

## ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

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

TestAmerica Job ID: 240-108559-1

Client Project/Site: Ford LTP Livonia MI - E203631

For:

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

Attn: Kristoffer Hinskey



Authorized for release by:  
2/28/2019 3:15:10 PM

Michael DelMonico, Project Manager I  
(330)497-9396  
[michael.delmonico@testamericainc.com](mailto:michael.delmonico@testamericainc.com)

### LINKS

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[www.testamericainc.com](http://www.testamericainc.com)

*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 - E203631

TestAmerica Job ID: 240-108559-1

## Qualifiers

### GC/MS VOA

Qualifier	Qualifier Description
U	Indicates the analyte was analyzed for but not detected.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

## Glossary

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

# Case Narrative

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

TestAmerica Job ID: 240-108559-1

**Job ID: 240-108559-1**

**Laboratory: TestAmerica Canton**

**Narrative**

## CASE NARRATIVE

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

**Project: Ford LTP Livonia MI - E203631**

**Report Number: 240-108559-1**

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 sample was 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, sample was 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 sample was received on 2/27/2019 8:20 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 0.8° C.

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

Sample MW-150S\_022519 (240-108559-1) was analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260B. The sample was analyzed on 02/27/2019.

There was an MS/MSD analyzed in batch 240-369594 but could not be reported because the associated sample needed reanalyzed in a different batch: MW-150S\_022519 (240-108559-1).

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

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

Sample MW-150S\_022519 (240-108559-1) was analyzed for volatile organic compounds (GCMS SIM) in accordance with EPA SW-846 Method 8260B SIM. The sample was analyzed on 02/27/2019.

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

# Case Narrative

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

TestAmerica Job ID: 240-108559-1

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**Job ID: 240-108559-1 (Continued)**

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**Laboratory: TestAmerica Canton (Continued)**

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# Method Summary

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

TestAmerica Job ID: 240-108559-1

Method	Method Description	Protocol	Laboratory
8260B	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
8260B SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL CAN
5030B	Purge and Trap	SW846	TAL CAN

**Protocol References:**

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

**Laboratory References:**

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



# Sample Summary

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

TestAmerica Job ID: 240-108559-1

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Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-108559-1	MW-150S_022519	Water	02/25/19 13:30	02/27/19 08:20

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# Detection Summary

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

TestAmerica Job ID: 240-108559-1

**Client Sample ID: MW-150S\_022519**

**Lab Sample ID: 240-108559-1**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	0.46	J	1.0	0.20	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Canton

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# Client Sample Results

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

TestAmerica Job ID: 240-108559-1

**Client Sample ID: MW-150S\_022519**

**Lab Sample ID: 240-108559-1**

**Date Collected: 02/25/19 13:30**

**Matrix: Water**

**Date Received: 02/27/19 08:20**

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/27/19 14:12	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	90		63 - 125					02/27/19 14:12	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/27/19 16:21	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/27/19 16:21	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/27/19 16:21	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/27/19 16:21	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/27/19 16:21	1
<b>Vinyl chloride</b>	<b>0.46</b>	<b>J</b>	1.0	0.20	ug/L			02/27/19 16:21	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	110		70 - 121					02/27/19 16:21	1
4-Bromofluorobenzene (Surr)	88		59 - 120					02/27/19 16:21	1
Toluene-d8 (Surr)	93		70 - 123					02/27/19 16:21	1
Dibromofluoromethane (Surr)	95		75 - 128					02/27/19 16:21	1

# Surrogate Summary

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

TestAmerica Job ID: 240-108559-1

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

Matrix: Water

Prep Type: Total/NA

### Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	DCA (70-121)	BFB (59-120)	TOL (70-123)	DBFM (75-128)
240-108559-1	MW-150S_022519	110	88	93	95
LCS 240-369594/4	Lab Control Sample	98	105	101	87
MB 240-369594/7	Method Blank	109	89	96	93

#### Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)  
BFB = 4-Bromofluorobenzene (Surr)  
TOL = Toluene-d8 (Surr)  
DBFM = Dibromofluoromethane (Surr)

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

Matrix: Water

Prep Type: Total/NA

### Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	DCA (63-125)
240-108559-1	MW-150S_022519	90
500-159168-B-2 MS	Matrix Spike	88
500-159168-B-2 MSD	Matrix Spike Duplicate	86
LCS 240-369608/4	Lab Control Sample	83
MB 240-369608/5	Method Blank	84

#### Surrogate Legend

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

# QC Sample Results

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

TestAmerica Job ID: 240-108559-1

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

Lab Sample ID: MB 240-369594/7

Matrix: Water

Analysis Batch: 369594

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/27/19 15:05	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/27/19 15:05	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/27/19 15:05	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/27/19 15:05	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/27/19 15:05	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/27/19 15:05	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	109		70 - 121		02/27/19 15:05	1
4-Bromofluorobenzene (Surr)	89		59 - 120		02/27/19 15:05	1
Toluene-d8 (Surr)	96		70 - 123		02/27/19 15:05	1
Dibromofluoromethane (Surr)	93		75 - 128		02/27/19 15:05	1

Lab Sample ID: LCS 240-369594/4

Matrix: Water

Analysis Batch: 369594

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10.0	9.07		ug/L		91	65 - 139
cis-1,2-Dichloroethene	10.0	9.01		ug/L		90	76 - 128
Tetrachloroethene	10.0	8.40		ug/L		84	74 - 130
trans-1,2-Dichloroethene	10.0	9.21		ug/L		92	78 - 133
Trichloroethene	10.0	7.95		ug/L		80	76 - 125
Vinyl chloride	10.0	10.8		ug/L		108	58 - 143

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	98		70 - 121
4-Bromofluorobenzene (Surr)	105		59 - 120
Toluene-d8 (Surr)	101		70 - 123
Dibromofluoromethane (Surr)	87		75 - 128

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

Lab Sample ID: MB 240-369608/5

Matrix: Water

Analysis Batch: 369608

Client Sample ID: Method Blank

Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/27/19 12:32	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	84		63 - 125		02/27/19 12:32	1

TestAmerica Canton

# QC Sample Results

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

TestAmerica Job ID: 240-108559-1

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

**Lab Sample ID: LCS 240-369608/4**

**Matrix: Water**

**Analysis Batch: 369608**

**Client Sample ID: Lab Control Sample**

**Prep Type: Total/NA**

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	10.0	11.2		ug/L		112	59 - 131
<b>Surrogate</b>	<b>%Recovery</b>	<b>LCS Qualifier</b>	<b>Limits</b>				
1,2-Dichloroethane-d4 (Surr)	83		63 - 125				

**Lab Sample ID: 500-159168-B-2 MS**

**Matrix: Water**

**Analysis Batch: 369608**

**Client Sample ID: Matrix Spike**

**Prep Type: Total/NA**

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	2.0	U	10.0	11.4		ug/L		114	52 - 129
<b>Surrogate</b>	<b>%Recovery</b>	<b>MS Qualifier</b>	<b>Limits</b>						
1,2-Dichloroethane-d4 (Surr)	88		63 - 125						

**Lab Sample ID: 500-159168-B-2 MSD**

**Matrix: Water**

**Analysis Batch: 369608**

**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	11.3		ug/L		113	52 - 129	1	13
<b>Surrogate</b>	<b>%Recovery</b>	<b>MSD Qualifier</b>	<b>Limits</b>								
1,2-Dichloroethane-d4 (Surr)	86		63 - 125								

# QC Association Summary

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

TestAmerica Job ID: 240-108559-1

## GC/MS VOA

### Analysis Batch: 369594

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-108559-1	MW-150S_022519	Total/NA	Water	8260B	
MB 240-369594/7	Method Blank	Total/NA	Water	8260B	
LCS 240-369594/4	Lab Control Sample	Total/NA	Water	8260B	

### Analysis Batch: 369608

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-108559-1	MW-150S_022519	Total/NA	Water	8260B SIM	
MB 240-369608/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-369608/4	Lab Control Sample	Total/NA	Water	8260B SIM	
500-159168-B-2 MS	Matrix Spike	Total/NA	Water	8260B SIM	
500-159168-B-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

# Lab Chronicle

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

TestAmerica Job ID: 240-108559-1

**Client Sample ID: MW-150S\_022519**

**Lab Sample ID: 240-108559-1**

**Date Collected: 02/25/19 13:30**

**Matrix: Water**

**Date Received: 02/27/19 08:20**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	369594	02/27/19 16:21	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	369608	02/27/19 14:12	SAM	TAL CAN

**Laboratory References:**

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

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# Accreditation/Certification Summary

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

TestAmerica Job ID: 240-108559-1

## Laboratory: TestAmerica Canton

All accreditations/certifications held by this laboratory are listed. Not all accreditations/certifications are applicable to this report.

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-19 *
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-19
Illinois	NELAP	5	200004	07-31-19
Kansas	NELAP	7	E-10336	04-30-19
Kentucky (UST)	State Program	4	58	02-23-20
Kentucky (WW)	State Program	4	98016	12-31-19
Minnesota	NELAP	5	039-999-348	12-31-19 *
Minnesota (Petrofund)	State Program	1	3506	07-31-19
Nevada	State Program	9	OH00048	07-31-19
New Jersey	NELAP	2	OH001	06-30-19
New York	NELAP	2	10975	03-31-19 *
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-20
Pennsylvania	NELAP	3	68-00340	08-31-19 *
Texas	NELAP	6	T104704517-18-10	08-31-19
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-19
Washington	State Program	10	C971	01-12-20 *
West Virginia DEP	State Program	3	210	12-31-19

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

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

MICHIGAN  
190

Chain of Custody Record

MICHIGAN  
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TestAmerica  
THE LEADER IN ENVIRONMENTAL TESTING

**Client Information**

Client Contact:  
Angela DeGrandis  
Company:  
ARCADIS U.S., Inc.

**Sampler:** K. LeBesque

Lab PM:  
DelMontico, Michael  
E-Mail:  
michael.delmontico@testamerica.com

**Due Date Requested:**

TAT Requested (days):  
1 day / 24-HR

**PO #:** MI001454.0003.00002

WO #:  
Cadena #: E203631

**Project Name:** Ford LTP Livonia MI - E203631

SSOW #:

**Address:** 28550 Cabot Drive Suite 500

City:  
Novi  
State, Zip:  
MI, 48377  
Phone:

**Carrier Tracking No(s):**

COC No:  
240-58422-24977.9  
Page:  
9 of 15 - 1/1  
Job #:

**Analysis Requested**

Perform MS/MSD (Yes or No)  
Field Filtered Sample (Yes or No)  
8260B - VOCs (Short List)  
8260B - SIM - 14-Dioxane

**Sample Identification**

MW-150s-022519

**Sample Date**

2/25/19 1330 G

**Sample Time**

Water

**Matrix**

Water

**Sample Type**

Water

**Sample Date**

2/25/19 1730

**Date/Time**

2/24/19 14:15

**Date/Time**

2/27/19 8:00

**Possible Hazard Identification**

Non-Hazard  Flammable  Skin Irritant  Poison B  Unknown  Radiological

**Deliverable Requested:** I, II, III, IV, Other (specify)

LEVEL IV REPORTING

**Empty Kit Relinquished by:**

Relinquished by: *Angela DeGrandis*  
Date: 2/25/19 17:30  
Company: ARCADIS

**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/OC Requirements:**

Special Instructions/Note:  
6 EXHIBIT ALL RESULTS THROUGH JIM.TOMALIA@CAPENA.COM

**Relinquished by:**

Relinquished by: *Carol O'Neil*  
Date: 2/24/19 15:53  
Company: ARCADIS

**Custody Seals Intact:**

Yes  No  
Custody Seal No.:

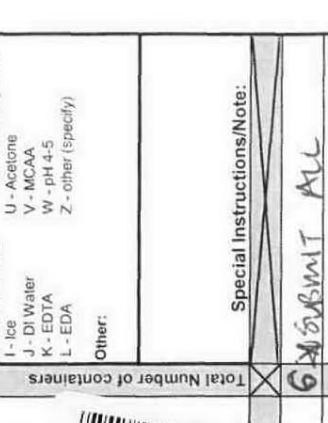
**Relinquished by:**

Relinquished by: *Michael DelMontico*  
Date: 2/27/19 8:00  
Company: ARCADIS

**Cooler Temperature(s) °C and Other Remarks:**

Cooler Temperature(s) °C and Other Remarks:

Sample ID	Sample Date	Sample Time	Sample Type	Matrix	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8260B - VOCs (Short List)	8260B - SIM - 14-Dioxane	Total Number of Containers	Special Instructions/Note:
MW-150s-022519	2/25/19	1330	G	Water	XX	XX	XX	XX	6	EXHIBIT ALL RESULTS THROUGH JIM.TOMALIA@CAPENA.COM



240-108559 Chain of Custody

Ver. 01/16/2019




**TestAmerica Canton Sample Receipt Form/Narrative**  
**Canton Facility**

Login # : 106554

Client ARCADIS Site Name \_\_\_\_\_ Cooler unpacked by: \_\_\_\_\_  
 Cooler Received on 2/27/19 Opened on 2/27/19  
 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 # 7A 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 -0.2 °C) Observed Cooler Temp. 1.0 °C Corrected Cooler Temp. 0.8 °C  
 IR GUN #36 (CF +0.7°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 NA  
 -Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No NA
4. Did custody papers accompany the sample(s)? Yes No NA
5. Were the custody papers relinquished & signed in the appropriate place? Yes No NA
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No NA
7. Did all bottles arrive in good condition (Unbroken)? Yes No NA
8. Could all bottle labels be reconciled with the COC? Yes No NA
9. Were correct bottle(s) used for the test(s) indicated? Yes No NA
10. Sufficient quantity received to perform indicated analyses? Yes No NA
11. Are these work share samples? Yes No NA  
 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# HC861525
13. Were VOAs on the COC? Yes No NA
14. Were air bubbles >6 mm in any VOA vials?  Yes  No  NA  Larger than this.
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # \_\_\_\_\_ Yes No NA
16. Was a LL Hg or Me Hg trip blank present? Yes No NA

Tests that are not checked for pH by Receiving:  
  
 VOAs  
 Oil and Grease  
 TOC

Contacted PM \_\_\_\_\_ Date \_\_\_\_\_ by \_\_\_\_\_ via Verbal Voice Mail Other \_\_\_\_\_

Concerning \_\_\_\_\_

**17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES**

Samples processed by: JR

**18. SAMPLE CONDITION**

Sample(s) \_\_\_\_\_ were received after the recommended holding time had expired.  
 Sample(s) \_\_\_\_\_ were received in a broken container.  
 Sample(s) \_\_\_\_\_ were received with bubble >6 mm in diameter. (Notify PM)

**19. SAMPLE PRESERVATION**

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

VOA Sample Preservation - Date/Time VOAs Frozen: \_\_\_\_\_



February 28, 2019

Kris Hinskey  
Arcadis Inc  
10559 Citation Ave  
Suite 100  
Brighton, MI 48116

CADENA project ID: E203631  
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater  
Project number: MI001454.0002/3/4.00002/2B/3B  
Client project scope reference: Sample COC only was used to define project analytical requirements.  
Laboratory: TestAmerica - North Canton  
Laboratory submittal: 108559-1  
Sample date: 2019-02-25  
Report received by CADENA: 2019-02-28  
Initial Data Verification completed by CADENA: 2019-02-28

There were no significant QC anomalies or exceptions to report.

GCMS VOC QC batch MS/MSD issues as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package verification review.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

1 Water sample was analyzed for GCMS VOC parameter(s).

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Analytical results reported between RDL and MDL are flagged 'J' and considered estimated values.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at <http://clms.cadenaco.com/index.cfm>.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

## CADENA Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminants) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminants) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

## SAMPLING AND ANALYSIS SUMMARY

**CADENA Project ID:** E203631

**Laboratory:** TestAmerica-North Canton

**Laboratory Submittal:** 108559-1

Lab Sample ID	Sample ID	Collection Date (mm/yy/dd)	Collection Time (hh:mm:ss)	Volatile Organics by GCMS	8260B with Single Ion Monitoring	Comment
2401085591	MW-150S_022519	2/25/2019	1:30:00	X	X	

# Analytical Results Summary

## Reportable Results Only

CADENA Project ID: E203631

Laboratory: TestAmerica - North Canton

Laboratory Submittal: 108559-1

Sample Name: MW-150S\_022519

Lab Sample ID: 2401085591

Sample Date: 2/25/2019

Analyte	Cas No.	Result	Report		Valid	
			Limit	Units		Qualifier
<b>GC/MS VOC</b>						
<u>OSW-8260B</u>						
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	
Trichloroethene	79-01-6	ND	1.0	ug/l	---	
Vinyl chloride	75-01-4	0.46	1.0	ug/l	J	
<u>OSW-8260BBSim</u>						
1,4-Dioxane	123-91-1	ND	2.0	ug/l	---	

# Ford Motor Company – Livonia Transmission Project

## DATA REVIEW

### Livonia, Michigan

Volatile Organic Compounds (VOC) Analysis

SDG #240-108559-1

CADENA Verification Report: 2019-02-28

Analyses Performed By:

TestAmerica  
Canton, Ohio

Report #31902R

Review Level: Tier II/Plus

Project: MI001454.0003.00002



## DATA REVIEW

# SUMMARY

This data quality assessment/verification summarizes the confirmation of detected compounds (if applicable), review of the verification/Tier II validation review performed by CADENA Inc. and review of level II laboratory data package completeness for Sample Delivery Group (SDG) # 240-108559-1 for samples collected in association with the Ford – Livonia, Michigan site. Only detected compound confirmations and omitted deviations from the CADENA verification/Tier II report are documented in this report. The Tier II/Plus validation is performed in the instance when a sample location has a detection at a concentration of 5 ppb or less. The detection and the concentration are reviewed and verified based on the instrument calibration and laboratory raw data. Only analytical data associated with constituents of concern were reviewed for this verification. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

SDG	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
						VOC	VOC (SIM)	MISC
240-108559-1	MW-150S_022519	240-108559-1	Water	2/25/2019		X	X	

Notes:

VOC = volatile organic compound

SIM = selective ion monitoring

MISC = miscellaneous

## DATA REVIEW

### ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	



## DATA REVIEW

### ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.
  - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
  - E The compound was quantitated above the calibration range.
  - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
  - J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
  - UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
  - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## DATA REVIEW

### VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

#### 1. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

##### 1.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (15%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

##### 1.2 Continuing Calibration

All target compounds associated with the continuing calibration verification (CCV) standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

#### 2. Compound Identification

Compounds are identified on the GC/MS by using the analyte's relative retention time, ion spectra, and concentration.

All identified compounds met the criteria defined in the analytical method.

#### 3. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in the CADENA Inc. review and this review, the overall data quality is within the guidelines specified in the method.

**DATA REVIEW**

**DATA VALIDATION CHECKLIST FOR VOCs**

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
<b>GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)</b>					
<b>Tier II+ Validation</b>					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	

Notes:

RT      retention time

VERIFICATION/VALIDATION PERFORMED BY: Andrew Korycinski

SIGNATURE:



DATE: March 6, 2019

PEER REVIEW: Dennis Capria

DATE: March 6, 2019



**CHAIN OF CUSTODY  
CORRECTED SAMPLE ANALYSIS DATA  
SHEETS**





# Client Sample Results

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

TestAmerica Job ID: 240-108559-1

**Client Sample ID: MW-150S\_022519**

**Lab Sample ID: 240-108559-1**

**Date Collected: 02/25/19 13:30**

**Matrix: Water**

**Date Received: 02/27/19 08:20**

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.86	ug/L			02/27/19 14:12	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	90		63 - 125					02/27/19 14:12	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/27/19 16:21	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/27/19 16:21	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/27/19 16:21	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/27/19 16:21	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/27/19 16:21	1
<b>Vinyl chloride</b>	<b>0.46</b>	<b>J</b>	1.0	0.20	ug/L			02/27/19 16:21	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	110		70 - 121					02/27/19 16:21	1
4-Bromofluorobenzene (Surr)	88		59 - 120					02/27/19 16:21	1
Toluene-d8 (Surr)	93		70 - 123					02/27/19 16:21	1
Dibromofluoromethane (Surr)	95		75 - 128					02/27/19 16:21	1