

ANALYTICAL REPORT

Eurofins TestAmerica, Canton
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North Canton, OH 44720
Tel: (330)497-9396

Laboratory Job ID: 240-144569-1
Client Project/Site: Ford LTP - Off Site

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

Attn: Kristoffer Hinskey



Authorized for release by:
2/28/2021 1:59:52 PM

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

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



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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144569-1

Qualifiers

GC/MS VOA

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

Glossary

| Abbreviation | These commonly used abbreviations may or may not be present in this report. |
|----------------|---|
| α | Listed under the "D" column to designate that the result is reported on a dry weight basis |
| %R | Percent Recovery |
| CFL | Contains Free Liquid |
| CFU | Colony Forming Unit |
| 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) |
| MCL | EPA recommended "Maximum Contaminant Level" |
| MDA | Minimum Detectable Activity (Radiochemistry) |
| MDC | Minimum Detectable Concentration (Radiochemistry) |
| MDL | Method Detection Limit |
| ML | Minimum Level (Dioxin) |
| MPN | Most Probable Number |
| MQL | Method Quantitation Limit |
| NC | Not Calculated |
| ND | Not Detected at the reporting limit (or MDL or EDL if shown) |
| NEG | Negative / Absent |
| POS | Positive / Present |
| PQL | Practical Quantitation Limit |
| PRES | Presumptive |
| 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) |
| TNTC | Too Numerous To Count |

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144569-1

Job ID: 240-144569-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

Job Narrative
240-144569-1

Comments

No additional comments.

Receipt

The samples were received on 2/17/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.1° C.

GC/MS VOA

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

VOA Prep

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

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Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144569-1

| 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 - Off Site

Job ID: 240-144569-1

| Lab Sample ID | Client Sample ID | Matrix | Collected | Received | Asset ID |
|---------------|------------------|--------|----------------|----------------|----------|
| 240-144569-1 | TRIP BLANK | Water | 02/12/21 00:00 | 02/17/21 08:00 | |
| 240-144569-2 | MW-95S_021221 | Water | 02/12/21 13:10 | 02/17/21 08:00 | |

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Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144569-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144569-1

No Detections.

Client Sample ID: MW-95S_021221

Lab Sample ID: 240-144569-2

| Analyte | Result | Qualifier | RL | MDL | Unit | Dil Fac | D | Method | Prep Type |
|------------------------|--------|-----------|-----|------|------|---------|---|--------|-----------|
| cis-1,2-Dichloroethene | 0.17 | J | 1.0 | 0.16 | ug/L | 1 | | 8260B | Total/NA |

This Detection Summary does not include radiochemical test results.

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Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP - Off Site

Job ID: 240-144569-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144569-1

Date Collected: 02/12/21 00:00

Matrix: Water

Date Received: 02/17/21 08:00

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

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|--------------------------|--------|-----------|-----|------|------|---|----------|----------------|---------|
| 1,1-Dichloroethene | 1.0 | U | 1.0 | 0.19 | ug/L | | | 02/23/21 13:02 | 1 |
| cis-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.16 | ug/L | | | 02/23/21 13:02 | 1 |
| Tetrachloroethene | 1.0 | U | 1.0 | 0.15 | ug/L | | | 02/23/21 13:02 | 1 |
| trans-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.19 | ug/L | | | 02/23/21 13:02 | 1 |
| Trichloroethene | 1.0 | U | 1.0 | 0.10 | ug/L | | | 02/23/21 13:02 | 1 |
| Vinyl chloride | 1.0 | U | 1.0 | 0.20 | ug/L | | | 02/23/21 13:02 | 1 |

| Surrogate | %Recovery | Qualifier | Limits | Prepared | Analyzed | Dil Fac |
|------------------------------|-----------|-----------|----------|----------|----------------|---------|
| 1,2-Dichloroethane-d4 (Surr) | 103 | | 75 - 130 | | 02/23/21 13:02 | 1 |
| 4-Bromofluorobenzene (Surr) | 94 | | 47 - 134 | | 02/23/21 13:02 | 1 |
| Toluene-d8 (Surr) | 104 | | 69 - 122 | | 02/23/21 13:02 | 1 |
| Dibromofluoromethane (Surr) | 101 | | 78 - 129 | | 02/23/21 13:02 | 1 |

Client Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP - Off Site

Job ID: 240-144569-1

Client Sample ID: MW-95S_021221

Lab Sample ID: 240-144569-2

Date Collected: 02/12/21 13:10

Matrix: Water

Date Received: 02/17/21 08:00

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

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|------------------------------|------------------|------------------|---------------|------|------|---|-----------------|-----------------|----------------|
| 1,4-Dioxane | 2.0 | U | 2.0 | 0.86 | ug/L | | | 02/22/21 17:26 | 1 |
| Surrogate | %Recovery | Qualifier | Limits | | | | Prepared | Analyzed | Dil Fac |
| 1,2-Dichloroethane-d4 (Surr) | 83 | | 70 - 133 | | | | | 02/22/21 17:26 | 1 |

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

| Analyte | Result | Qualifier | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|-------------------------------|------------------|------------------|---------------|------|------|---|-----------------|-----------------|----------------|
| 1,1-Dichloroethene | 1.0 | U | 1.0 | 0.19 | ug/L | | | 02/23/21 13:24 | 1 |
| cis-1,2-Dichloroethene | 0.17 | J | 1.0 | 0.16 | ug/L | | | 02/23/21 13:24 | 1 |
| Tetrachloroethene | 1.0 | U | 1.0 | 0.15 | ug/L | | | 02/23/21 13:24 | 1 |
| trans-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.19 | ug/L | | | 02/23/21 13:24 | 1 |
| Trichloroethene | 1.0 | U | 1.0 | 0.10 | ug/L | | | 02/23/21 13:24 | 1 |
| Vinyl chloride | 1.0 | U | 1.0 | 0.20 | ug/L | | | 02/23/21 13:24 | 1 |
| Surrogate | %Recovery | Qualifier | Limits | | | | Prepared | Analyzed | Dil Fac |
| 1,2-Dichloroethane-d4 (Surr) | 102 | | 75 - 130 | | | | | 02/23/21 13:24 | 1 |
| 4-Bromofluorobenzene (Surr) | 87 | | 47 - 134 | | | | | 02/23/21 13:24 | 1 |
| Toluene-d8 (Surr) | 96 | | 69 - 122 | | | | | 02/23/21 13:24 | 1 |
| Dibromofluoromethane (Surr) | 99 | | 78 - 129 | | | | | 02/23/21 13:24 | 1 |

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144569-1

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

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

| Lab Sample ID | Client Sample ID | DCA (75-130) | BFB (47-134) | TOL (69-122) | DBFM (78-129) |
|--------------------|------------------------|-----------------|-----------------|-----------------|------------------|
| 240-144569-1 | TRIP BLANK | 103 | 94 | 104 | 101 |
| 240-144569-2 | MW-95S_021221 | 102 | 87 | 96 | 99 |
| 240-144576-D-2 MS | Matrix Spike | 97 | 96 | 103 | 97 |
| 240-144576-E-2 MSD | Matrix Spike Duplicate | 95 | 93 | 98 | 97 |
| LCS 240-474092/4 | Lab Control Sample | 101 | 103 | 105 | 109 |
| MB 240-474092/6 | Method Blank | 98 | 87 | 101 | 98 |

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 (70-133) |
|--------------------|------------------------|-----------------|
| 240-144518-M-2 MS | Matrix Spike | 84 |
| 240-144518-M-2 MSD | Matrix Spike Duplicate | 84 |
| 240-144569-2 | MW-95S_021221 | 83 |
| LCS 240-473970/4 | Lab Control Sample | 80 |
| MB 240-473970/5 | Method Blank | 81 |

Surrogate Legend

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

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144569-1

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

Lab Sample ID: MB 240-474092/6
Matrix: Water
Analysis Batch: 474092

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

| Analyte | MB MB | | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|--------------------------|--------|-----------|-----|------|------|---|----------|----------------|---------|
| | Result | Qualifier | | | | | | | |
| 1,1-Dichloroethene | 1.0 | U | 1.0 | 0.19 | ug/L | | | 02/23/21 11:10 | 1 |
| cis-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.16 | ug/L | | | 02/23/21 11:10 | 1 |
| Tetrachloroethene | 1.0 | U | 1.0 | 0.15 | ug/L | | | 02/23/21 11:10 | 1 |
| trans-1,2-Dichloroethene | 1.0 | U | 1.0 | 0.19 | ug/L | | | 02/23/21 11:10 | 1 |
| Trichloroethene | 1.0 | U | 1.0 | 0.10 | ug/L | | | 02/23/21 11:10 | 1 |
| Vinyl chloride | 1.0 | U | 1.0 | 0.20 | ug/L | | | 02/23/21 11:10 | 1 |

| Surrogate | MB MB | | Limits | Prepared | Analyzed | Dil Fac |
|------------------------------|-----------|-----------|----------|----------|----------------|---------|
| | %Recovery | Qualifier | | | | |
| 1,2-Dichloroethane-d4 (Surr) | 98 | | 75 - 130 | | 02/23/21 11:10 | 1 |
| 4-Bromofluorobenzene (Surr) | 87 | | 47 - 134 | | 02/23/21 11:10 | 1 |
| Toluene-d8 (Surr) | 101 | | 69 - 122 | | 02/23/21 11:10 | 1 |
| Dibromofluoromethane (Surr) | 98 | | 78 - 129 | | 02/23/21 11:10 | 1 |

Lab Sample ID: LCS 240-474092/4
Matrix: Water
Analysis Batch: 474092

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

| Analyte | Spike Added | LCS LCS | | Unit | D | %Rec | %Rec. Limits |
|--------------------------|-------------|---------|-----------|------|---|------|--------------|
| | | Result | Qualifier | | | | |
| 1,1-Dichloroethene | 10.0 | 10.9 | | ug/L | | 109 | 73 - 129 |
| cis-1,2-Dichloroethene | 10.0 | 10.8 | | ug/L | | 108 | 75 - 124 |
| Tetrachloroethene | 10.0 | 11.7 | | ug/L | | 117 | 70 - 125 |
| trans-1,2-Dichloroethene | 10.0 | 10.6 | | ug/L | | 106 | 74 - 130 |
| Trichloroethene | 10.0 | 10.4 | | ug/L | | 104 | 71 - 121 |
| Vinyl chloride | 10.0 | 11.4 | | ug/L | | 114 | 61 - 134 |

| Surrogate | LCS LCS | | Limits |
|------------------------------|-----------|-----------|----------|
| | %Recovery | Qualifier | |
| 1,2-Dichloroethane-d4 (Surr) | 101 | | 75 - 130 |
| 4-Bromofluorobenzene (Surr) | 103 | | 47 - 134 |
| Toluene-d8 (Surr) | 105 | | 69 - 122 |
| Dibromofluoromethane (Surr) | 109 | | 78 - 129 |

Lab Sample ID: 240-144576-D-2 MS
Matrix: Water
Analysis Batch: 474092

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

| Analyte | Sample Sample | | Spike Added | MS MS | | Unit | D | %Rec | %Rec. Limits |
|--------------------------|---------------|-----------|-------------|--------|-----------|------|---|------|--------------|
| | Result | Qualifier | | Result | Qualifier | | | | |
| 1,1-Dichloroethene | 1.0 | U | 10.0 | 9.00 | | ug/L | | 90 | 64 - 132 |
| cis-1,2-Dichloroethene | 1.0 | U | 10.0 | 9.45 | | ug/L | | 95 | 68 - 121 |
| Tetrachloroethene | 1.0 | U | 10.0 | 8.55 | | ug/L | | 85 | 52 - 129 |
| trans-1,2-Dichloroethene | 1.0 | U | 10.0 | 9.17 | | ug/L | | 92 | 69 - 126 |
| Trichloroethene | 1.0 | U | 10.0 | 9.03 | | ug/L | | 90 | 56 - 124 |
| Vinyl chloride | 1.0 | U | 10.0 | 9.58 | | ug/L | | 96 | 49 - 136 |

| Surrogate | MS MS | | Limits |
|------------------------------|-----------|-----------|----------|
| | %Recovery | Qualifier | |
| 1,2-Dichloroethane-d4 (Surr) | 97 | | 75 - 130 |
| 4-Bromofluorobenzene (Surr) | 96 | | 47 - 134 |
| Toluene-d8 (Surr) | 103 | | 69 - 122 |

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QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144569-1

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

Lab Sample ID: 240-144576-D-2 MS
Matrix: Water
Analysis Batch: 474092

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

| Surrogate | MS MS | | Limits |
|-----------------------------|-----------|-----------|----------|
| | %Recovery | Qualifier | |
| Dibromofluoromethane (Surr) | 97 | | 78 - 129 |

Lab Sample ID: 240-144576-E-2 MSD
Matrix: Water
Analysis Batch: 474092

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

| Analyte | Sample Result | Sample Qualifier | Spike Added | MSD MSD | | Unit | D | %Rec | %Rec. Limits | RPD | RPD Limit |
|--------------------------|---------------|------------------|-------------|---------|-----------|------|---|------|--------------|-----|-----------|
| | | | | Result | Qualifier | | | | | | |
| 1,1-Dichloroethene | 1.0 | U | 10.0 | 9.58 | | ug/L | | 96 | 64 - 132 | 6 | 35 |
| cis-1,2-Dichloroethene | 1.0 | U | 10.0 | 9.91 | | ug/L | | 99 | 68 - 121 | 5 | 35 |
| Tetrachloroethene | 1.0 | U | 10.0 | 10.1 | | ug/L | | 101 | 52 - 129 | 17 | 35 |
| trans-1,2-Dichloroethene | 1.0 | U | 10.0 | 9.82 | | ug/L | | 98 | 69 - 126 | 7 | 35 |
| Trichloroethene | 1.0 | U | 10.0 | 10.2 | | ug/L | | 102 | 56 - 124 | 12 | 35 |
| Vinyl chloride | 1.0 | U | 10.0 | 10.5 | | ug/L | | 105 | 49 - 136 | 9 | 35 |

| Surrogate | MSD MSD | | Limits |
|------------------------------|-----------|-----------|----------|
| | %Recovery | Qualifier | |
| 1,2-Dichloroethane-d4 (Surr) | 95 | | 75 - 130 |
| 4-Bromofluorobenzene (Surr) | 93 | | 47 - 134 |
| Toluene-d8 (Surr) | 98 | | 69 - 122 |
| Dibromofluoromethane (Surr) | 97 | | 78 - 129 |

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

Lab Sample ID: MB 240-473970/5
Matrix: Water
Analysis Batch: 473970

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

| Analyte | MB MB | | RL | MDL | Unit | D | Prepared | Analyzed | Dil Fac |
|-------------|--------|-----------|-----|------|------|---|----------------|----------|---------|
| | Result | Qualifier | | | | | | | |
| 1,4-Dioxane | 2.0 | U | 2.0 | 0.86 | ug/L | | 02/22/21 14:03 | | 1 |

| Surrogate | MB MB | | Limits | Prepared | Analyzed | Dil Fac |
|------------------------------|-----------|-----------|----------|----------|----------------|---------|
| | %Recovery | Qualifier | | | | |
| 1,2-Dichloroethane-d4 (Surr) | 81 | | 70 - 133 | | 02/22/21 14:03 | 1 |

Lab Sample ID: LCS 240-473970/4
Matrix: Water
Analysis Batch: 473970

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

| Analyte | Spike Added | LCS LCS | | Unit | D | %Rec | %Rec. Limits |
|-------------|-------------|---------|-----------|------|---|------|--------------|
| | | Result | Qualifier | | | | |
| 1,4-Dioxane | 10.0 | 10.3 | | ug/L | | 103 | 80 - 135 |

| Surrogate | LCS LCS | | Limits |
|------------------------------|-----------|-----------|----------|
| | %Recovery | Qualifier | |
| 1,2-Dichloroethane-d4 (Surr) | 80 | | 70 - 133 |

Lab Sample ID: 240-144518-M-2 MS
Matrix: Water
Analysis Batch: 473970

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

| Analyte | Sample Result | Sample Qualifier | Spike Added | MS MS | | Unit | D | %Rec | %Rec. Limits |
|-------------|---------------|------------------|-------------|--------|-----------|------|---|------|--------------|
| | | | | Result | Qualifier | | | | |
| 1,4-Dioxane | 2.0 | U | 10.0 | 10.3 | | ug/L | | 103 | 46 - 170 |

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QC Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP - Off Site

Job ID: 240-144569-1

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) | 84 | | 70 - 133 |

Lab Sample ID: 240-144518-M-2 MSD
Matrix: Water
Analysis Batch: 473970

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 | 10.4 | | ug/L | | 104 | 46 - 170 | 1 | 26 |

| <i>Surrogate</i> | <i>MSD</i> <i>%Recovery</i> | <i>MSD</i> <i>Qualifier</i> | <i>Limits</i> |
|------------------------------|--------------------------------|--------------------------------|---------------|
| 1,2-Dichloroethane-d4 (Surr) | 84 | | 70 - 133 |

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QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144569-1

GC/MS VOA

Analysis Batch: 473970

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|--------------------|------------------------|-----------|--------|-----------|------------|
| 240-144569-2 | MW-95S_021221 | Total/NA | Water | 8260B SIM | |
| MB 240-473970/5 | Method Blank | Total/NA | Water | 8260B SIM | |
| LCS 240-473970/4 | Lab Control Sample | Total/NA | Water | 8260B SIM | |
| 240-144518-M-2 MS | Matrix Spike | Total/NA | Water | 8260B SIM | |
| 240-144518-M-2 MSD | Matrix Spike Duplicate | Total/NA | Water | 8260B SIM | |

Analysis Batch: 474092

| Lab Sample ID | Client Sample ID | Prep Type | Matrix | Method | Prep Batch |
|--------------------|------------------------|-----------|--------|--------|------------|
| 240-144569-1 | TRIP BLANK | Total/NA | Water | 8260B | |
| 240-144569-2 | MW-95S_021221 | Total/NA | Water | 8260B | |
| MB 240-474092/6 | Method Blank | Total/NA | Water | 8260B | |
| LCS 240-474092/4 | Lab Control Sample | Total/NA | Water | 8260B | |
| 240-144576-D-2 MS | Matrix Spike | Total/NA | Water | 8260B | |
| 240-144576-E-2 MSD | Matrix Spike Duplicate | Total/NA | Water | 8260B | |

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP - Off Site

Job ID: 240-144569-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-144569-1

Date Collected: 02/12/21 00:00

Matrix: Water

Date Received: 02/17/21 08:00

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA | Analysis | 8260B | | 1 | 474092 | 02/23/21 13:02 | LEE | TAL CAN |

Client Sample ID: MW-95S_021221

Lab Sample ID: 240-144569-2

Date Collected: 02/12/21 13:10

Matrix: Water

Date Received: 02/17/21 08:00

| Prep Type | Batch Type | Batch Method | Run | Dilution Factor | Batch Number | Prepared or Analyzed | Analyst | Lab |
|-----------|------------|--------------|-----|-----------------|--------------|----------------------|---------|---------|
| Total/NA | Analysis | 8260B | | 1 | 474092 | 02/23/21 13:24 | LEE | TAL CAN |
| Total/NA | Analysis | 8260B SIM | | 1 | 473970 | 02/22/21 17:26 | 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 - Off Site

Job ID: 240-144569-1

Laboratory: Eurofins TestAmerica, Canton

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

| Authority | Program | Identification Number | Expiration Date |
|-----------------------|---------------------|-----------------------|-----------------|
| California | State | 2927 | 02-23-21 |
| Connecticut | State | PH-0590 | 12-31-21 |
| Florida | NELAP | E87225 | 06-30-21 |
| Georgia | State | 4062 | 02-23-21 |
| Illinois | NELAP | 004498 | 07-31-21 |
| Iowa | State | 421 | 06-01-21 |
| Kansas | NELAP | E-10336 | 04-30-21 |
| Kentucky (UST) | State | 112225 | 02-23-21 |
| Kentucky (WW) | State | KY98016 | 12-31-21 |
| Minnesota | NELAP | OH00048 | 12-31-21 |
| Minnesota (Petrofund) | State | 3506 | 08-01-21 |
| New Jersey | NELAP | OH001 | 06-30-21 |
| New York | NELAP | 10975 | 03-31-21 |
| Ohio VAP | State | CL0024 | 12-21-23 |
| Oregon | NELAP | 4062 | 02-24-21 |
| Pennsylvania | NELAP | 68-00340 | 08-31-21 |
| Texas | NELAP | T104704517-18-10 | 08-31-21 |
| USDA | US Federal Programs | P330-18-00281 | 09-17-21 |
| Virginia | NELAP | 010101 | 09-14-21 |
| Washington | State | C971 | 01-12-22 |
| West Virginia DEP | State | 210 | 12-31-21 |

Chain of Custody Record

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

Regulatory program: NPDES RCRA Other

Client Project Manager: Kris Hinskey
 Telephone: 248-994-2240
 Email: kristoffer.hinskey@arcadis.com

Site Contact: Julia McClafferty
 Telephone: 734-644-5131

Company Name: Arcadis
 Address: 28550 Cabot Drive, Suite 500
 City/State/Zip: Novi, MI, 48377
 Phone: 248-994-2240
 Project Name: Ford LTP Off-Site
 Project Number: 30050315.402.04
 PO # 30050315.402.04

Sampler Name: Emma Witherspoon
 Method of Shipment/Carrier:
 Shipping/Tracking No:

| Sample Identification | Sample Date | Sample Time | Matrix | | | | Containers & Preservatives | | | | Filtered Sample (Y/N) | Composite=C/Grab=G | Analyses | | | | | | | Sample Specific Notes / Special Instructions | | | | | | |
|-----------------------|-------------|-------------|--------|---------|----------|-------|----------------------------|-------|------|-----|-----------------------|--------------------|----------|------|------|--------|---------------|-------------------|---------------------|--|-----------|-----------|----------------------|-----------------------|--------------|--|
| | | | Air | Aqueous | Sediment | Solid | Other: | H2SO4 | HNO3 | HCl | | | NaOH | ZnAc | NaOH | Other: | 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 | | |
| TRIP BLANK | | | | | | | | | | | | | | | | | | | | | | | | | 1 TRIP blank | |
| MMW-955-021221 | 2/12/21 | 1310 | | | | | | | | | | | | | | | | | | | | | | | | 3 UCCS for 8260B 3 UCCS for 8260B SIM |



Possible Hazard Identification
 Non-Hazard Flammable Irritant Poison B Unknown

Sample Disposal (A Fee may be assessed if samples are retained longer than 1 month)
 Return to Client Disposal By: Lab Archive For: _____ Months

Special Instructions/QC Requirements & Comments:
 Submit all results through Cadena at jtomatia@cadenaco.com. Cadena #E203631
 Level IV Reporting requested.

Relinquished by: *Justin Weese* Company: Arcadis Date/Time: 2/12/21 / 1700
 Relinquished by: *Christina Utter* Company: ARCADIS Date/Time: 2/15/21 / 1010
 Relinquished by: *Amanda Patterson* Company: ETA Date/Time: 2/15/21 10:57

Received by: *NOVI cold storage* Company: Arcadis Date/Time: 2/12/21 / 1700
 Reported by: *Amanda Patterson* Company: ETA Date/Time: 2/15/21 / 1010
 Received in Laboratory by: *ETA* Company: ETA Date/Time: 2/15/21 10:57

ETA 2/16/21 907
ETA 2-17-21 800
 COLD STORAGE ETA 2/15/21 10:57

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

Login # : 144569

Client Arcadis Site Name _____
Cooler Received on 2-17-21 Opened on 2-17-21
FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

Cooler unpacked by:
Matt Snyder

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-11 (CF +0.1 °C) Observed Cooler Temp. 1.0 °C Corrected Cooler Temp. 1.1 °C
IR GUN #IR-12 (CF +0.2 °C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
 2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity _____ 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 (ID/Date/Time) be reconciled with the COC? Yes No
 9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)? Yes No
 10. Were correct bottle(s) used for the test(s) indicated? Yes No
 11. Sufficient quantity received to perform indicated analyses? Yes No
 12. Are these work share samples and all listed on the COC? Yes No
- If yes, Questions 13-17 have been checked at the originating laboratory.
13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC907861
 14. Were VOAs on the COC? Yes No
 15. Were air bubbles >6 mm in any VOA vials? Yes NA ← Larger than this.
 16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # _____ Yes No
 17. 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 _____

18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES additional next page

Samples processed by: _____

19. 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)

20. 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



February 28, 2021

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: 30050315.402.04 off site
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - North Canton
Laboratory submittal: 144569-1
Sample date: 2021-02-12
Report received by CADENA: 2021-02-28
Initial Data Verification completed by CADENA: 2021-02-28
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.

There were no significant QC anomalies or exceptions to report.

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.

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 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. |

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631

Laboratory: TestAmerica - North Canton

Laboratory Submittal: 144569-1

Sample Name: TRIP BLANK MW-95S_021221
Lab Sample ID: 2401445691 2401445692
Sample Date: 2/12/2021 2/12/2021

| Analyte | Cas No. | Report | | | Valid | | |
|--------------------------|----------|--------|-------|-------|--------|-------|-------|
| | | Result | Limit | Units | Result | Limit | Units |
| 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 | 0.17 | 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 |
| 1,4-Dioxane | 123-91-1 | ND | 2.0 | ug/l | ND | 2.0 | ug/l |

GC/MS VOC

OSW-8260B

| | | | | | | | |
|--------------------------|----------|----|-----|------|------|-----|------|
| 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 | 0.17 | 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 |

OSW-8260BBSim

| | | | | | | | |
|-------------|----------|----|-----|------|----|-----|------|
| 1,4-Dioxane | 123-91-1 | ND | 2.0 | ug/l | ND | 2.0 | ug/l |
|-------------|----------|----|-----|------|----|-----|------|



SHALLOW LOW-FLOW GROUNDWATER SAMPLING FORM

Page 1 of 1

Project No. 30050315.402.01 Well ID _____ MW-95S Date 2-12-21

Project Name/Location Ford LTP Weather 17.6 degrees F and . The wind is blowing N/NE at 9.2 mph.

Measuring Pt. Description Top of Casing Screen Setting (ft-bmp) 2.5-12.5 Casing Diameter (in.) 2 Well Material PVC

Static Water Level (ft-bmp) 4.88 Total Depth (ft-bmp) 12.00 Water Column (ft.) 7.12 Gallons in Well 1.16

Pump Intake (ft-bmp) 6.38 Purge Method Low-Flow Sample Method Grab

Well Volumes Purged 1.34

Sample Time: Label 13:10 Volume Purged 1.56 gallons Replicate/Code No. -- Sampled by Emma Witherspoon

Purge Start 12:07

Purge End 13:14

Emma Witherspoon

| Time | Minutes Elapsed between Readings | Flow Rate (mL/min) [100-300 mL/min] | Depth to Water (ft) [±0.3] | Total Gallons Purged | pH [±0.1] | Cond. (mS/cm) [±3%] | Turbidity (NTU) [±10%*] | DO (mg/L) [±10%] | Temp. (°C) [±3%] | Redox (mV) [±10mV] | Appearance | |
|-------|----------------------------------|-------------------------------------|----------------------------|----------------------|-----------|---------------------|-------------------------|------------------|------------------|--------------------|------------|---------|
| | | | | | | | | | | | Color | Odor |
| 12:10 | 0 | 100 | 4.90 | 0.00 | 7.41 | 1.19 | 0.02 | 3.97 | 5.8 | -90.4 | Clear | No Odor |
| 12:15 | 5 | 100 | 4.90 | 0.13 | 6.75 | 1.18 | 0.94 | 3.43 | 6.1 | 92.7 | Clear | No Odor |
| 12:20 | 5 | 100 | 4.90 | 0.26 | 6.69 | 1.17 | 0.02 | 3.25 | 6.2 | 96.2 | Clear | No Odor |
| 12:25 | 5 | 100 | 4.90 | 0.39 | 6.69 | 1.29 | 0.02 | 3.05 | 6.4 | 100.4 | Clear | No Odor |
| 12:30 | 5 | 100 | 4.90 | 0.52 | 6.73 | 1.59 | 0.02 | 2.06 | 6.7 | 80.1 | Clear | No Odor |
| 12:35 | 5 | 100 | 4.90 | 0.65 | 6.78 | 1.83 | 0.02 | 1.46 | 6.8 | 43.5 | Clear | No Odor |
| 12:40 | 5 | 100 | 4.90 | 0.78 | 6.79 | 1.93 | 0.02 | 1.34 | 6.9 | 27.6 | Clear | No Odor |
| 12:45 | 5 | 100 | 4.90 | 0.91 | 6.79 | 2.05 | 0.02 | 1.18 | 6.9 | 14.7 | Clear | No Odor |
| 12:50 | 5 | 100 | 4.90 | 1.04 | 6.79 | 2.18 | 0.02 | 1.12 | 7.0 | 2.8 | Clear | No Odor |
| 12:55 | 5 | 100 | 4.90 | 1.17 | 6.80 | 2.25 | 0.02 | 1.01 | 7.1 | -5.2 | Clear | No Odor |
| 13:00 | 5 | 100 | 4.90 | 1.30 | 6.81 | 2.32 | 0.02 | 0.90 | 7.1 | -12.6 | Clear | No Odor |
| 13:05 | 5 | 100 | 4.90 | 1.43 | 6.81 | 2.34 | 0.79 | 0.83 | 7.1 | -14.4 | Clear | No Odor |
| 13:10 | 5 | 100 | 4.90 | 1.56 | 6.81 | 2.40 | 0.36 | 1.11 | 7.1 | -16.9 | Clear | No Odor |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
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*Turbidity < 50 NTU and ±10% or within 1 NTU of a previous reading when <10 NTU

| Constituents Sampled | Container | Number | Preservative |
|---|-------------|--------|--------------|
| 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, PCE, TCE, VC | 40 mL Glass | 3 | HCL |
| 1,4-dioxane | 40 mL Glass | 3 | HCL |

Comments _____ None _____

Well Casing Volumes

Gallons/Foot 1" = 0.04 1.25" = 0.06 1.5" = 0.09 2" = 0.16 2.5" = 0.26 3" = 0.37 3.5" = 0.50 4" = 0.65 6" = 1.47

Well Information

Well Location: 12131 Boston Post; back yard Well Locked at Arrival: yes

Condition of Well: Good Well Locked at Departure: yes

Well Completion: Flush mount Lock Functioning: yes

SHALLOW LOW-FLOW GROUNDWATER SAMPLING FORM

Project No.: 30050315.402.01 Page 1 of 1

Site Location: Ford LTP 12131 Boston Post; back yard

Prepared By: Emma Witherspoon

| Date | Time | Description of Activities |
|-----------|-------|---|
| 2/12/2021 | 23:40 | Arrive onsite |
| 2/12/2021 | 12:01 | Record static depth to water |
| 2/12/2021 | 12:07 | Begin purging well |
| 2/12/2021 | 13:10 | Collect sample MW-95S_021221 |
| 2/12/2021 | 13:14 | End purge and turn off pump, begin decon of equipment |
| 2/12/2021 | 13:30 | Offsite |
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Field staff signature: Emma Witherspoon

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

Volatile Organic Compounds (VOC) Analysis

SDG # 240-144569-1

CADENA Verification Report: 2021-02-28

Analyses Performed By:

TestAmerica

North Canton, Ohio

Report # 40578R

Review Level: Tier III

Project: 30050315.402.02



DATA REVIEW

SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144569-1 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:

| Sample ID | Lab ID | Matrix | Sample Collection Date | Parent Sample | Analysis | |
|---------------|--------------|--------|------------------------|---------------|----------|---------|
| | | | | | VOC | VOC SIM |
| TRIP BLANK | 240-144569-1 | Water | 02/12/2021 | | X | |
| MW-95S_021221 | 240-144569-2 | Water | 02/12/2021 | | 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 ensure 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. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

A field duplicate sample was not collected for samples from this SDG.

DATA REVIEW

6. Compound Identification

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

All identified compounds met the specified criteria.

7. 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 | |
| Field Duplicate RPD | 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

DATA REVIEW

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE: 

DATE: March 17, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 18, 2021

**NO CORRECTIONS/QUALIFIERS ADDED
TO SAMPLE ANALYSIS DATA SHEETS**



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

