	2.18	2.30		mg/L		106	88 - 115
DOC Result 1	2.18	2.31		mg/L		106	88 - 115
DOC Result 2	2.18	2.29		mg/L		105	88 - 115

**Lab Sample ID: 240-87717-2 MS**  
**Matrix: Water**  
**Analysis Batch: 303877**

**Client Sample ID: MW-73S\_11072017**  
**Prep Type: Dissolved**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Dissolved Organic Carbon	4.8		25.0	33.0		mg/L		113	65 - 134
DOC Result 1	4.8		25.0	32.8		mg/L		112	65 - 134
DOC Result 2	4.8		25.0	33.2		mg/L		114	65 - 134

**Lab Sample ID: 240-87717-2 MSD**  
**Matrix: Water**  
**Analysis Batch: 303877**

**Client Sample ID: MW-73S\_11072017**  
**Prep Type: Dissolved**

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Dissolved Organic Carbon	4.8		25.0	33.2		mg/L		114	65 - 134	1	10
DOC Result 1	4.8		25.0	33.3		mg/L		114	65 - 134	2	10
DOC Result 2	4.8		25.0	33.0		mg/L		113	65 - 134	0	10

## Method: 5310C-2000 - Total Organic Carbon/Persulfate - Ultrav

**Lab Sample ID: MB 240-303314/4**  
**Matrix: Water**  
**Analysis Batch: 303314**

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Organic Carbon	1.0	U	1.0	0.14	mg/L			11/13/17 13:31	1

TestAmerica Canton

# QC Sample Results

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

TestAmerica Job ID: 240-87717-1

## Method: 5310C-2000 - Total Organic Carbon/Persulfate - Ultrav (Continued)

**Lab Sample ID:** LCS 240-303314/6  
**Matrix:** Water  
**Analysis Batch:** 303314

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	21.8	21.6		mg/L		99	80 - 120

**Lab Sample ID:** LLCS 240-303314/5  
**Matrix:** Water  
**Analysis Batch:** 303314

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

Analyte	Spike Added	LLCS Result	LLCS Qualifier	Unit	D	%Rec	%Rec. Limits
Total Organic Carbon	2.18	2.27		mg/L		104	88 - 115

**Lab Sample ID:** 240-87847-E-4 MS  
**Matrix:** Water  
**Analysis Batch:** 303314

**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
Total Organic Carbon	0.65	J	25.0	26.0		mg/L		101	65 - 134

**Lab Sample ID:** 240-87847-E-4 MSD  
**Matrix:** Water  
**Analysis Batch:** 303314

**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
Total Organic Carbon	0.65	J	25.0	26.0		mg/L		101	65 - 134	0	10

## Method: 9056A - Anions, Ion Chromatography

**Lab Sample ID:** MB 240-302920/3  
**Matrix:** Water  
**Analysis Batch:** 302920

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Sulfate	1.0	U	1.0	0.35	mg/L			11/10/17 12:03	1

**Lab Sample ID:** LCS 240-302920/4  
**Matrix:** Water  
**Analysis Batch:** 302920

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Sulfate	50.0	53.3		mg/L		107	90 - 110

**Lab Sample ID:** MB 240-302921/3  
**Matrix:** Water  
**Analysis Batch:** 302921

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Nitrate as N	0.10	U	0.10	0.014	mg/L			11/10/17 12:03	1

TestAmerica Canton

# QC Sample Results

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

TestAmerica Job ID: 240-87717-1

## Method: 9056A - Anions, Ion Chromatography (Continued)

**Lab Sample ID: LCS 240-302921/4**  
**Matrix: Water**  
**Analysis Batch: 302921**

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Nitrate as N	2.50	2.70		mg/L		108	90 - 110

**Lab Sample ID: 240-87690-K-2 MS**  
**Matrix: Water**  
**Analysis Batch: 302921**

**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
Nitrate as N	0.10	U	2.50	2.69		mg/L		108	80 - 120

**Lab Sample ID: 240-87690-K-2 MSD**  
**Matrix: Water**  
**Analysis Batch: 302921**

**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
Nitrate as N	0.10	U	2.50	2.67		mg/L		107	80 - 120	1	15

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# QC Association Summary

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

TestAmerica Job ID: 240-87717-1

## GC/MS VOA

### Analysis Batch: 303367

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-87717-3	MW-73D_11072017	Total/NA	Water	8260B SIM	
240-87717-4	MW-74_11072017	Total/NA	Water	8260B SIM	
240-87717-5	MW-85_11072017	Total/NA	Water	8260B SIM	
240-87717-6	DUP-1	Total/NA	Water	8260B SIM	
MB 240-303367/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-303367/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-87716-A-5 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-87716-A-5 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

### Analysis Batch: 303598

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-87717-1	MW-72_11072017	Total/NA	Water	8260B	
240-87717-2	MW-73S_11072017	Total/NA	Water	8260B	
240-87717-3	MW-73D_11072017	Total/NA	Water	8260B	
240-87717-4	MW-74_11072017	Total/NA	Water	8260B	
240-87717-5	MW-85_11072017	Total/NA	Water	8260B	
240-87717-6	DUP-1	Total/NA	Water	8260B	
MB 240-303598/6	Method Blank	Total/NA	Water	8260B	
LCS 240-303598/4	Lab Control Sample	Total/NA	Water	8260B	
240-87717-1 MS	MW-72_11072017	Total/NA	Water	8260B	
240-87717-1 MSD	MW-72_11072017	Total/NA	Water	8260B	

### Analysis Batch: 303611

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-87717-1	MW-72_11072017	Total/NA	Water	8260B SIM	
240-87717-2	MW-73S_11072017	Total/NA	Water	8260B SIM	
MB 240-303611/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-303611/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-87717-1 MS	MW-72_11072017	Total/NA	Water	8260B SIM	
240-87717-1 MSD	MW-72_11072017	Total/NA	Water	8260B SIM	

## GC VOA

### Analysis Batch: 304058

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-87717-2	MW-73S_11072017	Total/NA	Water	RSK-175	
MB 240-304058/4	Method Blank	Total/NA	Water	RSK-175	
LCS 240-304058/5	Lab Control Sample	Total/NA	Water	RSK-175	
LCSD 240-304058/6	Lab Control Sample Dup	Total/NA	Water	RSK-175	
180-72271-F-7 MSD	Matrix Spike Duplicate	Total/NA	Water	RSK-175	
180-72271-G-7 MS	Matrix Spike	Total/NA	Water	RSK-175	

## Metals

### Prep Batch: 302998

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-87717-2	MW-73S_11072017	Dissolved	Water	3005A	
240-87717-2	MW-73S_11072017	Total Recoverable	Water	3005A	
MB 240-302998/1-A	Method Blank	Total Recoverable	Water	3005A	
LCS 240-302998/2-A	Lab Control Sample	Total Recoverable	Water	3005A	

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# QC Association Summary

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

TestAmerica Job ID: 240-87717-1

## Metals (Continued)

### Prep Batch: 302998 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS D 240-302998/21-A	Lab Control Sample Dup	Total Recoverable	Water	3005A	
240-87767-F-4-B MS	Matrix Spike	Total Recoverable	Water	3005A	
240-87767-F-4-C MSD	Matrix Spike Duplicate	Total Recoverable	Water	3005A	

### Analysis Batch: 303332

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-87717-2	MW-73S_11072017	Dissolved	Water	6020	302998
240-87717-2	MW-73S_11072017	Total Recoverable	Water	6020	302998
MB 240-302998/1-A	Method Blank	Total Recoverable	Water	6020	302998
LCS 240-302998/2-A	Lab Control Sample	Total Recoverable	Water	6020	302998
LCS D 240-302998/21-A	Lab Control Sample Dup	Total Recoverable	Water	6020	302998
240-87767-F-4-B MS	Matrix Spike	Total Recoverable	Water	6020	302998
240-87767-F-4-C MSD	Matrix Spike Duplicate	Total Recoverable	Water	6020	302998

## General Chemistry

### Analysis Batch: 302920

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-87717-2	MW-73S_11072017	Total/NA	Water	9056A	
MB 240-302920/3	Method Blank	Total/NA	Water	9056A	
LCS 240-302920/4	Lab Control Sample	Total/NA	Water	9056A	

### Analysis Batch: 302921

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-87717-2	MW-73S_11072017	Total/NA	Water	9056A	
MB 240-302921/3	Method Blank	Total/NA	Water	9056A	
LCS 240-302921/4	Lab Control Sample	Total/NA	Water	9056A	
240-87690-K-2 MS	Matrix Spike	Total/NA	Water	9056A	
240-87690-K-2 MSD	Matrix Spike Duplicate	Total/NA	Water	9056A	

### Analysis Batch: 303314

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-87717-2	MW-73S_11072017	Total/NA	Water	5310C-2000	
MB 240-303314/4	Method Blank	Total/NA	Water	5310C-2000	
LCS 240-303314/6	Lab Control Sample	Total/NA	Water	5310C-2000	
LLCS 240-303314/5	Lab Control Sample	Total/NA	Water	5310C-2000	
240-87847-E-4 MS	Matrix Spike	Total/NA	Water	5310C-2000	
240-87847-E-4 MSD	Matrix Spike Duplicate	Total/NA	Water	5310C-2000	

### Analysis Batch: 303877

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-87717-2	MW-73S_11072017	Dissolved	Water	5310 C-2000	
MB 240-303877/4	Method Blank	Dissolved	Water	5310 C-2000	
LCS 240-303877/6	Lab Control Sample	Dissolved	Water	5310 C-2000	
LLCS 240-303877/5	Lab Control Sample	Dissolved	Water	5310 C-2000	
240-87717-2 MS	MW-73S_11072017	Dissolved	Water	5310 C-2000	
240-87717-2 MSD	MW-73S_11072017	Dissolved	Water	5310 C-2000	

TestAmerica Canton

# Lab Chronicle

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

TestAmerica Job ID: 240-87717-1

**Client Sample ID: MW-72\_11072017**

**Lab Sample ID: 240-87717-1**

**Date Collected: 11/07/17 09:40**

**Matrix: Water**

**Date Received: 11/09/17 09:30**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	303598	11/15/17 14:17	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	303611	11/15/17 16:17	SAM	TAL CAN

**Client Sample ID: MW-73S\_11072017**

**Lab Sample ID: 240-87717-2**

**Date Collected: 11/07/17 12:00**

**Matrix: Water**

**Date Received: 11/09/17 09:30**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	303598	11/15/17 19:25	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	303611	11/15/17 17:32	SAM	TAL CAN
Total/NA	Analysis	RSK-175		1	304058	11/17/17 17:36	BPM	TAL CAN
Dissolved	Prep	3005A			302998	11/10/17 14:00	AJC	TAL CAN
Dissolved	Analysis	6020		1	303332	11/13/17 19:49	RKT	TAL CAN
Total Recoverable	Prep	3005A			302998	11/10/17 14:00	AJC	TAL CAN
Total Recoverable	Analysis	6020		1	303332	11/13/17 19:35	RKT	TAL CAN
Dissolved	Analysis	5310 C-2000		1	303877	11/16/17 09:29	TPH	TAL CAN
Total/NA	Analysis	5310C-2000		1	303314	11/13/17 17:22	TPH	TAL CAN
Total/NA	Analysis	9056A		1	302920	11/10/17 15:51	LKG	TAL CAN
Total/NA	Analysis	9056A		1	302921	11/10/17 15:51	LKG	TAL CAN

**Client Sample ID: MW-73D\_11072017**

**Lab Sample ID: 240-87717-3**

**Date Collected: 11/07/17 13:30**

**Matrix: Water**

**Date Received: 11/09/17 09:30**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	303598	11/15/17 19:47	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	303367	11/14/17 20:54	SAM	TAL CAN

**Client Sample ID: MW-74\_11072017**

**Lab Sample ID: 240-87717-4**

**Date Collected: 11/07/17 15:10**

**Matrix: Water**

**Date Received: 11/09/17 09:30**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	303598	11/15/17 20:09	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	303367	11/14/17 21:19	SAM	TAL CAN

# Lab Chronicle

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

TestAmerica Job ID: 240-87717-1

**Client Sample ID: MW-85\_11072017**

**Lab Sample ID: 240-87717-5**

**Date Collected: 11/07/17 16:25**

**Matrix: Water**

**Date Received: 11/09/17 09:30**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	303598	11/15/17 20:31	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	303367	11/14/17 21:43	SAM	TAL CAN

**Client Sample ID: DUP-1**

**Lab Sample ID: 240-87717-6**

**Date Collected: 11/07/17 00:00**

**Matrix: Water**

**Date Received: 11/09/17 09:30**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	303598	11/15/17 20:53	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	303367	11/14/17 22:08	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

TestAmerica Job ID: 240-87717-1

## 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	12-31-17 *
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	12-31-17 *
Minnesota	NELAP	5	039-999-348	12-31-17 *
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	01-12-18 *
West Virginia DEP	State Program	3	210	12-31-17 *

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



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

**Chain of Custody Record**

MICHIGAN  
190

**TestAmerica**  
THE LEADER IN ENVIRONMENTAL TESTING

<b>Client Information</b> Client Contact: Kristoffer Hinskey Company: ARCADIS U.S., Inc. Address: 28550 Cabot Drive Suite 500 City: Novi State, Zip: MI, 48377 Phone: MI001318.0002.00002 Email: kristoffer.hinskey@arcadis-us.com Project Name: Ford LTP Livonia MI - E203631 Site: Ford Livonia		Lab PM: Pohl, Denise E-Mail: denise.pohl@testamericainc.com Carrier Tracking Net#: 240-4623-20400.10 Page: Page 10 of 10 Job #:	
<b>Due Date Requested:</b> TAT Requested (days): 10 day PO #: MI001318.0002.00002 WO #: CADENA # - E204624 E204458 Project #: 24015353 SSOW#		<b>Analysis Requested</b> MFE (Rsk-175) Fe, Mn total (6020) Fe, Mn dissolved (6020) TOC (5310) DOC (5310) Nitrate (9056A) Sulfate (9056A-280)	
<b>Sample Identification</b> Sample ID: MW-72-11072017 MW-735-11072017 MW-73D-11072017 MW-74-11072017 MW-85-11072017 DUP-1		Field Filtered Sample (Yes or No): Perform MS/MSD (Yes or No): Total Number of Containers: MS/MSD	
<b>Sample Date</b> : 11-7-17 <b>Sample Time</b> : 940 <b>Sample Type</b> (C=Comp, G=grab): G <b>Preservation Code</b> : G <b>Matrix</b> (W=water, S=solid, O=wastewat, ST=tissue, A=air): Water		<b>Special Instructions/Note:</b> 240-87717 Chain of Custody	
<b>Preservation Codes:</b> A - HCL B - NaOH C - Zn Acetate D - Nitric Acid E - NaHSO4 F - MeOH G - Amchlor H - Ascorbic Acid I - Ice J - DI Water K - EDTA L - EDA M - Hexane N - None O - AsNaO2 P - Na2OAS Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH4.5 Z - other (specify)			
<b>Special Instructions/Note:</b> Sample Disposal (A 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 Special Instructions/QC Requirements: Submit through Custody with jim.tomalica@arcadis.com			
<b>Reinquisitioned by:</b> Severin Presswood <b>Reinquisitioned by:</b> Ashlee Reibel <b>Reinquisitioned by:</b> Ashlee Reibel Custody Seal No.: Δ Yes    Δ No		<b>Time</b> Date/Time: 11-8-17 1745 Date/Time: 11-8-17 1055 Date/Time: 11-8-17 1930 Date/Time: 11-8-17 745 Date/Time: 11-8-17 1055 Date/Time: 11-9-17 930	
<b>Company:</b> ARCADIS <b>Company:</b> ARCADIS <b>Company:</b> ARCADIS <b>Company:</b> ARCADIS		<b>Company:</b> ARCADIS <b>Company:</b> ARCADIS <b>Company:</b> ARCADIS <b>Company:</b> ARCADIS	




TestAmerica Canton Sample Receipt Form/Narrative  
Canton Facility

Login # : 87717

Client ARCADIS Site Name \_\_\_\_\_ Cooler unpacked by: POP  
Cooler Received on 11-9-17 Opened on 11-9-17  
FedEx: 1<sup>st</sup>  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 °C) Observed Cooler Temp. \_\_\_\_\_ °C Corrected Cooler Temp. \_\_\_\_\_ °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?  
 If yes, Questions 11-15 have been checked at the originating laboratory.
11. Were all preserved sample(s) at the correct pH upon receipt?  Yes  No NA pH Strip Lot# HC697954
12. Were VOAs on the COC?  Yes  No
13. Were air bubbles >6 mm in any VOA vials?  Yes  No NA  ← Larger than this.
14. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # \_\_\_\_\_  Yes  No
15. 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): \_\_\_\_\_

TestAmerica Multiple Cooler Receipt Form/Narrative  
Canton Facility

Login #: 81217

Cooler #	IR Gun #	Observed Temp °C	Corrected Temp °C	Coolant
Client	8	1.8	1.8	Ice
1	1	1.2	1.2	1

X:\X-Drive Document Control\SOPs\Work Instructions\Word Version Work Instructions\WJ-NC-099H-071615 Cooler Receipt Form\_page 2 - Multiple Coolers.doc xls

Temperature readings: \_\_\_\_\_

<u>Client Sample ID</u>	<u>Lab ID</u>	<u>Container Type</u>	<u>Container pH</u>	<u>Preservative Added (mls)</u>	<u>Lot #</u>
MW-73S_11072017	240-87717-O-2	Plastic 500ml - with Nitric Acid	<2	_____	_____
MW-73S_11072017	240-87717-P-2	Plastic 500ml - w/ Nitric - Dis.	<2	_____	_____

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