

ANALYTICAL REPORT

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Laboratory Job ID: 240-112944-1
Client Project/Site: Ford LTP Livonia MI - E203631

For:
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Attn: Kristoffer Hinskey



Authorized for release by:
6/4/2019 2:17:54 PM

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Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

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

Job ID: 240-112944-1

Qualifiers

GC/MS VOA

| Qualifier | Qualifier Description |
|-----------|--|
| U | Indicates the analyte was analyzed for but not detected. |
| X | Surrogate is outside control limits |

Glossary

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

Case Narrative

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

Job ID: 240-112944-1

Job ID: 240-112944-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: Ford LTP Livonia MI - E203631

Report Number: 240-112944-1

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.

Eurofins TestAmerica, Canton attests to the validity of the laboratory data generated by Eurofins TestAmerica facilities reported herein. All analyses performed by Eurofins TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins 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 Eurofins TestAmerica and its client.

RECEIPT

The samples were received on 5/18/2019 10:15 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.4° C.

VOLATILE ORGANIC COMPOUNDS (GCMS)

Samples TRIP BLANK (240-112944-1) and MW-116S_051619 (240-112944-2) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 05/28/2019.

1,2-Dichloroethane-d4 (Surr) and Dibromofluoromethane (Surr) failed the surrogate recovery criteria high for TRIP BLANK (240-112944-1) and MB 240-383285/6.

1,2-Dichloroethane-d4 (Surr) failed the surrogate recovery criteria high for MW-116S_051619 (240-112944-2). Refer to the QC report for details.

Method(s) 8260B: The MS/ MSD for batch 383533 was analyzed outside of the tune time, due to an instrument fault. This is a batch QC sample and not client specific; therefore, the data have been reported. (240-112794-A-7 MS) and (240-112794-A-7 MSD)

Surrogate recovery for the following samples was outside the upper control limit. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed: TRIP BLANK (240-112944-1), MW-116S_051619 (240-112944-2) and (MB

Case Narrative

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

Job ID: 240-112944-1

Job ID: 240-112944-1 (Continued)

Laboratory: Eurofins TestAmerica, Canton (Continued)

240-383285/6).

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-116S_051619 (240-112944-2) was analyzed for volatile organic compounds (GCMS SIM) in accordance with EPA SW-846 Method 8260B SIM. The sample was analyzed on 05/23/2019.

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

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Method Summary

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

Job ID: 240-112944-1

| 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 = Eurofins 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

Job ID: 240-112944-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received | Asset ID |
|---------------|------------------|--------|----------------|----------------|----------|
| 240-112944-1 | TRIP BLANK | Water | 05/16/19 00:00 | 05/20/19 10:15 | |
| 240-112944-2 | MW-116S_051619 | Water | 05/16/19 15:37 | 05/20/19 10:15 | |

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Detection Summary

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

Job ID: 240-112944-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-112944-1

No Detections.

Client Sample ID: MW-116S_051619

Lab Sample ID: 240-112944-2

No Detections.

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This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Canton

Client Sample Results

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

Job ID: 240-112944-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-112944-1

Date Collected: 05/16/19 00:00

Matrix: Water

Date Received: 05/20/19 10:15

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 | | | 05/28/19 21:51 | 1 |
| cis-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.16 | ug/L | | | 05/28/19 21:51 | 1 |
| Tetrachloroethene | 1.0 | U | 1.0 | 0.15 | ug/L | | | 05/28/19 21:51 | 1 |
| trans-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.19 | ug/L | | | 05/28/19 21:51 | 1 |
| Trichloroethene | 1.0 | U | 1.0 | 0.10 | ug/L | | | 05/28/19 21:51 | 1 |
| Vinyl chloride | 1.0 | U | 1.0 | 0.20 | ug/L | | | 05/28/19 21:51 | 1 |

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|------------------------------|-----------|-----------|----------|----------|----------------|---------|
| 1,2-Dichloroethane-d4 (Surr) | 129 | X | 70 - 121 | | 05/28/19 21:51 | 1 |
| 4-Bromofluorobenzene (Surr) | 76 | | 59 - 120 | | 05/28/19 21:51 | 1 |
| Toluene-d8 (Surr) | 101 | | 70 - 123 | | 05/28/19 21:51 | 1 |
| Dibromofluoromethane (Surr) | 129 | X | 75 - 128 | | 05/28/19 21:51 | 1 |

Client Sample Results

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

Job ID: 240-112944-1

Client Sample ID: MW-116S_051619

Lab Sample ID: 240-112944-2

Date Collected: 05/16/19 15:37

Matrix: Water

Date Received: 05/20/19 10:15

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 | | | 05/23/19 14:02 | 1 |

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|------------------------------|-----------|-----------|----------|----------|----------------|---------|
| 1,2-Dichloroethane-d4 (Surr) | 102 | | 63 - 125 | | 05/23/19 14:02 | 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 | | | 05/28/19 22:12 | 1 |
| cis-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.16 | ug/L | | | 05/28/19 22:12 | 1 |
| Tetrachloroethene | 1.0 | U | 1.0 | 0.15 | ug/L | | | 05/28/19 22:12 | 1 |
| trans-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.19 | ug/L | | | 05/28/19 22:12 | 1 |
| Trichloroethene | 1.0 | U | 1.0 | 0.10 | ug/L | | | 05/28/19 22:12 | 1 |
| Vinyl chloride | 1.0 | U | 1.0 | 0.20 | ug/L | | | 05/28/19 22:12 | 1 |

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|------------------------------|-----------|-----------|----------|----------|----------------|---------|
| 1,2-Dichloroethane-d4 (Surr) | 129 | X | 70 - 121 | | 05/28/19 22:12 | 1 |
| 4-Bromofluorobenzene (Surr) | 75 | | 59 - 120 | | 05/28/19 22:12 | 1 |
| Toluene-d8 (Surr) | 101 | | 70 - 123 | | 05/28/19 22:12 | 1 |
| Dibromofluoromethane (Surr) | 125 | | 75 - 128 | | 05/28/19 22:12 | 1 |

Surrogate Summary

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

Job ID: 240-112944-1

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) | | | |
|---------------------|------------------------|--|-----------------|-----------------|------------------|
| | | DCA (70-121) | BFB (59-120) | TOL (70-123) | DBFM (75-128) |
| 240-112863-A-10 MS | Matrix Spike | 113 | 107 | 116 | 110 |
| 240-112863-C-10 MSD | Matrix Spike Duplicate | 109 | 105 | 114 | 105 |
| 240-112944-1 | TRIP BLANK | 129 X | 76 | 101 | 129 X |
| 240-112944-2 | MW-116S_051619 | 129 X | 75 | 101 | 125 |
| LCS 240-383285/4 | Lab Control Sample | 109 | 107 | 114 | 113 |
| MB 240-383285/6 | Method Blank | 144 X | 91 | 117 | 137 X |

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) |
| 240-112944-2 | MW-116S_051619 | 102 |
| 240-112949-A-1 MS | Matrix Spike | 110 |
| 240-112949-A-1 MSD | Matrix Spike Duplicate | 108 |
| LCS 240-382740/4 | Lab Control Sample | 108 |
| MB 240-382740/5 | Method Blank | 107 |

Surrogate Legend

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

QC Sample Results

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

Job ID: 240-112944-1

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

Lab Sample ID: MB 240-383285/6
Matrix: Water
Analysis Batch: 383285

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 | | | 05/28/19 15:39 | 1 |
| cis-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.16 | ug/L | | | 05/28/19 15:39 | 1 |
| Tetrachloroethene | 1.0 | U | 1.0 | 0.15 | ug/L | | | 05/28/19 15:39 | 1 |
| trans-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.19 | ug/L | | | 05/28/19 15:39 | 1 |
| Trichloroethene | 1.0 | U | 1.0 | 0.10 | ug/L | | | 05/28/19 15:39 | 1 |
| Vinyl chloride | 1.0 | U | 1.0 | 0.20 | ug/L | | | 05/28/19 15:39 | 1 |

| Surrogate | MB %Recovery | MB Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|------------------------------|--------------|--------------|----------|----------|----------------|---------|
| 1,2-Dichloroethane-d4 (Surr) | 144 | X | 70 - 121 | | 05/28/19 15:39 | 1 |
| 4-Bromofluorobenzene (Surr) | 91 | | 59 - 120 | | 05/28/19 15:39 | 1 |
| Toluene-d8 (Surr) | 117 | | 70 - 123 | | 05/28/19 15:39 | 1 |
| Dibromofluoromethane (Surr) | 137 | X | 75 - 128 | | 05/28/19 15:39 | 1 |

Lab Sample ID: LCS 240-383285/4
Matrix: Water
Analysis Batch: 383285

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 | 8.44 | | ug/L | | 84 | 65 - 139 |
| cis-1,2-Dichloroethene | 10.0 | 9.78 | | ug/L | | 98 | 76 - 128 |
| Tetrachloroethene | 10.0 | 9.14 | | ug/L | | 91 | 74 - 130 |
| trans-1,2-Dichloroethene | 10.0 | 10.4 | | ug/L | | 104 | 78 - 133 |
| Trichloroethene | 10.0 | 8.41 | | ug/L | | 84 | 76 - 125 |
| Vinyl chloride | 10.0 | 8.94 | | ug/L | | 89 | 58 - 143 |

| Surrogate | LCS %Recovery | LCS Qualifier | Limits |
|------------------------------|---------------|---------------|----------|
| 1,2-Dichloroethane-d4 (Surr) | 109 | | 70 - 121 |
| 4-Bromofluorobenzene (Surr) | 107 | | 59 - 120 |
| Toluene-d8 (Surr) | 114 | | 70 - 123 |
| Dibromofluoromethane (Surr) | 113 | | 75 - 128 |

Lab Sample ID: 240-112863-A-10 MS
Matrix: Water
Analysis Batch: 383285

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 | 1.0 | U | 10.0 | 8.05 | | ug/L | | 80 | 53 - 140 |
| cis-1,2-Dichloroethene | 8.5 | | 10.0 | 17.1 | | ug/L | | 86 | 64 - 130 |
| Tetrachloroethene | 1.0 | U | 10.0 | 8.81 | | ug/L | | 88 | 51 - 136 |
| trans-1,2-Dichloroethene | 1.0 | U | 10.0 | 10.5 | | ug/L | | 105 | 68 - 133 |
| Trichloroethene | 1.0 | U | 10.0 | 7.98 | | ug/L | | 80 | 55 - 131 |
| Vinyl chloride | 6.7 | | 10.0 | 14.6 | | ug/L | | 79 | 43 - 154 |

| Surrogate | MS %Recovery | MS Qualifier | Limits |
|------------------------------|--------------|--------------|----------|
| 1,2-Dichloroethane-d4 (Surr) | 113 | | 70 - 121 |
| 4-Bromofluorobenzene (Surr) | 107 | | 59 - 120 |
| Toluene-d8 (Surr) | 116 | | 70 - 123 |

QC Sample Results

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

Job ID: 240-112944-1

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

Lab Sample ID: 240-112863-A-10 MS
Matrix: Water
Analysis Batch: 383285

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

| Surrogate | MS %Recovery | MS Qualifier | Limits |
|-----------------------------|-----------------|-----------------|----------|
| Dibromofluoromethane (Surr) | 110 | | 75 - 128 |

Lab Sample ID: 240-112863-C-10 MSD
Matrix: Water
Analysis Batch: 383285

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 | 1.0 | U | 10.0 | 7.50 | | ug/L | | 75 | 53 - 140 | 7 | 35 |
| cis-1,2-Dichloroethene | 8.5 | | 10.0 | 16.6 | | ug/L | | 81 | 64 - 130 | 3 | 21 |
| Tetrachloroethene | 1.0 | U | 10.0 | 8.79 | | ug/L | | 88 | 51 - 136 | 0 | 23 |
| trans-1,2-Dichloroethene | 1.0 | U | 10.0 | 9.89 | | ug/L | | 99 | 68 - 133 | 6 | 24 |
| Trichloroethene | 1.0 | U | 10.0 | 7.79 | | ug/L | | 78 | 55 - 131 | 2 | 23 |
| Vinyl chloride | 6.7 | | 10.0 | 13.9 | | ug/L | | 72 | 43 - 154 | 5 | 29 |

| Surrogate | MSD %Recovery | MSD Qualifier | Limits |
|------------------------------|------------------|------------------|----------|
| 1,2-Dichloroethane-d4 (Surr) | 109 | | 70 - 121 |
| 4-Bromofluorobenzene (Surr) | 105 | | 59 - 120 |
| Toluene-d8 (Surr) | 114 | | 70 - 123 |
| Dibromofluoromethane (Surr) | 105 | | 75 - 128 |

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

Lab Sample ID: MB 240-382740/5
Matrix: Water
Analysis Batch: 382740

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 | | | 05/23/19 13:13 | 1 |

| Surrogate | MB %Recovery | MB Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|------------------------------|-----------------|-----------------|----------|----------|----------------|---------|
| 1,2-Dichloroethane-d4 (Surr) | 107 | | 63 - 125 | | 05/23/19 13:13 | 1 |

Lab Sample ID: LCS 240-382740/4
Matrix: Water
Analysis Batch: 382740

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 | 11.1 | | ug/L | | 111 | 59 - 131 |

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

Lab Sample ID: 240-112949-A-1 MS
Matrix: Water
Analysis Batch: 382740

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 |

Eurofins TestAmerica, Canton

QC Sample Results

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

Job ID: 240-112944-1

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

| <i>Surrogate</i> | <i>MS</i> <i>%Recovery</i> | <i>MS</i> <i>Qualifier</i> | <i>Limits</i> |
|------------------------------|-------------------------------|-------------------------------|---------------|
| 1,2-Dichloroethane-d4 (Surr) | 110 | | 63 - 125 |

Lab Sample ID: 240-112949-A-1 MSD
 Matrix: Water
 Analysis Batch: 382740

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

| <i>Analyte</i> | <i>Sample</i> <i>Result</i> | <i>Sample</i> <i>Qualifier</i> | <i>Spike</i> <i>Added</i> | <i>MSD</i> <i>Result</i> | <i>MSD</i> <i>Qualifier</i> | <i>Unit</i> | <i>D</i> | <i>%Rec</i> | <i>%Rec.</i> <i>Limits</i> | <i>RPD</i> | <i>RPD</i> <i>Limit</i> |
|----------------|--------------------------------|-----------------------------------|------------------------------|-----------------------------|--------------------------------|-------------|----------|-------------|-------------------------------|------------|----------------------------|
| 1,4-Dioxane | 2.0 | U | 10.0 | 10.8 | | ug/L | | 108 | 52 - 129 | 5 | 13 |

| <i>Surrogate</i> | <i>MSD</i> <i>%Recovery</i> | <i>MSD</i> <i>Qualifier</i> | <i>Limits</i> |
|------------------------------|--------------------------------|--------------------------------|---------------|
| 1,2-Dichloroethane-d4 (Surr) | 108 | | 63 - 125 |

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QC Association Summary

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

Job ID: 240-112944-1

GC/MS VOA

Analysis Batch: 382740

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|--------------------|------------------------|-----------|--------|-----------|------------|
| 240-112944-2 | MW-116S_051619 | Total/NA | Water | 8260B SIM | |
| MB 240-382740/5 | Method Blank | Total/NA | Water | 8260B SIM | |
| LCS 240-382740/4 | Lab Control Sample | Total/NA | Water | 8260B SIM | |
| 240-112949-A-1 MS | Matrix Spike | Total/NA | Water | 8260B SIM | |
| 240-112949-A-1 MSD | Matrix Spike Duplicate | Total/NA | Water | 8260B SIM | |

Analysis Batch: 383285

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|---------------------|------------------------|-----------|--------|--------|------------|
| 240-112944-1 | TRIP BLANK | Total/NA | Water | 8260B | |
| 240-112944-2 | MW-116S_051619 | Total/NA | Water | 8260B | |
| MB 240-383285/6 | Method Blank | Total/NA | Water | 8260B | |
| LCS 240-383285/4 | Lab Control Sample | Total/NA | Water | 8260B | |
| 240-112863-A-10 MS | Matrix Spike | Total/NA | Water | 8260B | |
| 240-112863-C-10 MSD | Matrix Spike Duplicate | Total/NA | Water | 8260B | |

Lab Chronicle

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

Job ID: 240-112944-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-112944-1

Date Collected: 05/16/19 00:00

Matrix: Water

Date Received: 05/20/19 10:15

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA | Analysis | 8260B | | 1 | 383285 | 05/28/19 21:51 | LRW | TAL CAN |

Client Sample ID: MW-116S_051619

Lab Sample ID: 240-112944-2

Date Collected: 05/16/19 15:37

Matrix: Water

Date Received: 05/20/19 10:15

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA | Analysis | 8260B | | 1 | 383285 | 05/28/19 22:12 | LRW | TAL CAN |
| Total/NA | Analysis | 8260B SIM | | 1 | 382740 | 05/23/19 14:02 | SAM | TAL CAN |

Laboratory References:

TAL CAN = Eurofins 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

Job ID: 240-112944-1


Laboratory: Eurofins 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 * |
| Iowa | State Program | 7 | 421 | 06-01-21 |
| Kansas | NELAP | 7 | E-10336 | 04-30-20 |
| 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 | 03-31-20 |
| 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.

Eurofins TestAmerica, Canton

| | | | | | | | | |
|---|--|--|---|--|--|---|--|--|
| Client Information Client Contact: Caitlin O'Neill Company: ARCADIS U.S. Inc. Address: 28550 Cabot Drive Suite 500 City: Novi State, Zip: MI, 48377 Phone: 248-722-2411 Lab PM: DelMonico, Michael E-Mail: michael.delmonico@testamericainc.com Carrier Tracking No(s): COC No: 240-60548-25803.8 Page: 6 of 13 Job #: 1041 | | | Analysis Requested Due Date Requested: TAT Requested (days): 10 PO #: 41609416-0002-00002-00002-00002 WO #: MIC/HS/0006/0003 Cadena #: E203631 Project #: 24015353 SSO#: | | | Preservation Codes: 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 Other: M - Hexane N - None O - AsNaO2 P - Na2O4S Q - Na2SO3 R - Na2S2O3 S - H2SO4 T - TSP Dodecahydrate U - Acetone V - MCAA W - pH 4.5 X - EDA Z - other (specify) | | |
| Sample Identification Sample Name: Trip blank Site: Ford LTP Sample Time: 5/16/19 1537 Sample Type (C=Comp, G=grab): 6 Matrix (Water, S-solid, O-liquid, BT=Tealoc, A=Air) | | | Field Filtered Sample (Yes or No) X Perform MS/MSD (Yes or No) A A 8260B, 8260B SIM X 8260B - VOCs (Short List) X X X Total Number of containers: 1 Trip Blank Special Instructions/Note: 6  | | | | | |
| Possible Hazard Identification <input checked="" type="checkbox"/> Non-Hazard <input type="checkbox"/> Flammable <input type="checkbox"/> Skin Irritant <input type="checkbox"/> Poison B <input type="checkbox"/> Unknown <input type="checkbox"/> Radiological Deliverable Requested: I, II, III, IV, Other (specify) | | | | | | | | |
| Empty Kit Relinquished by: _____ Date: _____ Relinquished by: <i>Steph Turner</i> Date: 5/16/19 / 1830 Company: Arcadis Relinquished by: <i>Caitlin O'Neill</i> Date: 5/17/19 1200 Company: Arcadis Relinquished by: <i>[Signature]</i> Date: 5-17-19 1530 Company: ETA Custody Seals Intact Custody Seal No.: Cooler Temperature(s) °C and Other Remarks: | | | | | | | | |

TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 112944

Client Arcadis Site Name _____
 Cooler Received on 5-18-19 Opened on 5-18-19

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 # TA 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. 1.6 °C Corrected Cooler Temp. 1.4 °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# HC984738
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: _____

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: _____

DATA VERIFICATION REPORT



June 4, 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

Event Specific Scope of Work References: Sample COC

Laboratory: TestAmerica - North Canton

Laboratory submittal: 112944-1

Sample date: 2019-05-15

Report received by CADENA: 2019-06-04

Initial Data Verification completed by CADENA: 2019-06-04

Number of Samples:2

Sample Matrices: Water

Test Categories: GCMS VOC

Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC sample -001, trip blank and the method blank SURROGATE recoveries were outliers biased high for at least 1 surrogate. Associated client sample results were non-detect so qualification was not required based on these high bias QC outliers.

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.

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.

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 Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

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: 112944-1

| 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 |
|---------------|----------------|-------------------------------|-------------------------------|------------------------------|-------------------------------------|---------|
| 2401129441 | TRIP BLANK | 5/16/2019 | 12:00:00 | X | | |
| 2401129442 | MW-116S_051619 | 5/16/2019 | 3:37:00 | X | X | |

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631

Laboratory: TestAmerica - North Canton

Laboratory Submittal: 112944-1

Sample Name: TRIP BLANK MW-116S_051619
Lab Sample ID: 2401129441 2401129442
Sample Date: 5/16/2019 5/16/2019

| Analyte | Cas No. | Report | | Units | Valid | | Report | | Valid | |
|--------------------------|----------|--------|-------|-------|-----------|--------|--------|-------|-----------|--|
| | | Result | Limit | | Qualifier | Result | Limit | Units | Qualifier | |
| GC/MS VOC | | | | | | | | | | |
| <u>OSW-8260B</u> | | | | | | | | | | |
| 1,1-Dichloroethene | 75-35-4 | ND | 1.0 | ug/l | --- | ND | 1.0 | ug/l | --- | |
| cis-1,2-Dichloroethene | 156-59-2 | ND | 1.0 | ug/l | --- | ND | 1.0 | ug/l | --- | |
| Tetrachloroethene | 127-18-4 | ND | 1.0 | ug/l | --- | ND | 1.0 | ug/l | --- | |
| trans-1,2-Dichloroethene | 156-60-5 | ND | 1.0 | ug/l | --- | ND | 1.0 | ug/l | --- | |
| Trichloroethene | 79-01-6 | ND | 1.0 | ug/l | --- | ND | 1.0 | ug/l | --- | |
| Vinyl chloride | 75-01-4 | ND | 1.0 | ug/l | --- | ND | 1.0 | ug/l | --- | |
| <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 #240-112944-1

CADENA Verification Report: 2019-06-04

Analyses Performed By:

TestAmerica
Canton, Ohio

Report #33128R

Review Level: Tier III

Project: MI001454.0004.00002



DATA REVIEW

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-112944-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. 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 (Full Scan) | VOC (SIM) | MISC |
| 240-112944-1 | TRIP BLANK | 240-112944-1 | Water | 5/16/2019 | | X | | |
| | MW-116S_051619 | 240-112944-2 | Water | 5/16/2019 | | X | X | |

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. Holding Times

The specified holding times for the following methods are presented in the following table.

| Method | Matrix | Holding Time | Preservation |
|---------------------------|--------|-------------------------------------|------------------------------------|
| SW-846 8260B/8260B-SIM | Water | 14 days from collection to analysis | Cool to < 6 °C; pH < 2 with HCl |

All samples were analyzed within the specified holding time criteria.

2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

3. 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.

3.1 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 (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

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

3.2 Continuing Calibration

All target compounds associated with the continuing calibration 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.

4. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

DATA REVIEW

All identified compounds met the specified criteria.

6. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in 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 | |
| GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS) | | | | | |
| Tier II Validation | | | | | |
| Holding times/Preservation | | X | | X | |
| Tier III Validation | | | | | |
| System performance and column resolution | | X | | X | |
| Initial calibration %RSDs | | X | | X | |
| Continuing calibration RRFs | | X | | X | |
| Continuing calibration %Ds | | X | | X | |
| Instrument tune and performance check | | X | | X | |
| Ion abundance criteria for each instrument used | | X | | X | |
| Internal standard | | 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 | |
| D. Transcription/calculation errors present | | X | | X | |
| E. Reporting limits adjusted to reflect sample dilutions | | X | | X | |

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Andrew Korycinski

SIGNATURE:



DATE: June 14, 2019

PEER REVIEW: Dennis Capria

DATE: June 26, 2019



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



Client Sample Results

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

Job ID: 240-112944-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-112944-1

Date Collected: 05/16/19 00:00

Matrix: Water

Date Received: 05/20/19 10:15

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 | | | 05/28/19 21:51 | 1 |
| cis-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.16 | ug/L | | | 05/28/19 21:51 | 1 |
| Tetrachloroethene | 1.0 | U | 1.0 | 0.15 | ug/L | | | 05/28/19 21:51 | 1 |
| trans-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.19 | ug/L | | | 05/28/19 21:51 | 1 |
| Trichloroethene | 1.0 | U | 1.0 | 0.10 | ug/L | | | 05/28/19 21:51 | 1 |
| Vinyl chloride | 1.0 | U | 1.0 | 0.20 | ug/L | | | 05/28/19 21:51 | 1 |

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|------------------------------|-----------|-----------|----------|----------|----------------|---------|
| 1,2-Dichloroethane-d4 (Surr) | 129 | X | 70 - 121 | | 05/28/19 21:51 | 1 |
| 4-Bromofluorobenzene (Surr) | 76 | | 59 - 120 | | 05/28/19 21:51 | 1 |
| Toluene-d8 (Surr) | 101 | | 70 - 123 | | 05/28/19 21:51 | 1 |
| Dibromofluoromethane (Surr) | 129 | X | 75 - 128 | | 05/28/19 21:51 | 1 |

Client Sample Results

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

Job ID: 240-112944-1

Client Sample ID: MW-116S_051619

Lab Sample ID: 240-112944-2

Date Collected: 05/16/19 15:37

Matrix: Water

Date Received: 05/20/19 10:15

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 | | | 05/23/19 14:02 | 1 |

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|------------------------------|-----------|-----------|----------|----------|----------------|---------|
| 1,2-Dichloroethane-d4 (Surr) | 102 | | 63 - 125 | | 05/23/19 14:02 | 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 | | | 05/28/19 22:12 | 1 |
| cis-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.16 | ug/L | | | 05/28/19 22:12 | 1 |
| Tetrachloroethene | 1.0 | U | 1.0 | 0.15 | ug/L | | | 05/28/19 22:12 | 1 |
| trans-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.19 | ug/L | | | 05/28/19 22:12 | 1 |
| Trichloroethene | 1.0 | U | 1.0 | 0.10 | ug/L | | | 05/28/19 22:12 | 1 |
| Vinyl chloride | 1.0 | U | 1.0 | 0.20 | ug/L | | | 05/28/19 22:12 | 1 |

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|------------------------------|-----------|-----------|----------|----------|----------------|---------|
| 1,2-Dichloroethane-d4 (Surr) | 129 | X | 70 - 121 | | 05/28/19 22:12 | 1 |
| 4-Bromofluorobenzene (Surr) | 75 | | 59 - 120 | | 05/28/19 22:12 | 1 |
| Toluene-d8 (Surr) | 101 | | 70 - 123 | | 05/28/19 22:12 | 1 |
| Dibromofluoromethane (Surr) | 125 | | 75 - 128 | | 05/28/19 22:12 | 1 |