

11/6/2018
Mr. Jim Tomalia
Arcadis U.S., Inc.
28550 Cabot Dr.
Suite 500
Novi MI 48377

Project Name: Ford LTP
Project #:
Workorder #: 1810685A

Dear Mr. Jim Tomalia

The following report includes the data for the above referenced project for sample(s) received on 10/31/2018 at Air Toxics Ltd.

The data and associated QC analyzed by Modified TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Ausha Scott at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Ausha Scott
Project Manager

WORK ORDER #: 1810685A

Work Order Summary

| | | | |
|------------------------|---|------------------|---|
| CLIENT: | Mr. Jim Tomalia Arcadis U.S., Inc. 28550 Cabot Dr. Suite 500 Novi, MI 48377 | BILL TO: | Accounts Payable Arcadis U.S., Inc. 630 Plaza Drive Suite 600 Highlands Ranch, CO 80129 |
| PHONE: | 517-819-0356 | P.O. # | MI001454.0003 |
| FAX: | | PROJECT # | Ford LTP |
| DATE RECEIVED: | 10/31/2018 | CONTACT: | Ausha Scott |
| DATE COMPLETED: | 11/06/2018 | | |

| <u>FRACTION #</u> | <u>NAME</u> | <u>TEST</u> | <u>RECEIPT VAC./PRES.</u> | <u>FINAL PRESSURE</u> |
|-------------------|-------------------------------|----------------|-------------------------------|---------------------------|
| 01A | AA-34990Wadsworth-01_102618 | Modified TO-15 | 5.3 "Hg | 5.1 psi |
| 02A | IAG-34990Wadsworth-01_102618 | Modified TO-15 | 6.9 "Hg | 5.1 psi |
| 03A | IACS-34990Wadsworth-02_102618 | Modified TO-15 | 10.4 "Hg | 5.1 psi |
| 04A | IAF-34990Wadsworth-03_102618 | Modified TO-15 | 5.3 "Hg | 5 psi |
| 05A | IAF-34990Wadsworth-04_102618 | Modified TO-15 | 0.4 "Hg | 5.2 psi |
| 06A | Lab Blank | Modified TO-15 | NA | NA |
| 07A | CCV | Modified TO-15 | NA | NA |
| 08A | LCS | Modified TO-15 | NA | NA |
| 08AA | LCSD | Modified TO-15 | NA | NA |

CERTIFIED BY: 

 Technical Director

DATE: 11/06/18

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
 TX NELAP - T104704434-15-9, UT NELAP CA0093332015-6, VA NELAP - 8113, WA NELAP - C935
 Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
 Accreditation number: CA300005, Effective date: 10/18/2015, Expiration date: 10/17/2016.

Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

This report shall not be reproduced, except in full, without the written approval of Eurofins Air Toxics, Inc.

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
 (916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified TO-15
Arcadis U.S., Inc.
Workorder# 1810685A

Five 6 Liter Summa Canister (100% Certified) samples were received on October 31, 2018. The laboratory performed analysis via modified EPA Method TO-15 using GC/MS in the full scan mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Method modifications taken to run these samples are summarized in the table below. Specific project requirements may over-ride the ATL modifications.

| <i>Requirement</i> | <i>TO-15</i> | <i>ATL Modifications</i> |
|---------------------|--|--|
| Initial Calibration | </=30% RSD with 2 compounds allowed out to < 40% RSD | </=30% RSD with 4 compounds allowed out to < 40% RSD |
| Blank and standards | Zero Air | UHP Nitrogen provides a higher purity gas matrix than zero air |

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

As per client project requirements, the laboratory has reported estimated values for target compound hits that are below the Reporting Limit but greater than the Method Detection Limit. Concentrations that are below the level at which the canister was certified may be false positives.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

- B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).
- J - Estimated value.
- E - Exceeds instrument calibration range.
- S - Saturated peak.
- Q - Exceeds quality control limits.
- U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.
- UJ- Non-detected compound associated with low bias in the CCV
- N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates

as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

| | | | |
|-----------------------------|---|-----------------------------|---------------------|
| Client ID: | AA-34990Wadsworth-01_102618 | Date/Time Analyzed: | 11/1/18 03:11 PM |
| Lab ID: | 1810685A-01A | Dilution Factor: | 1.64 |
| Date/Time Collected: | 10/27/18 11:12 AM | Instrument/Filename: | msd20.i / 201110107 |
| Media: | 6 Liter Summa Canister (100% Certified) | | |

| Compound | CAS# | MDL (ug/m3) | LOD (ug/m3) | Rpt. Limit (ug/m3) | Amount (ug/m3) |
|--------------------------|----------|----------------|----------------|-----------------------|-------------------|
| 1,1-Dichloroethene | 75-35-4 | 0.34 | 0.58 | 0.65 | Not Detected |
| 1,4-Dioxane | 123-91-1 | 0.45 | 0.53 | 0.59 | Not Detected |
| cis-1,2-Dichloroethene | 156-59-2 | 0.26 | 0.58 | 0.65 | Not Detected |
| Tetrachloroethene | 127-18-4 | 0.63 | 1.0 | 1.1 | Not Detected |
| trans-1,2-Dichloroethene | 156-60-5 | 0.41 | 0.58 | 0.65 | Not Detected |
| Trichloroethene | 79-01-6 | 0.34 | 0.79 | 0.88 | Not Detected |
| Vinyl Chloride | 75-01-4 | 0.24 | 0.38 | 0.42 | Not Detected |

D: Analyte not within the DoD scope of accreditation.

| Surrogates | CAS# | Limits | %Recovery |
|-----------------------|------------|--------|-----------|
| 1,2-Dichloroethane-d4 | 17060-07-0 | 70-130 | 87 |
| 4-Bromofluorobenzene | 460-00-4 | 70-130 | 110 |
| Toluene-d8 | 2037-26-5 | 70-130 | 96 |

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

| | | | |
|-----------------------------|---|-----------------------------|--------------------|
| Client ID: | IAG-34990Wadsworth-01_102618 | Date/Time Analyzed: | 11/1/18 03:50 PM |
| Lab ID: | 1810685A-02A | Dilution Factor: | 1.75 |
| Date/Time Collected: | 10/27/18 11:09 AM | Instrument/Filename: | msd20.i / 20110108 |
| Media: | 6 Liter Summa Canister (100% Certified) | | |

| Compound | CAS# | MDL (ug/m3) | LOD (ug/m3) | Rpt. Limit (ug/m3) | Amount (ug/m3) |
|--------------------------|----------|----------------|----------------|-----------------------|-------------------|
| 1,1-Dichloroethene | 75-35-4 | 0.36 | 0.62 | 0.69 | Not Detected |
| 1,4-Dioxane | 123-91-1 | 0.48 | 0.57 | 0.63 | Not Detected |
| cis-1,2-Dichloroethene | 156-59-2 | 0.28 | 0.62 | 0.69 | Not Detected |
| Tetrachloroethene | 127-18-4 | 0.67 | 1.1 | 1.2 | Not Detected |
| trans-1,2-Dichloroethene | 156-60-5 | 0.44 | 0.62 | 0.69 | Not Detected |
| Trichloroethene | 79-01-6 | 0.37 | 0.85 | 0.94 | Not Detected |
| Vinyl Chloride | 75-01-4 | 0.26 | 0.40 | 0.45 | Not Detected |

D: Analyte not within the DoD scope of accreditation.

| Surrogates | CAS# | Limits | %Recovery |
|-----------------------|------------|--------|-----------|
| 1,2-Dichloroethane-d4 | 17060-07-0 | 70-130 | 86 |
| 4-Bromofluorobenzene | 460-00-4 | 70-130 | 105 |
| Toluene-d8 | 2037-26-5 | 70-130 | 95 |

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

| | | | |
|-----------------------------|---|-----------------------------|--------------------|
| Client ID: | IACS-34990Wadsworth-02_102618 | Date/Time Analyzed: | 11/1/18 04:30 PM |
| Lab ID: | 1810685A-03A | Dilution Factor: | 2.06 |
| Date/Time Collected: | 10/27/18 11:00 AM | Instrument/Filename: | msd20.i / 20110109 |
| Media: | 6 Liter Summa Canister (100% Certified) | | |

| Compound | CAS# | MDL (ug/m3) | LOD (ug/m3) | Rpt. Limit (ug/m3) | Amount (ug/m3) |
|--------------------------|----------|----------------|----------------|-----------------------|-------------------|
| 1,1-Dichloroethene | 75-35-4 | 0.43 | 0.74 | 0.82 | Not Detected |
| 1,4-Dioxane | 123-91-1 | 0.57 | 0.67 | 0.74 | Not Detected |
| cis-1,2-Dichloroethene | 156-59-2 | 0.33 | 0.74 | 0.82 | Not Detected |
| Tetrachloroethene | 127-18-4 | 0.79 | 1.2 | 1.4 | Not Detected |
| trans-1,2-Dichloroethene | 156-60-5 | 0.52 | 0.74 | 0.82 | Not Detected |
| Trichloroethene | 79-01-6 | 0.43 | 1.0 | 1.1 | Not Detected |
| Vinyl Chloride | 75-01-4 | 0.30 | 0.47 | 0.53 | Not Detected |

D: Analyte not within the DoD scope of accreditation.

| Surrogates | CAS# | Limits | %Recovery |
|-----------------------|------------|--------|-----------|
| 1,2-Dichloroethane-d4 | 17060-07-0 | 70-130 | 89 |
| 4-Bromofluorobenzene | 460-00-4 | 70-130 | 105 |
| Toluene-d8 | 2037-26-5 | 70-130 | 95 |

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

| | | | |
|-----------------------------|---|-----------------------------|--------------------|
| Client ID: | IAF-34990Wadsworth-03_102618 | Date/Time Analyzed: | 11/1/18 05:09 PM |
| Lab ID: | 1810685A-04A | Dilution Factor: | 1.63 |
| Date/Time Collected: | 10/27/18 11:07 AM | Instrument/Filename: | msd20.i / 20110110 |
| Media: | 6 Liter Summa Canister (100% Certified) | | |

| Compound | CAS# | MDL (ug/m3) | LOD (ug/m3) | Rpt. Limit (ug/m3) | Amount (ug/m3) |
|--------------------------|----------|----------------|----------------|-----------------------|-------------------|
| 1,1-Dichloroethene | 75-35-4 | 0.34 | 0.58 | 0.65 | Not Detected |
| 1,4-Dioxane | 123-91-1 | 0.45 | 0.53 | 0.59 | Not Detected |
| cis-1,2-Dichloroethene | 156-59-2 | 0.26 | 0.58 | 0.65 | Not Detected |
| Tetrachloroethene | 127-18-4 | 0.62 | 1.0 | 1.1 | Not Detected |
| trans-1,2-Dichloroethene | 156-60-5 | 0.41 | 0.58 | 0.65 | Not Detected |
| Trichloroethene | 79-01-6 | 0.34 | 0.79 | 0.88 | 0.46 J |
| Vinyl Chloride | 75-01-4 | 0.24 | 0.37 | 0.42 | Not Detected |

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.

| Surrogates | CAS# | Limits | %Recovery |
|-----------------------|------------|--------|-----------|
| 1,2-Dichloroethane-d4 | 17060-07-0 | 70-130 | 89 |
| 4-Bromofluorobenzene | 460-00-4 | 70-130 | 109 |
| Toluene-d8 | 2037-26-5 | 70-130 | 92 |

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

| | | | |
|-----------------------------|---|-----------------------------|--------------------|
| Client ID: | IAF-34990Wadsworth-04_102618 | Date/Time Analyzed: | 11/1/18 05:48 PM |
| Lab ID: | 1810685A-05A | Dilution Factor: | 1.37 |
| Date/Time Collected: | 10/27/18 11:06 AM | Instrument/Filename: | msd20.i / 20110111 |
| Media: | 6 Liter Summa Canister (100% Certified) | | |

| Compound | CAS# | MDL (ug/m3) | LOD (ug/m3) | Rpt. Limit (ug/m3) | Amount (ug/m3) |
|--------------------------|----------|----------------|----------------|-----------------------|-------------------|
| 1,1-Dichloroethene | 75-35-4 | 0.28 | 0.49 | 0.54 | Not Detected |
| 1,4-Dioxane | 123-91-1 | 0.38 | 0.44 | 0.49 | Not Detected |
| cis-1,2-Dichloroethene | 156-59-2 | 0.22 | 0.49 | 0.54 | Not Detected |
| Tetrachloroethene | 127-18-4 | 0.52 | 0.84 | 0.93 | Not Detected |
| trans-1,2-Dichloroethene | 156-60-5 | 0.34 | 0.49 | 0.54 | Not Detected |
| Trichloroethene | 79-01-6 | 0.29 | 0.66 | 0.74 | Not Detected |
| Vinyl Chloride | 75-01-4 | 0.20 | 0.32 | 0.35 | Not Detected |

D: Analyte not within the DoD scope of accreditation.

| Surrogates | CAS# | Limits | %Recovery |
|-----------------------|------------|--------|-----------|
| 1,2-Dichloroethane-d4 | 17060-07-0 | 70-130 | 86 |
| 4-Bromofluorobenzene | 460-00-4 | 70-130 | 110 |
| Toluene-d8 | 2037-26-5 | 70-130 | 94 |

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

| | | | |
|-----------------------------|---------------------|-----------------------------|---------------------|
| Client ID: | Lab Blank | Date/Time Analyzed: | 11/1/18 12:24 PM |
| Lab ID: | 1810685A-06A | Dilution Factor: | 1.00 |
| Date/Time Collected: | NA - Not Applicable | Instrument/Filename: | msd20.i / 20110106c |
| Media: | NA - Not Applicable | | |

| Compound | CAS# | MDL (ug/m3) | LOD (ug/m3) | Rpt. Limit (ug/m3) | Amount (ug/m3) |
|--------------------------|----------|----------------|----------------|-----------------------|-------------------|
| 1,1-Dichloroethene | 75-35-4 | 0.21 | 0.36 | 0.40 | Not Detected |
| 1,4-Dioxane | 123-91-1 | 0.27 | 0.32 | 0.36 | Not Detected |
| cis-1,2-Dichloroethene | 156-59-2 | 0.16 | 0.36 | 0.40 | Not Detected |
| Tetrachloroethene | 127-18-4 | 0.38 | 0.61 | 0.68 | Not Detected |
| trans-1,2-Dichloroethene | 156-60-5 | 0.25 | 0.36 | 0.40 | Not Detected |
| Trichloroethene | 79-01-6 | 0.21 | 0.48 | 0.54 | Not Detected |
| Vinyl Chloride | 75-01-4 | 0.15 | 0.23 | 0.26 | Not Detected |

D: Analyte not within the DoD scope of accreditation.

| Surrogates | CAS# | Limits | %Recovery |
|-----------------------|------------|--------|-----------|
| 1,2-Dichloroethane-d4 | 17060-07-0 | 70-130 | 86 |
| 4-Bromofluorobenzene | 460-00-4 | 70-130 | 111 |
| Toluene-d8 | 2037-26-5 | 70-130 | 96 |

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

| | | | |
|-----------------------------|---------------------|-----------------------------|--------------------|
| Client ID: | CCV | Date/Time Analyzed: | 11/1/18 09:05 AM |
| Lab ID: | 1810685A-07A | Dilution Factor: | 1.00 |
| Date/Time Collected: | NA - Not Applicable | Instrument/Filename: | msd20.i / 20110102 |
| Media: | NA - Not Applicable | | |

| Compound | CAS# | %Recovery |
|--------------------------|----------|-----------|
| 1,1-Dichloroethene | 75-35-4 | 81 |
| 1,4-Dioxane | 123-91-1 | 98 |
| cis-1,2-Dichloroethene | 156-59-2 | 89 |
| Tetrachloroethene | 127-18-4 | 108 |
| trans-1,2-Dichloroethene | 156-60-5 | 91 |
| Trichloroethene | 79-01-6 | 107 |
| Vinyl Chloride | 75-01-4 | 83 |

D: Analyte not within the DoD scope of accreditation.

| Surrogates | CAS# | Limits | %Recovery |
|-----------------------|------------|--------|-----------|
| 1,2-Dichloroethane-d4 | 17060-07-0 | 70-130 | 82 |
| 4-Bromofluorobenzene | 460-00-4 | 70-130 | 108 |
| Toluene-d8 | 2037-26-5 | 70-130 | 101 |

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

| | | | |
|-----------------------------|---------------------|-----------------------------|--------------------|
| Client ID: | LCS | Date/Time Analyzed: | 11/1/18 09:44 AM |
| Lab ID: | 1810685A-08A | Dilution Factor: | 1.00 |
| Date/Time Collected: | NA - Not Applicable | Instrument/Filename: | msd20.i / 20110103 |
| Media: | NA - Not Applicable | | |

| Compound | CAS# | %Recovery |
|--------------------------|----------|-----------|
| 1,1-Dichloroethene | 75-35-4 | 88 |
| 1,4-Dioxane | 123-91-1 | 91 |
| cis-1,2-Dichloroethene | 156-59-2 | 84 |
| Tetrachloroethene | 127-18-4 | 108 |
| trans-1,2-Dichloroethene | 156-60-5 | 104 |
| Trichloroethene | 79-01-6 | 108 |
| Vinyl Chloride | 75-01-4 | 86 |

D: Analyte not within the DoD scope of accreditation.

| Surrogates | CAS# | Limits | %Recovery |
|-----------------------|------------|--------|-----------|
| 1,2-Dichloroethane-d4 | 17060-07-0 | 70-130 | 82 |
| 4-Bromofluorobenzene | 460-00-4 | 70-130 | 108 |
| Toluene-d8 | 2037-26-5 | 70-130 | 100 |

* % Recovery is calculated using unrounded analytical results.

MODIFIED EPA METHOD TO-15 GC/MS FULL SCAN
Ford LTP

| | | | |
|-----------------------------|---------------------|-----------------------------|--------------------|
| Client ID: | LCSD | Date/Time Analyzed: | 11/1/18 10:23 AM |
| Lab ID: | 1810685A-08AA | Dilution Factor: | 1.00 |
| Date/Time Collected: | NA - Not Applicable | Instrument/Filename: | msd20.i / 20110104 |
| Media: | NA - Not Applicable | | |

| Compound | CAS# | %Recovery |
|--------------------------|----------|-----------|
| 1,1-Dichloroethene | 75-35-4 | 86 |
| 1,4-Dioxane | 123-91-1 | 89 |
| cis-1,2-Dichloroethene | 156-59-2 | 84 |
| Tetrachloroethene | 127-18-4 | 107 |
| trans-1,2-Dichloroethene | 156-60-5 | 102 |
| Trichloroethene | 79-01-6 | 108 |
| Vinyl Chloride | 75-01-4 | 86 |

D: Analyte not within the DoD scope of accreditation.

| Surrogates | CAS# | Limits | %Recovery |
|-----------------------|------------|--------|-----------|
| 1,2-Dichloroethane-d4 | 17060-07-0 | 70-130 | 78 |
| 4-Bromofluorobenzene | 460-00-4 | 70-130 | 109 |
| Toluene-d8 | 2037-26-5 | 70-130 | 99 |

* % Recovery is calculated using unrounded analytical results.



November 07, 2018

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

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: MI001454.0002/3/4.00002/2B/3B
Client project scope reference: Sample COC only was used to define project analytical requirements.
Laboratory: Eurofins Air Toxics - Folsom
Laboratory submittal: 1810685A
Sample date: 2018-10-27
Report received by CADENA: 2018-11-06
Initial Data Verification completed by CADENA: 2018-11-07

5 Air samples were analyzed for TO-15 parameters.

There were no significant QC anomalies or exceptions to report.

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

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. |

11/7/2018
Mr. Jim Tomalia
Arcadis U.S., Inc.
28550 Cabot Dr.
Suite 500
Novi MI 48377

Project Name: Ford LTP
Project #:
Workorder #: 1810685B

Dear Mr. Jim Tomalia

The following report includes the data for the above referenced project for sample(s) received on 10/31/2018 at Air Toxics Ltd.

The data and associated QC analyzed by TO-15 are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics Inc. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Ausha Scott at 916-985-1000 if you have any questions regarding the data in this report.

Regards,



Ausha Scott
Project Manager

WORK ORDER #: 1810685B

Work Order Summary

| | | | |
|------------------------|---|------------------|---|
| CLIENT: | Mr. Jim Tomalia Arcadis U.S., Inc. 28550 Cabot Dr. Suite 500 Novi, MI 48377 | BILL TO: | Accounts Payable Arcadis U.S., Inc. 630 Plaza Drive Suite 600 Highlands Ranch, CO 80129 |
| PHONE: | 517-819-0356 | P.O. # | MI001454.0003 |
| FAX: | | PROJECT # | Ford LTP |
| DATE RECEIVED: | 10/31/2018 | CONTACT: | Ausha Scott |
| DATE COMPLETED: | 11/07/2018 | | |

| <u>FRACTION #</u> | <u>NAME</u> | <u>TEST</u> | <u>RECEIPT VAC./PRES.</u> | <u>FINAL PRESSURE</u> |
|-------------------|-------------------------------|-------------|-------------------------------|---------------------------|
| 06A | SSMP-34990Wadsworth-01_102718 | TO-15 | 3.7 "Hg | 15.3 psi |
| 07A | SSMP-34990Wadsworth-02_102718 | TO-15 | 4.1 "Hg | 15.2 psi |
| 08A | SSMP-34990Wadsworth-03_102718 | TO-15 | 3.5 "Hg | 15.1 psi |
| 09A | Lab Blank | TO-15 | NA | NA |
| 10A | CCV | TO-15 | NA | NA |
| 11A | LCS | TO-15 | NA | NA |
| 11AA | LCSD | TO-15 | NA | NA |

CERTIFIED BY: 

 Technical Director

DATE: 11/07/18

Certification numbers: AZ Licensure AZ0775, NJ NELAP - CA016, NY NELAP - 11291,
 TX NELAP - T104704434-15-9, UT NELAP CA0093332015-6, VA NELAP - 8113, WA NELAP - C935
 Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
 Accreditation number: CA300005, Effective date: 10/18/2015, Expiration date: 10/17/2016.

Eurofins Air Toxics Inc.. certifies that the test results contained in this report meet all requirements of the NELAC standards

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LABORATORY NARRATIVE
EPA Method TO-15
Arcadis U.S., Inc.
Workorder# 1810685B

Three 1 Liter Summa Canister samples were received on October 31, 2018. The laboratory performed analysis via EPA Method TO-15 using GC/MS in the full scan mode.

This workorder was independently validated prior to submittal using 'USEPA National Functional Guidelines' as generally applied to the analysis of volatile organic compounds in air. A rules-based, logic driven, independent validation engine was employed to assess completeness, evaluate pass/fail of relevant project quality control requirements and verification of all quantified amounts.

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

As per client project requirements, the laboratory has reported estimated values for target compound hits that are below the Reporting Limit but greater than the Method Detection Limit. Concentrations that are below the level at which the canister was certified (0.2 ppbv for compounds reported at 0.5 ppbv and 0.8 ppbv for compounds reported at 2.0 ppbv) may be false positives.

Definition of Data Qualifying Flags

Ten qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit, LOD, or MDL value. See data page for project specific U-flag definition.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

M - Reported value may be biased due to apparent matrix interferences.

CN - See Case Narrative.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

EPA METHOD TO-15 GC/MS FULL SCAN
 Ford LTP

| | | | |
|-----------------------------|-------------------------------|-----------------------------|--------------------|
| Client ID: | SSMP-34990Wadsworth-01_102718 | Date/Time Analyzed: | 11/2/18 12:10 AM |
| Lab ID: | 1810685B-06A | Dilution Factor: | 2.33 |
| Date/Time Collected: | 10/27/18 11:31 AM | Instrument/Filename: | msd17.i / 17110117 |
| Media: | 1 Liter Summa Canister | | |

| Compound | CAS# | MDL (ug/m3) | LOD (ug/m3) | Rpt. Limit (ug/m3) | Amount (ug/m3) |
|--------------------------|----------|----------------|----------------|-----------------------|-------------------|
| 1,1-Dichloroethene | 75-35-4 | 2.0 | 3.7 | 4.6 | Not Detected |
| 1,4-Dioxane | 123-91-1 | 3.7 | 12 | 17 | Not Detected |
| cis-1,2-Dichloroethene | 156-59-2 | 0.74 | 3.7 | 4.6 | Not Detected |
| Tetrachloroethene | 127-18-4 | 1.1 | 6.3 | 7.9 | Not Detected |
| trans-1,2-Dichloroethene | 156-60-5 | 1.4 | 3.7 | 4.6 | Not Detected |
| Trichloroethene | 79-01-6 | 2.4 | 5.0 | 6.3 | Not Detected |
| Vinyl Chloride | 75-01-4 | 0.71 | 2.4 | 3.0 | Not Detected |

D: Analyte not within the DoD scope of accreditation.

| Surrogates | CAS# | Limits | %Recovery |
|-----------------------|------------|--------|-----------|
| 1,2-Dichloroethane-d4 | 17060-07-0 | 70-130 | 98 |
| 4-Bromofluorobenzene | 460-00-4 | 70-130 | 91 |
| Toluene-d8 | 2037-26-5 | 70-130 | 107 |

EPA METHOD TO-15 GC/MS FULL SCAN
 Ford LTP

| | | | |
|-----------------------------|-------------------------------|-----------------------------|--------------------|
| Client ID: | SSMP-34990Wadsworth-02_102718 | Date/Time Analyzed: | 11/2/18 12:38 AM |
| Lab ID: | 1810685B-07A | Dilution Factor: | 2.36 |
| Date/Time Collected: | 10/27/18 12:03 PM | Instrument/Filename: | msd17.i / 17110118 |
| Media: | 1 Liter Summa Canister | | |

| Compound | CAS# | MDL (ug/m3) | LOD (ug/m3) | Rpt. Limit (ug/m3) | Amount (ug/m3) |
|--------------------------|----------|----------------|----------------|-----------------------|-------------------|
| 1,1-Dichloroethene | 75-35-4 | 2.0 | 3.7 | 4.7 | Not Detected |
| 1,4-Dioxane | 123-91-1 | 3.7 | 13 | 17 | Not Detected |
| cis-1,2-Dichloroethene | 156-59-2 | 0.75 | 3.7 | 4.7 | Not Detected |
| Tetrachloroethene | 127-18-4 | 1.1 | 6.4 | 8.0 | 1.7 J |
| trans-1,2-Dichloroethene | 156-60-5 | 1.4 | 3.7 | 4.7 | Not Detected |
| Trichloroethene | 79-01-6 | 2.4 | 5.1 | 6.3 | Not Detected |
| Vinyl Chloride | 75-01-4 | 0.72 | 2.4 | 3.0 | Not Detected |

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.

| Surrogates | CAS# | Limits | %Recovery |
|-----------------------|------------|--------|-----------|
| 1,2-Dichloroethane-d4 | 17060-07-0 | 70-130 | 97 |
| 4-Bromofluorobenzene | 460-00-4 | 70-130 | 87 |
| Toluene-d8 | 2037-26-5 | 70-130 | 106 |

EPA METHOD TO-15 GC/MS FULL SCAN
 Ford LTP

| | | | |
|-----------------------------|-------------------------------|-----------------------------|--------------------|
| Client ID: | SSMP-34990Wadsworth-03_102718 | Date/Time Analyzed: | 11/2/18 01:06 AM |
| Lab ID: | 1810685B-08A | Dilution Factor: | 2.29 |
| Date/Time Collected: | 10/27/18 12:33 PM | Instrument/Filename: | msd17.i / 17110119 |
| Media: | 1 Liter Summa Canister | | |

| Compound | CAS# | MDL (ug/m3) | LOD (ug/m3) | Rpt. Limit (ug/m3) | Amount (ug/m3) |
|--------------------------|----------|----------------|----------------|-----------------------|-------------------|
| 1,1-Dichloroethene | 75-35-4 | 2.0 | 3.6 | 4.5 | Not Detected |
| 1,4-Dioxane | 123-91-1 | 3.6 | 12 | 16 | Not Detected |
| cis-1,2-Dichloroethene | 156-59-2 | 0.73 | 3.6 | 4.5 | Not Detected |
| Tetrachloroethene | 127-18-4 | 1.1 | 6.2 | 7.8 | 1.3 J |
| trans-1,2-Dichloroethene | 156-60-5 | 1.4 | 3.6 | 4.5 | Not Detected |
| Trichloroethene | 79-01-6 | 2.3 | 4.9 | 6.2 | Not Detected |
| Vinyl Chloride | 75-01-4 | 0.70 | 2.3 | 2.9 | Not Detected |

J = Estimated value.

D: Analyte not within the DoD scope of accreditation.

| Surrogates | CAS# | Limits | %Recovery |
|-----------------------|------------|--------|-----------|
| 1,2-Dichloroethane-d4 | 17060-07-0 | 70-130 | 98 |
| 4-Bromofluorobenzene | 460-00-4 | 70-130 | 91 |
| Toluene-d8 | 2037-26-5 | 70-130 | 106 |

EPA METHOD TO-15 GC/MS FULL SCAN
 Ford LTP

| | | | |
|-----------------------------|---------------------|-----------------------------|---------------------|
| Client ID: | Lab Blank | Date/Time Analyzed: | 11/1/18 03:20 PM |
| Lab ID: | 1810685B-09A | Dilution Factor: | 1.00 |
| Date/Time Collected: | NA - Not Applicable | Instrument/Filename: | msd17.i / 17110105a |
| Media: | NA - Not Applicable | | |

| Compound | CAS# | MDL (ug/m3) | LOD (ug/m3) | Rpt. Limit (ug/m3) | Amount (ug/m3) |
|--------------------------|----------|----------------|----------------|-----------------------|-------------------|
| 1,1-Dichloroethene | 75-35-4 | 0.87 | 1.6 | 2.0 | Not Detected |
| 1,4-Dioxane | 123-91-1 | 1.6 | 5.4 | 7.2 | Not Detected |
| cis-1,2-Dichloroethene | 156-59-2 | 0.32 | 1.6 | 2.0 | Not Detected |
| Tetrachloroethene | 127-18-4 | 0.47 | 2.7 | 3.4 | Not Detected |
| trans-1,2-Dichloroethene | 156-60-5 | 0.59 | 1.6 | 2.0 | Not Detected |
| Trichloroethene | 79-01-6 | 1.0 | 2.1 | 2.7 | Not Detected |
| Vinyl Chloride | 75-01-4 | 0.31 | 1.0 | 1.3 | Not Detected |

D: Analyte not within the DoD scope of accreditation.

| Surrogates | CAS# | Limits | %Recovery |
|-----------------------|------------|--------|-----------|
| 1,2-Dichloroethane-d4 | 17060-07-0 | 70-130 | 95 |
| 4-Bromofluorobenzene | 460-00-4 | 70-130 | 89 |
| Toluene-d8 | 2037-26-5 | 70-130 | 106 |

EPA METHOD TO-15 GC/MS FULL SCAN
 Ford LTP

| | | | |
|-----------------------------|---------------------|-----------------------------|--------------------|
| Client ID: | CCV | Date/Time Analyzed: | 11/1/18 01:26 PM |
| Lab ID: | 1810685B-10A | Dilution Factor: | 1.00 |
| Date/Time Collected: | NA - Not Applicable | Instrument/Filename: | msd17.i / 17110102 |
| Media: | NA - Not Applicable | | |

| Compound | CAS# | %Recovery |
|--------------------------|----------|-----------|
| 1,1-Dichloroethene | 75-35-4 | 91 |
| 1,4-Dioxane | 123-91-1 | 103 |
| cis-1,2-Dichloroethene | 156-59-2 | 90 |
| Tetrachloroethene | 127-18-4 | 95 |
| trans-1,2-Dichloroethene | 156-60-5 | 91 |
| Trichloroethene | 79-01-6 | 103 |
| Vinyl Chloride | 75-01-4 | 98 |

D: Analyte not within the DoD scope of accreditation.

| Surrogates | CAS# | Limits | %Recovery |
|-----------------------|------------|--------|-----------|
| 1,2-Dichloroethane-d4 | 17060-07-0 | 70-130 | 98 |
| 4-Bromofluorobenzene | 460-00-4 | 70-130 | 92 |
| Toluene-d8 | 2037-26-5 | 70-130 | 108 |

EPA METHOD TO-15 GC/MS FULL SCAN
 Ford LTP

| | | | |
|-----------------------------|---------------------|-----------------------------|--------------------|
| Client ID: | LCS | Date/Time Analyzed: | 11/1/18 02:05 PM |
| Lab ID: | 1810685B-11A | Dilution Factor: | 1.00 |
| Date/Time Collected: | NA - Not Applicable | Instrument/Filename: | msd17.i / 17110103 |
| Media: | NA - Not Applicable | | |

| Compound | CAS# | %Recovery |
|--------------------------|----------|-----------|
| 1,1-Dichloroethene | 75-35-4 | 86 |
| 1,4-Dioxane | 123-91-1 | 108 |
| cis-1,2-Dichloroethene | 156-59-2 | 83 |
| Tetrachloroethene | 127-18-4 | 96 |
| trans-1,2-Dichloroethene | 156-60-5 | 99 |
| Trichloroethene | 79-01-6 | 103 |
| Vinyl Chloride | 75-01-4 | 98 |

D: Analyte not within the DoD scope of accreditation.

| Surrogates | CAS# | Limits | %Recovery |
|-----------------------|------------|--------|-----------|
| 1,2-Dichloroethane-d4 | 17060-07-0 | 70-130 | 94 |
| 4-Bromofluorobenzene | 460-00-4 | 70-130 | 93 |
| Toluene-d8 | 2037-26-5 | 70-130 | 106 |

* % Recovery is calculated using unrounded analytical results.

EPA METHOD TO-15 GC/MS FULL SCAN
 Ford LTP

| | | | |
|-----------------------------|---------------------|-----------------------------|--------------------|
| Client ID: | LCSD | Date/Time Analyzed: | 11/1/18 02:32 PM |
| Lab ID: | 1810685B-11AA | Dilution Factor: | 1.00 |
| Date/Time Collected: | NA - Not Applicable | Instrument/Filename: | msd17.i / 17110104 |
| Media: | NA - Not Applicable | | |

| Compound | CAS# | %Recovery |
|--------------------------|----------|-----------|
| 1,1-Dichloroethene | 75-35-4 | 91 |
| 1,4-Dioxane | 123-91-1 | 110 |
| cis-1,2-Dichloroethene | 156-59-2 | 84 |
| Tetrachloroethene | 127-18-4 | 98 |
| trans-1,2-Dichloroethene | 156-60-5 | 101 |
| Trichloroethene | 79-01-6 | 106 |
| Vinyl Chloride | 75-01-4 | 101 |

D: Analyte not within the DoD scope of accreditation.

| Surrogates | CAS# | Limits | %Recovery |
|-----------------------|------------|--------|-----------|
| 1,2-Dichloroethane-d4 | 17060-07-0 | 70-130 | 97 |
| 4-Bromofluorobenzene | 460-00-4 | 70-130 | 92 |
| Toluene-d8 | 2037-26-5 | 70-130 | 108 |

* % Recovery is calculated using unrounded analytical results.



November 07, 2018

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

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: MI001454.0002/3/4.00002/2B/3B
Client project scope reference: Sample COC only was used to define project analytical requirements.
Laboratory: Eurofins Air Toxics - Folsom
Laboratory submittal: 1810685B
Sample date: 2018-10-27
Report received by CADENA: 2018-11-07
Initial Data Verification completed by CADENA: 2018-11-07

3 Air samples were analyzed for TO-15 parameters.

There were no significant QC anomalies or exceptions to report.

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

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. |