TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

# ANALYTICAL REPORT

TestAmerica Laboratories, Inc.
TestAmerica Canton
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North Canton, OH 44720
Tel: (330)497-9396

TestAmerica Job ID: 240-108699-1
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:*
*3/14/2019 9:52:57 AM*

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

## Job ID: 240-108699-1

**Laboratory: TestAmerica Canton**

**Narrative**

# CASE NARRATIVE

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

## Project: Ford LTP Livonia MI - E203631

## Report Number: 240-108699-1

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 sample was received on 2/28/2019 8:00 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.6° C.

**VOLATILE ORGANIC COMPOUNDS (GCMS)**

Sample MW-90S_022619 (240-108699-1) was analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260B. The sample was analyzed on 03/01/2019.

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

**VOLATILE ORGANIC COMPOUNDS (GCMS SIM)**

Sample MW-90S_022619 (240-108699-1) was analyzed for volatile organic compounds (GCMS SIM) in accordance with EPA SW-846 Method 8260B SIM. The sample was analyzed on 03/06/2019.

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 - E203631

TestAmerica Job ID: 240-108699-1

| 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: 240-108699-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received |
|---|---|---|---|---|
| 240-108699-1 | MW-90S_022619 | Water | 02/26/19 15:38 | 02/28/19 08:00 |

# Detection Summary

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

TestAmerica Job ID: 240-108699-1

**Client Sample ID: MW-90S_022619** **Lab Sample ID: 240-108699-1**

No Detections.

This Detection Summary does not include radiochemical test results.

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

TestAmerica Job ID: 240-108699-1

**Client Sample ID: MW-90S_022619**
**Date Collected: 02/26/19 15:38**
**Date Received: 02/28/19 08:00**

**Lab Sample ID: 240-108699-1**
**Matrix: Water**

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

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1,4-Dioxane | 2.0 | U | 2.0 | 0.86 | ug/L | | | 03/06/19 14:12 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *1,2-Dichloroethane-d4 (Surr)* | *85* | | *63 - 125* | | *03/06/19 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 | | | 03/01/19 19:25 | 1 |
| cis-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.16 | ug/L | | | 03/01/19 19:25 | 1 |
| Tetrachloroethene | 1.0 | U | 1.0 | 0.15 | ug/L | | | 03/01/19 19:25 | 1 |
| trans-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.19 | ug/L | | | 03/01/19 19:25 | 1 |
| Trichloroethene | 1.0 | U | 1.0 | 0.10 | ug/L | | | 03/01/19 19:25 | 1 |
| Vinyl chloride | 1.0 | U | 1.0 | 0.20 | ug/L | | | 03/01/19 19:25 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *1,2-Dichloroethane-d4 (Surr)* | *92* | | *70 - 121* | | *03/01/19 19:25* | *1* |
| *4-Bromofluorobenzene (Surr)* | *66* | | *59 - 120* | | *03/01/19 19:25* | *1* |
| *Toluene-d8 (Surr)* | *73* | | *70 - 123* | | *03/01/19 19:25* | *1* |
| *Dibromofluoromethane (Surr)* | *91* | | *75 - 128* | | *03/01/19 19:25* | *1* |

# Surrogate Summary

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

TestAmerica Job ID: 240-108699-1

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

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

| | | Percent Surrogate Recovery (Acceptance Limits) | | | |
|---|---|---|---|---|---|
| | | DCA | BFB | TOL | DBFM |
| Lab Sample ID | Client Sample ID | (70-121) | (59-120) | (70-123) | (75-128) |
| 240-108594-E-3 MS | Matrix Spike | 91 | 80 | 81 | 101 |
| 240-108594-H-3 MSD | Matrix Spike Duplicate | 89 | 81 | 81 | 99 |
| 240-108699-1 | MW-90S_022619 | 92 | 66 | 73 | 91 |
| LCS 240-369935/4 | Lab Control Sample | 92 | 84 | 86 | 101 |
| MB 240-369935/6 | Method Blank | 90 | 70 | 75 | 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) |
|---|---|---|
| | | DCA |
| Lab Sample ID | Client Sample ID | (63-125) |
| 240-108699-1 | MW-90S_022619 | 85 |
| 240-108737-D-4 MS | Matrix Spike | 83 |
| 240-108737-D-4 MSD | Matrix Spike Duplicate | 84 |
| LCS 240-370526/4 | Lab Control Sample | 83 |
| MB 240-370526/5 | Method Blank | 87 |

**Surrogate Legend**

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

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

**Lab Sample ID: MB 240-369935/6**
**Matrix: Water**
**Analysis Batch: 369935**

**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 | | | 03/01/19 13:00 | 1 |
| cis-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.16 | ug/L | | | 03/01/19 13:00 | 1 |
| Tetrachloroethene | 1.0 | U | 1.0 | 0.15 | ug/L | | | 03/01/19 13:00 | 1 |
| trans-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.19 | ug/L | | | 03/01/19 13:00 | 1 |
| Trichloroethene | 1.0 | U | 1.0 | 0.10 | ug/L | | | 03/01/19 13:00 | 1 |
| Vinyl chloride | 1.0 | U | 1.0 | 0.20 | ug/L | | | 03/01/19 13:00 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *1,2-Dichloroethane-d4 (Surr)* | *90* | | *70 - 121* | | *03/01/19 13:00* | *1* |
| *4-Bromofluorobenzene (Surr)* | *70* | | *59 - 120* | | *03/01/19 13:00* | *1* |
| *Toluene-d8 (Surr)* | *75* | | *70 - 123* | | *03/01/19 13:00* | *1* |
| *Dibromofluoromethane (Surr)* | *93* | | *75 - 128* | | *03/01/19 13:00* | *1* |

**Lab Sample ID: LCS 240-369935/4**
**Matrix: Water**
**Analysis Batch: 369935**

**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 | 10.7 | | ug/L | | 107 | 65 - 139 |
| cis-1,2-Dichloroethene | 10.0 | 12.4 | | ug/L | | 124 | 76 - 128 |
| Tetrachloroethene | 10.0 | 11.6 | | ug/L | | 116 | 74 - 130 |
| trans-1,2-Dichloroethene | 10.0 | 12.9 | | ug/L | | 129 | 78 - 133 |
| Trichloroethene | 10.0 | 12.2 | | ug/L | | 122 | 76 - 125 |
| Vinyl chloride | 10.0 | 10.5 | | ug/L | | 105 | 58 - 143 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *1,2-Dichloroethane-d4 (Surr)* | *92* | | *70 - 121* |
| *4-Bromofluorobenzene (Surr)* | *84* | | *59 - 120* |
| *Toluene-d8 (Surr)* | *86* | | *70 - 123* |
| *Dibromofluoromethane (Surr)* | *101* | | *75 - 128* |

**Lab Sample ID: MRL 240-369935/5**
**Matrix: Water**
**Analysis Batch: 369935**

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

| Analyte | Spike Added | MRL Result | MRL Qualifier | Unit | D | %Rec | %Rec. Limits |
|---|---|---|---|---|---|---|---|
| Vinyl chloride | 0.00100 | 0.000822 | J | ng/uL | | 82 | 10 - 150 |

**Lab Sample ID: 240-108594-E-3 MS**
**Matrix: Water**
**Analysis Batch: 369935**

**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 |
|---|---|---|---|---|---|---|---|---|---|
| 1,1-Dichloroethene | 22 | | 10.0 | 28.1 | | ug/L | | 64 | 53 - 140 |
| cis-1,2-Dichloroethene | 3.9 | | 10.0 | 15.3 | | ug/L | | 114 | 64 - 130 |
| Tetrachloroethene | 1.0 | U | 10.0 | 9.76 | | ug/L | | 98 | 51 - 136 |
| trans-1,2-Dichloroethene | 1.0 | U | 10.0 | 12.0 | | ug/L | | 120 | 68 - 133 |
| Trichloroethene | 4.3 | | 10.0 | 14.9 | | ug/L | | 107 | 55 - 131 |

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

**Lab Sample ID: 240-108594-E-3 MS**
**Matrix: Water**
**Analysis Batch: 369935**

**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 |
|---|---|---|---|---|---|---|---|---|---|
| Vinyl chloride | 1.0 | U | 10.0 | 8.75 | | ug/L | | 87 | 43 - 154 |

| *Surrogate* | *MS %Recovery* | *MS Qualifier* | *Limits* |
|---|---|---|---|
| *1,2-Dichloroethane-d4 (Surr)* | *91* | | *70 - 121* |
| *4-Bromofluorobenzene (Surr)* | *80* | | *59 - 120* |
| *Toluene-d8 (Surr)* | *81* | | *70 - 123* |
| *Dibromofluoromethane (Surr)* | *101* | | *75 - 128* |

**Lab Sample ID: 240-108594-H-3 MSD**
**Matrix: Water**
**Analysis Batch: 369935**

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

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD Result | MSD Qualifier | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1-Dichloroethene | 22 | | 10.0 | 29.3 | | ug/L | | 76 | 53 - 140 | 4 | 35 |
| cis-1,2-Dichloroethene | 3.9 | | 10.0 | 15.1 | | ug/L | | 112 | 64 - 130 | 2 | 21 |
| Tetrachloroethene | 1.0 | U | 10.0 | 9.93 | | ug/L | | 99 | 51 - 136 | 2 | 23 |
| trans-1,2-Dichloroethene | 1.0 | U | 10.0 | 11.9 | | ug/L | | 119 | 68 - 133 | 1 | 24 |
| Trichloroethene | 4.3 | | 10.0 | 14.8 | | ug/L | | 105 | 55 - 131 | 1 | 23 |
| Vinyl chloride | 1.0 | U | 10.0 | 10.6 | | ug/L | | 106 | 43 - 154 | 20 | 29 |

| *Surrogate* | *MSD %Recovery* | *MSD Qualifier* | *Limits* |
|---|---|---|---|
| *1,2-Dichloroethane-d4 (Surr)* | *89* | | *70 - 121* |
| *4-Bromofluorobenzene (Surr)* | *81* | | *59 - 120* |
| *Toluene-d8 (Surr)* | *81* | | *70 - 123* |
| *Dibromofluoromethane (Surr)* | *99* | | *75 - 128* |

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

**Lab Sample ID: MB 240-370526/5**
**Matrix: Water**
**Analysis Batch: 370526**

**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 | | | 03/06/19 12:53 | 1 |

| *Surrogate* | *MB %Recovery* | *MB Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *1,2-Dichloroethane-d4 (Surr)* | *87* | | *63 - 125* | | *03/06/19 12:53* | *1* |

**Lab Sample ID: LCS 240-370526/4**
**Matrix: Water**
**Analysis Batch: 370526**

**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 | 11.9 | | ug/L | | 119 | 59 - 131 |

| *Surrogate* | *LCS %Recovery* | *LCS Qualifier* | *Limits* |
|---|---|---|---|
| *1,2-Dichloroethane-d4 (Surr)* | *83* | | *63 - 125* |

# QC Sample Results

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

TestAmerica Job ID: 240-108699-1

**Lab Sample ID: 240-108737-D-4 MS**
**Matrix: Water**
**Analysis Batch: 370526**

**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 | 11.1 | | ug/L | | 111 | 52 - 129 | | |

| *Surrogate* | *MS %Recovery* | *MS Qualifier* | *Limits* |
|---|---|---|---|
| *1,2-Dichloroethane-d4 (Surr)* | *83* | | *63 - 125* |

**Lab Sample ID: 240-108737-D-4 MSD**
**Matrix: Water**
**Analysis Batch: 370526**

**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 | 11.9 | | ug/L | | 119 | 52 - 129 | 7 | 13 |

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

# QC Association Summary

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

TestAmerica Job ID: 240-108699-1

## GC/MS VOA

### Analysis Batch: 369935

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 240-108699-1 | MW-90S_022619 | Total/NA | Water | 8260B | |
| MB 240-369935/6 | Method Blank | Total/NA | Water | 8260B | |
| LCS 240-369935/4 | Lab Control Sample | Total/NA | Water | 8260B | |
| MRL 240-369935/5 | Lab Control Sample | Total/NA | Water | 8260B | |
| 240-108594-E-3 MS | Matrix Spike | Total/NA | Water | 8260B | |
| 240-108594-H-3 MSD | Matrix Spike Duplicate | Total/NA | Water | 8260B | |

### Analysis Batch: 370526

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---|---|---|---|---|---|
| 240-108699-1 | MW-90S_022619 | Total/NA | Water | 8260B SIM | |
| MB 240-370526/5 | Method Blank | Total/NA | Water | 8260B SIM | |
| LCS 240-370526/4 | Lab Control Sample | Total/NA | Water | 8260B SIM | |
| 240-108737-D-4 MS | Matrix Spike | Total/NA | Water | 8260B SIM | |
| 240-108737-D-4 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: 240-108699-1

**Client Sample ID: MW-90S_022619**
**Date Collected: 02/26/19 15:38**
**Date Received: 02/28/19 08:00**

**Lab Sample ID: 240-108699-1**
**Matrix: Water**

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|---|---|---|---|---|---|---|---|---|
| Total/NA | Analysis | 8260B | | 1 | 369935 | 03/01/19 19:25 | LEE | TAL CAN |
| Total/NA | Analysis | 8260B SIM | | 1 | 370526 | 03/06/19 14:12 | SAM | TAL CAN |

**Laboratory References:**

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

# Accreditation/Certification Summary

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

TestAmerica Job ID: 240-108699-1

## 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 | 02-23-20 |
| 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.

MICHIGAN 190 2.8|2.6

# Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

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

TestAmerica Laboratories, Inc.

| Client Contact | Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other | | |
|---|---|---|---|
| Company Name: Arcadis | Client Project Manager: Kris Hinskey | Site Contact: Angela DeGrandis | Lab Contact: Mike DelMonico |
| Address: 28550 Cabot Drive, Suite 500 | Telephone: 248-994-2240 | Telephone: 734-320-0065 | Telephone: 330-497-9396 |
| City/State/Zip: Novi, MI, 48377 | Email: kristoffer.hinskey@arcadis.com | Analysis Turnaround Time | COC No: / of / COCs |
| Phone: 248-994-2240 | | TAT if different from below ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day | For lab use only |
| Project Name: Ford LTP | | 10 day | Walk-in client |
| Project Number: ~~MI001454.0004.00002~~ MI001454.0006.00003 | Method of Shipment/Carrier: | | Lab sampling |
| PO # ~~MI001454.0004.00002~~ MI001454.0006.00003 | Shipping/Tracking No: | | Job/SDG No: |

| Sample Identification | Sample Date | Sample Time | Matrix: Air | Aqueous | Sediment | Solid | Other: | Containers & Preservatives: $H_2SO_4$ | $HNO_3$ | HCl | NaOH | ZnAc/NaOH | Unpres | Other: | Filtered Sample (Y/N) | Composite=C/Grab=G | 1,1-DCE 8260B | cis-1,2-DCE 8260B | Trans-1,2-DCE 8260B | PCE 8260B | TCE 8260B | Vinyl Chloride 8260B | 1,4-Dioxane 8260B SIM | | | | | Sample Specific Notes / Special Instructions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-90S_022619 | 2/26/19 | 1538 | | X | | | | | | X | | | | | N | G | X | X | X | X | X | X | 3 | | | | | 3 VOAs FOR 8260B<br>3 VOAs FOR 8260B SIM<br>6 VOAs TOTAL |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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240-108699 Chain of Custody

| Possible Hazard Identification | Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month) |
|---|---|
| ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown | ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months |

**Special Instructions/QC Requirements & Comments:**

Submit all results through Cadena at jim.tomalia@cadena.com, Cadena #E203631
Level IV Reporting.

| Relinquished by: | Company: | Date/Time: | Received by: | Company: | Date/Time: |
|---|---|---|---|---|---|
| RACHEL BIELAK Paul Bilak | ARCADIS | 2/26/19 1936 | NOVI COLD STORAGE | ARCADIS | 2/26/19 1936 |
| Caitlin O'Neill | ARCADIS | 02/27/19 14:15 | | TESTAMERICA | 2/27/19 1415 |
| | TESTAMERICA | 2/27/19 1520 | Received in Laboratory by: | Company: | Date/Time: |

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3/14/2019

**TestAmerica Canton Sample Receipt Form/Narrative** **Login # :** 108699
**Canton Facility**

Client Arcadis Site Name

Cooler Received on 2/28/19 Opened on 2/28/19

Cooler unpacked by:

FedEx: 1st (Grd) Exp UPS FAS Clipper Client Drop Off/ TestAmerica Courier Other

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

TestAmerica Cooler # NA 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. 2.8 °C Corrected Cooler Temp. 2.6 °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)
   -Were tamper/custody seals intact and uncompromised? (Yes) No NA
3. Shippers' packing slip attached to the cooler(s)? (Yes) No
4. Did custody papers accompany the sample(s)? (Yes) No
5. Were the custody papers relinquished & signed in the appropriate place? (Yes) No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes (No)
7. Did all bottles arrive in good condition (Unbroken)? (Yes) No
8. Could all bottle labels be reconciled with the COC? (Yes) No
9. Were correct bottle(s) used for the test(s) indicated? (Yes) No
10. Sufficient quantity received to perform indicated analyses? (Yes) No
11. Are these work share samples? Yes (No)
    If yes, Questions 12-16 have been checked at the originating laboratory.
12. Were all preserved sample(s) at the correct pH upon receipt? Yes No (NA) pH Strip Lot# **HC861525**
13. Were VOAs on the COC? (Yes) No
14. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. Yes No (NA)
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot #____ Yes (No)
16. Was a LL Hg or Me Hg trip blank present? ____ Yes (No)

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

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

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

Samples processed by: RC

**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: ____

March 14, 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: 108699-1
Sample date: 2019-02-26
Report received by CADENA: 2019-03-14
Initial Data Verification completed by CADENA: 2019-03-14

There were no significant QC anomalies or exceptions to report.

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(s) 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 contaminates) 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 contaminates) 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. |

# Analytical Results Summary

**CADENA Project ID:** E203631
**Laboratory:** TestAmerica - North Canton
**Laboratory Submittal:** 108699-1

**Sample Name:** MW-90S_022619
**Lab Sample ID:** 2401086991
**Sample Date:** 2/26/2019

| Analyte | Cas No. | Result | Report Limit | Units | Valid Qualifier |
|---|---|---|---|---|---|
| **GC/MS VOC** | | | | | |
| OSW-8260B | | | | | |
| 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 | ND | 1.0 | ug/l | --- |
| OSW-8260BBSim | | | | | |
| 1,4-Dioxane | 123-91-1 | ND | 2.0 | ug/l | --- |

ARCADIS Design & Consultancy for natural and built assets

# Ford Motor Company – Livonia Transmission Project

# DATA REVIEW

## Livonia, Michigan

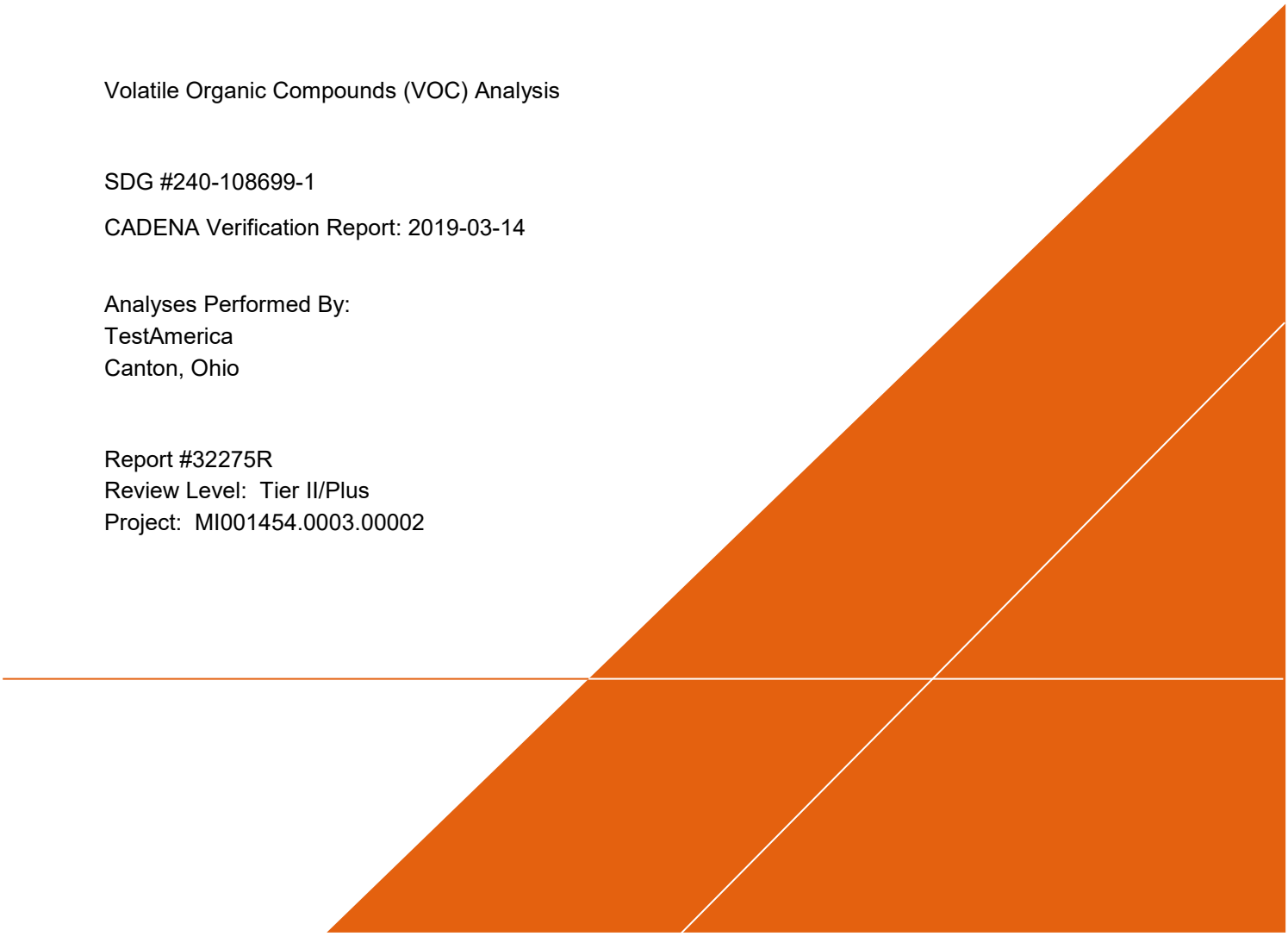
Volatile Organic Compounds (VOC) Analysis

SDG #240-108699-1

CADENA Verification Report: 2019-03-14

Analyses Performed By:
TestAmerica
Canton, Ohio

Report #32275R
Review Level: Tier II/Plus
Project: MI001454.0003.00002



# 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) # 240-108699-1 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 |
| 240-108699-1 | MW-90S_022619 | 240-108699-1 | Water | 2/26/2019 | | 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.

## 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).

Calibration criteria are only reviewed when detections were present in samples. No compounds were detected in the samples within this SDG; therefore, calibration criteria was not evaluated.

### 2. Compound Identification

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

No compounds were detected in the samples within this SDG.

### 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 VALIDATION CHECKLIST FOR VOCs

| VOCs: 8260B/8260B-SIM | Reported | | Performance Acceptable | | Not Required |
|---|---|---|---|---|---|
| | No | Yes | No | Yes | |
| **GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)** | | | | | |
| **Tier II+ Validation** | | | | | |
| 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:

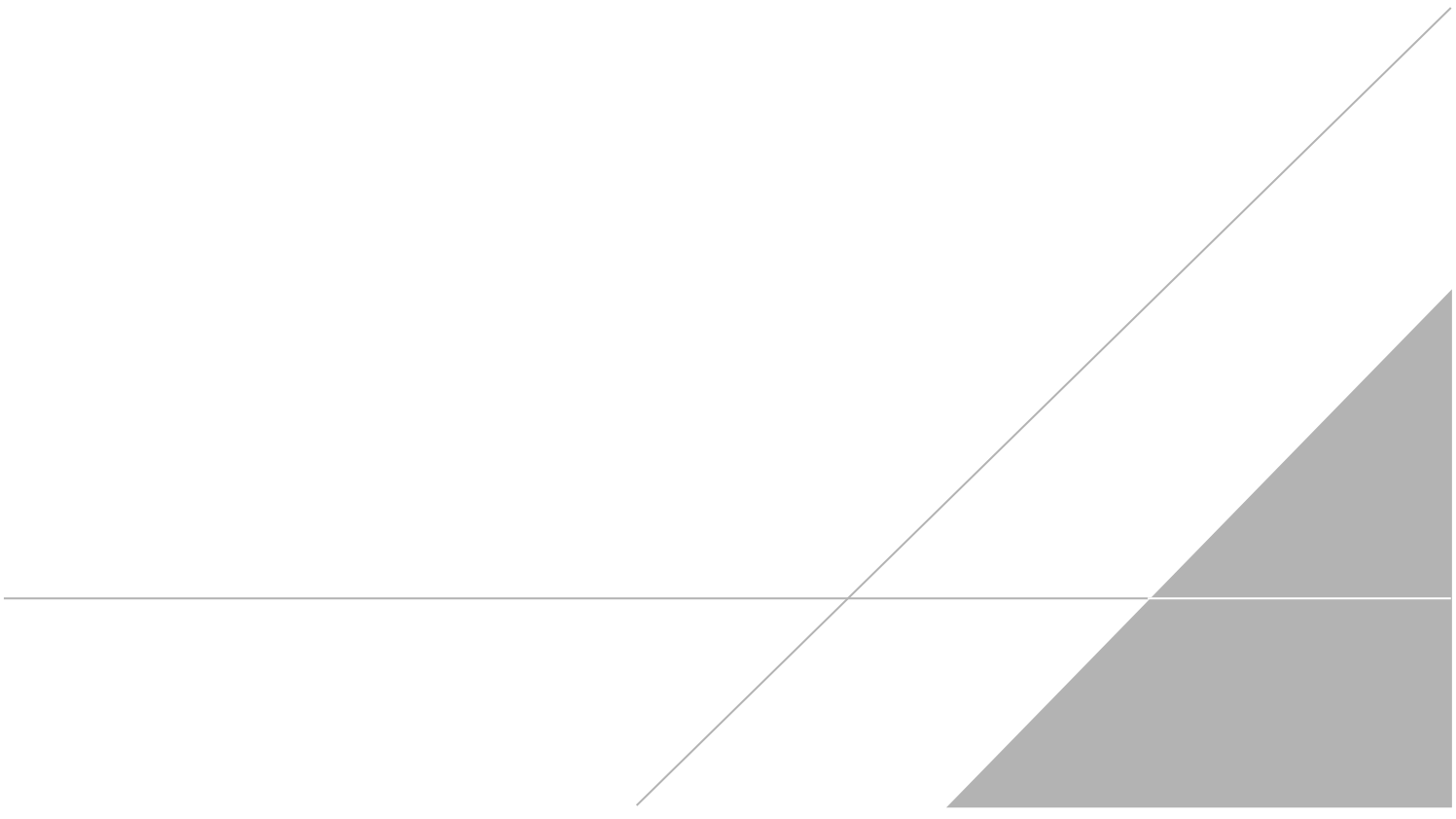
DATE: April 3, 2019

PEER REVIEW: Dennis Capria

DATE: April 3, 2019

# CHAIN OF CUSTODY

# CORRECTED SAMPLE ANALYSIS DATA SHEETS



MICHIGAN 190 2.8|2.6

# Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

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

TestAmerica Laboratories, Inc.

| Client Contact | Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other | | |
|---|---|---|---|
| Company Name: Arcadis | Client Project Manager: Kris Hinskey | Site Contact: Angela DeGrandis | Lab Contact: Mike DelMonico |
| Address: 28550 Cabot Drive, Suite 500 | Telephone: 248-994-2240 | Telephone: 734-320-0065 | Telephone: 330-497-9396 |
| City/State/Zip: Novi, MI, 48377 | Email: kristoffer.hinskey@arcadis.com | Analysis Turnaround Time | COC No: / of / COCs |
| Phone: 248-994-2240 | | TAT if different from below ☐ 3 weeks ☑ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day | For lab use only |
| Project Name: Ford LTP | | 10 day | Walk-in client |
| Project Number: ~~MI001454.0004.00002~~ MI001454.0006.00003 | Method of Shipment/Carrier: | | Lab sampling |
| PO # ~~MI001454.0004.00002~~ MI001454.0006.00003 | Shipping/Tracking No: | | Job/SDG No: |

| Sample Identification | Sample Date | Sample Time | Matrix: Air | Aqueous | Sediment | Solid | Other: | Containers & Preservatives: $H_2SO_4$ | $HNO_3$ | HCl | NaOH | ZnAc/NaOH | Unpres | Other: | Filtered Sample (Y/N) | Composite=C/Grab=G | 1,1-DCE 8260B | cis-1,2-DCE 8260B | Trans-1,2-DCE 8260B | PCE 8260B | TCE 8260B | Vinyl Chloride 8260B | 1,4-Dioxane 8260B SIM | | | | | Sample Specific Notes / Special Instructions: |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MW-90S_022619 | 2/26/19 | 1538 | | X | | | | | | X | | | | | N | G | X | X | X | X | X | X | 3 | | | | | 3 VOAs FOR 8260B<br>3 VOAs FOR 8260B SIM<br>6 VOAs TOTAL |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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240-108699 Chain of Custody

| Possible Hazard Identification | Sample Disposal ( A fee may be assessed if samples are retained longer than 1 month) |
|---|---|
| ☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown | ☐ Return to Client ☑ Disposal By Lab ☐ Archive For ☐ Months |

**Special Instructions/QC Requirements & Comments:**

Submit all results through Cadena at jim.tomalia@cadena.com, Cadena #E203631
Level IV Reporting.

| Relinquished by: | Company: | Date/Time: | Received by: | Company: | Date/Time: |
|---|---|---|---|---|---|
| RACHEL BIELAK Paul Bilak | ARCADIS | 2/26/19 1936 | NOVI COLD STORAGE | ARCADIS | 2/26/19 1936 |
| Caitlin O'Neill | ARCADIS | 02/27/19 14:15 | | TESTAMERICA | 2/27/19 1415 |
| | TESTAMERICA | 2/27/19 1520 | Received in Laboratory by: | Company: | Date/Time: |

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3/14/2019

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

TestAmerica Job ID: 240-108699-1

**Client Sample ID: MW-90S_022619**
**Date Collected: 02/26/19 15:38**
**Date Received: 02/28/19 08:00**

**Lab Sample ID: 240-108699-1**
**Matrix: Water**

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

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|---|---|---|---|---|---|---|---|---|---|
| 1,4-Dioxane | 2.0 | U | 2.0 | 0.86 | ug/L | | | 03/06/19 14:12 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *1,2-Dichloroethane-d4 (Surr)* | *85* | | *63 - 125* | | *03/06/19 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 | | | 03/01/19 19:25 | 1 |
| cis-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.16 | ug/L | | | 03/01/19 19:25 | 1 |
| Tetrachloroethene | 1.0 | U | 1.0 | 0.15 | ug/L | | | 03/01/19 19:25 | 1 |
| trans-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.19 | ug/L | | | 03/01/19 19:25 | 1 |
| Trichloroethene | 1.0 | U | 1.0 | 0.10 | ug/L | | | 03/01/19 19:25 | 1 |
| Vinyl chloride | 1.0 | U | 1.0 | 0.20 | ug/L | | | 03/01/19 19:25 | 1 |

| *Surrogate* | *%Recovery* | *Qualifier* | *Limits* | *Prepared* | *Analyzed* | *Dil Fac* |
|---|---|---|---|---|---|---|
| *1,2-Dichloroethane-d4 (Surr)* | *92* | | *70 - 121* | | *03/01/19 19:25* | *1* |
| *4-Bromofluorobenzene (Surr)* | *66* | | *59 - 120* | | *03/01/19 19:25* | *1* |
| *Toluene-d8 (Surr)* | *73* | | *70 - 123* | | *03/01/19 19:25* | *1* |
| *Dibromofluoromethane (Surr)* | *91* | | *75 - 128* | | *03/01/19 19:25* | *1* |