

10/15/2018
Mr. Jim Tomalia
Arcadis U.S., Inc.
28550 Cabot Dr.
Suite 500
Novi MI 48377

Project Name: Ford
Project #: MI001454.0003.00001
Workorder #: 1810150A

Dear Mr. Jim Tomalia

The following report includes the data for the above referenced project for sample(s) received on 10/8/2018 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 #: 1810150A

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. #	MI001454.0003.00001
FAX:		PROJECT #	MI001454.0003.00001 Ford
DATE RECEIVED:	10/08/2018	CONTACT:	Ausha Scott
DATE COMPLETED:	10/15/2018		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>	<u>FINAL PRESSURE</u>
01A	IAF-11897BeldenCt-03_100418	Modified TO-15	6.5 "Hg	5.1 psi
02A	AA-11897BeldenCt-01_100418	Modified TO-15	5.9 "Hg	4.9 psi
03A	IA-DUP-01_100418	Modified TO-15	7.3 "Hg	5.1 psi
04A	AA-DUP-01_100418	Modified TO-15	5.1 "Hg	5.2 psi
05A	IAF-11897BeldenCt-01_100418	Modified TO-15	5.1 "Hg	5 psi
06A	IAG-11897BeldenCt-2_100418	Modified TO-15	5.1 "Hg	5 psi
07A	Lab Blank	Modified TO-15	NA	NA
08A	CCV	Modified TO-15	NA	NA
09A	LCS	Modified TO-15	NA	NA
09AA	LCSD	Modified TO-15	NA	NA

CERTIFIED BY: 

DATE: 10/15/18

Technical Director

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# 1810150A**

Six 6 Liter Summa Canister (100% Certified) samples were received on October 08, 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	$\leq 30\%$ RSD with 2 compounds allowed out to <math>< 40\%</math> RSD	$\leq 30\%$ RSD with 4 compounds allowed out to <math>< 40\%</math> 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

Dilution was performed on samples IAF-11897BeldenCt-03_100418, IA-DUP-01_100418, IAF-11897BeldenCt-01_100418 and IAG-11897BeldenCt-2_100418 due to the presence of high level non-target species.

As per project specific client request the laboratory has reported estimated values for target compound hits that are below the Reporting Limit but greater than the Method Detection Limit. All The canisters used for this project have been certified to the Reporting Limit for the target analytes included in this workorder. 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

Client ID:	IAF-11897BeldenCt-03_100418	Date/Time Analyzed:	10/9/18 07:36 PM
Lab ID:	1810150A-01A	Dilution Factor:	3.44
Date/Time Collected:	10/4/18 05:27 PM	Instrument/Filename:	msdv.i / v100913
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	0.66	1.2	1.4	Not Detected
1,4-Dioxane	123-91-1	0.72	1.1	1.2	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.83	1.2	1.4	Not Detected
Tetrachloroethene	127-18-4	1.2	2.1	2.3	Not Detected
trans-1,2-Dichloroethene	156-60-5	1.2	1.2	1.4	Not Detected
Trichloroethene	79-01-6	0.85	1.7	1.8	Not Detected
Vinyl Chloride	75-01-4	0.67	0.79	0.88	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	107
4-Bromofluorobenzene	460-00-4	70-130	96
Toluene-d8	2037-26-5	70-130	97

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

Client ID:	AA-11897BeldenCt-01_100418	Date/Time Analyzed:	10/9/18 06:20 PM
Lab ID:	1810150A-02A	Dilution Factor:	1.66
Date/Time Collected:	10/4/18 05:22 PM	Instrument/Filename:	msdv.i / v100911
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	0.32	0.59	0.66	Not Detected
1,4-Dioxane	123-91-1	0.35	0.54	0.60	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.40	0.59	0.66	Not Detected
Tetrachloroethene	127-18-4	0.56	1.0	1.1	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.56	0.59	0.66	Not Detected
Trichloroethene	79-01-6	0.41	0.80	0.89	Not Detected
Vinyl Chloride	75-01-4	0.32	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	117
4-Bromofluorobenzene	460-00-4	70-130	88
Toluene-d8	2037-26-5	70-130	100

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

Client ID:	IA-DUP-01_100418	Date/Time Analyzed:	10/9/18 08:14 PM
Lab ID:	1810150A-03A	Dilution Factor:	3.56
Date/Time Collected:	10/4/18 05:27 PM	Instrument/Filename:	msdv.i / v100914
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	0.68	1.3	1.4	Not Detected
1,4-Dioxane	123-91-1	0.75	1.2	1.3	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.86	1.3	1.4	Not Detected
Tetrachloroethene	127-18-4	1.2	2.2	2.4	Not Detected
trans-1,2-Dichloroethene	156-60-5	1.2	1.3	1.4	Not Detected
Trichloroethene	79-01-6	0.88	1.7	1.9	Not Detected
Vinyl Chloride	75-01-4	0.69	0.82	0.91	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	110
4-Bromofluorobenzene	460-00-4	70-130	101
Toluene-d8	2037-26-5	70-130	100

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

Client ID:	AA-DUP-01_100418	Date/Time Analyzed:	10/9/18 06:58 PM
Lab ID:	1810150A-04A	Dilution Factor:	1.63
Date/Time Collected:	10/4/18 05:22 PM	Instrument/Filename:	msdv.i / v100912
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	0.31	0.58	0.65	Not Detected
1,4-Dioxane	123-91-1	0.34	0.53	0.59	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.39	0.58	0.65	Not Detected
Tetrachloroethene	127-18-4	0.55	1.0	1.1	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.55	0.58	0.65	Not Detected
Trichloroethene	79-01-6	0.40	0.79	0.88	Not Detected
Vinyl Chloride	75-01-4	0.32	0.37	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	112
4-Bromofluorobenzene	460-00-4	70-130	95
Toluene-d8	2037-26-5	70-130	100

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

Client ID:	IAF-11897BeldenCt-01_100418	Date/Time Analyzed:	10/9/18 09:29 PM
Lab ID:	1810150A-05A	Dilution Factor:	4.02
Date/Time Collected:	10/4/18 05:24 PM	Instrument/Filename:	msdv.i / v100916
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	0.77	1.4	1.6	Not Detected
1,4-Dioxane	123-91-1	0.84	1.3	1.4	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.97	1.4	1.6	Not Detected
Tetrachloroethene	127-18-4	1.4	2.4	2.7	Not Detected
trans-1,2-Dichloroethene	156-60-5	1.4	1.4	1.6	Not Detected
Trichloroethene	79-01-6	0.99	1.9	2.2	Not Detected
Vinyl Chloride	75-01-4	0.78	0.92	1.0	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	101
4-Bromofluorobenzene	460-00-4	70-130	96
Toluene-d8	2037-26-5	70-130	97

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

Client ID:	IAG-11897BeldenCt-2_100418	Date/Time Analyzed:	10/9/18 08:51 PM
Lab ID:	1810150A-06A	Dilution Factor:	3.22
Date/Time Collected:	10/4/18 05:27 PM	Instrument/Filename:	msdv.i / v100915
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	0.62	1.1	1.3	Not Detected
1,4-Dioxane	123-91-1	0.68	1.0	1.2	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.77	1.1	1.3	Not Detected
Tetrachloroethene	127-18-4	1.1	2.0	2.2	Not Detected
trans-1,2-Dichloroethene	156-60-5	1.1	1.1	1.3	Not Detected
Trichloroethene	79-01-6	0.79	1.6	1.7	Not Detected
Vinyl Chloride	75-01-4	0.62	0.74	0.82	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	110
4-Bromofluorobenzene	460-00-4	70-130	94
Toluene-d8	2037-26-5	70-130	97

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

Client ID:	Lab Blank	Date/Time Analyzed:	10/9/18 01:05 PM
Lab ID:	1810150A-07A	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msdv.i / v100906a
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	0.19	0.36	0.40	Not Detected
1,4-Dioxane	123-91-1	0.21	0.32	0.36	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.24	0.36	0.40	Not Detected
Tetrachloroethene	127-18-4	0.34	0.61	0.68	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.34	0.36	0.40	Not Detected
Trichloroethene	79-01-6	0.25	0.48	0.54	Not Detected
Vinyl Chloride	75-01-4	0.19	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	108
4-Bromofluorobenzene	460-00-4	70-130	94
Toluene-d8	2037-26-5	70-130	98

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

Client ID:	CCV	Date/Time Analyzed:	10/9/18 08:54 AM
Lab ID:	1810150A-08A	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msdv.i / v100902
Media:	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	96
1,4-Dioxane	123-91-1	102
cis-1,2-Dichloroethene	156-59-2	96
Tetrachloroethene	127-18-4	106
trans-1,2-Dichloroethene	156-60-5	101
Trichloroethene	79-01-6	104
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	99
4-Bromofluorobenzene	460-00-4	70-130	96
Toluene-d8	2037-26-5	70-130	99

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

Client ID:	LCS	Date/Time Analyzed:	10/9/18 10:26 AM
Lab ID:	1810150A-09A	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msdv.i / v100903
Media:	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	86
1,4-Dioxane	123-91-1	99
cis-1,2-Dichloroethene	156-59-2	80
Tetrachloroethene	127-18-4	106
trans-1,2-Dichloroethene	156-60-5	100
Trichloroethene	79-01-6	106
Vinyl Chloride	75-01-4	92

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	99
4-Bromofluorobenzene	460-00-4	70-130	100
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

Client ID:	LCSD	Date/Time Analyzed:	10/9/18 11:15 AM
Lab ID:	1810150A-09AA	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msdv.i / v100904
Media:	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	91
1,4-Dioxane	123-91-1	100
cis-1,2-Dichloroethene	156-59-2	88
Tetrachloroethene	127-18-4	109
trans-1,2-Dichloroethene	156-60-5	110
Trichloroethene	79-01-6	108
Vinyl Chloride	75-01-4	92

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	102
4-Bromofluorobenzene	460-00-4	70-130	95
Toluene-d8	2037-26-5	70-130	98

* % Recovery is calculated using unrounded analytical results.



October 16, 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: 1810150A
Sample date: 2018-10-04
Report received by CADENA: 2018-10-15
Initial Data Verification completed by CADENA: 2018-10-16

6 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.

10/15/2018
Mr. Jim Tomalia
Arcadis U.S., Inc.
28550 Cabot Dr.
Suite 500
Novi MI 48377

Project Name: Ford
Project #: MI001454.0003.00001
Workorder #: 1810150B

Dear Mr. Jim Tomalia

The following report includes the data for the above referenced project for sample(s) received on 10/8/2018 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 #: 1810150B

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. #	MI001454.0003.00001
FAX:		PROJECT #	MI001454.0003.00001 Ford
DATE RECEIVED:	10/08/2018	CONTACT:	Ausha Scott
DATE COMPLETED:	10/15/2018		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>	<u>FINAL PRESSURE</u>
07A	SSMP-11897BeldenCt-01_100418	TO-15	5.5 "Hg	14.7 psi
08A	SSMP-11897BeldenCt-02_100418	TO-15	3.5 "Hg	15 psi
09A	SSMP-11897BeldenCt-03_100418	TO-15	3.7 "Hg	15.4 psi
10A	SSMP-DUP-02_100418	TO-15	3.5 "Hg	15.4 psi
11A	Lab Blank	TO-15	NA	NA
12A	CCV	TO-15	NA	NA
13A	LCS	TO-15	NA	NA
13AA	LCSD	TO-15	NA	NA

CERTIFIED BY: 

 Technical Director

DATE: 10/15/18

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.

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 (916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
EPA Method TO-15
Arcadis U.S., Inc.
Workorder# 1810150B

Four 1 Liter Summa Canister (100% Certified) samples were received on October 08, 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

The Chain of Custody (COC) information for samples SSMP-11897BeldenCt-02_100418 and SSMP-DUP-02_100418 did not match the entries on the sample tags with regard to sample identification. Therefore the information on the COC was used to process and report the samples.

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

Client ID:	SSMP-11897BeldenCt-01_100418	Date/Time Analyzed:	10/10/18 11:28 PM
Lab ID:	1810150B-07A	Dilution Factor:	2.45
Date/Time Collected:	10/4/18 07:06 AM	Instrument/Filename:	msdp.i / p101022
Media:	1 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	1.6	2.9	4.8	Not Detected
1,4-Dioxane	123-91-1	2.6	14	18	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.97	2.9	4.8	Not Detected
Tetrachloroethene	127-18-4	1.2	5.0	8.3	Not Detected
trans-1,2-Dichloroethene	156-60-5	2.0	2.9	4.8	Not Detected
Trichloroethene	79-01-6	1.2	3.9	6.6	1.5 J
Vinyl Chloride	75-01-4	0.50	1.9	3.1	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	102
4-Bromofluorobenzene	460-00-4	70-130	102
Toluene-d8	2037-26-5	70-130	102

EPA METHOD TO-15 GC/MS FULL SCAN
Ford

Client ID:	SSMP-11897BeldenCt-02_100418	Date/Time Analyzed:	10/10/18 11:54 PM
Lab ID:	1810150B-08A	Dilution Factor:	2.29
Date/Time Collected:	10/4/18 07:50 AM	Instrument/Filename:	msdp.i / p101023
Media:	1 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	1.5	2.7	4.5	Not Detected
1,4-Dioxane	123-91-1	2.5	13	16	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.91	2.7	4.5	Not Detected
Tetrachloroethene	127-18-4	1.1	4.7	7.8	Not Detected
trans-1,2-Dichloroethene	156-60-5	1.9	2.7	4.5	Not Detected
Trichloroethene	79-01-6	1.1	3.7	6.2	Not Detected
Vinyl Chloride	75-01-4	0.47	1.8	2.9	Not Detected

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	103
Toluene-d8	2037-26-5	70-130	101

EPA METHOD TO-15 GC/MS FULL SCAN
Ford

Client ID:	SSMP-11897BeldenCt-03_100418	Date/Time Analyzed:	10/11/18 12:21 AM
Lab ID:	1810150B-09A	Dilution Factor:	2.34
Date/Time Collected:	10/4/18 08:27 AM	Instrument/Filename:	msdp.i / p101024
Media:	1 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	1.6	2.8	4.6	Not Detected
1,4-Dioxane	123-91-1	2.5	13	17	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.93	2.8	4.6	Not Detected
Tetrachloroethene	127-18-4	1.1	4.8	7.9	Not Detected
trans-1,2-Dichloroethene	156-60-5	1.9	2.8	4.6	Not Detected
Trichloroethene	79-01-6	1.1	3.8	6.3	Not Detected
Vinyl Chloride	75-01-4	0.48	1.8	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	102
4-Bromofluorobenzene	460-00-4	70-130	95
Toluene-d8	2037-26-5	70-130	101

EPA METHOD TO-15 GC/MS FULL SCAN
Ford

Client ID:	SSMP-DUP-02_100418	Date/Time Analyzed:	10/11/18 12:47 AM
Lab ID:	1810150B-10A	Dilution Factor:	2.32
Date/Time Collected:	10/4/18 08:46 AM	Instrument/Filename:	msdp.i / p101025
Media:	1 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	1.6	2.8	4.6	Not Detected
1,4-Dioxane	123-91-1	2.5	13	17	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.92	2.8	4.6	Not Detected
Tetrachloroethene	127-18-4	1.1	4.7	7.9	Not Detected
trans-1,2-Dichloroethene	156-60-5	1.9	2.8	4.6	Not Detected
Trichloroethene	79-01-6	1.1	3.7	6.2	Not Detected
Vinyl Chloride	75-01-4	0.47	1.8	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	100
4-Bromofluorobenzene	460-00-4	70-130	96
Toluene-d8	2037-26-5	70-130	102

EPA METHOD TO-15 GC/MS FULL SCAN
Ford

Client ID:	Lab Blank	Date/Time Analyzed:	10/10/18 11:01 AM
Lab ID:	1810150B-11A	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msdp.i / p101008a
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	0.67	1.2	2.0	Not Detected
1,4-Dioxane	123-91-1	1.1	5.8	7.2	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.40	1.2	2.0	Not Detected
Tetrachloroethene	127-18-4	0.47	2.0	3.4	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.83	1.2	2.0	Not Detected
Trichloroethene	79-01-6	0.48	1.6	2.7	Not Detected
Vinyl Chloride	75-01-4	0.20	0.77	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	101
4-Bromofluorobenzene	460-00-4	70-130	96
Toluene-d8	2037-26-5	70-130	98

EPA METHOD TO-15 GC/MS FULL SCAN
 Ford

Client ID:	CCV	Date/Time Analyzed:	10/10/18 09:38 AM
Lab ID:	1810150B-12A	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msdp.i / p101005
Media:	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	102
1,4-Dioxane	123-91-1	91
cis-1,2-Dichloroethene	156-59-2	105
Tetrachloroethene	127-18-4	101
trans-1,2-Dichloroethene	156-60-5	104
Trichloroethene	79-01-6	94
Vinyl Chloride	75-01-4	104

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	105
4-Bromofluorobenzene	460-00-4	70-130	104
Toluene-d8	2037-26-5	70-130	99

EPA METHOD TO-15 GC/MS FULL SCAN
Ford

Client ID:	LCS	Date/Time Analyzed:	10/10/18 10:04 AM
Lab ID:	1810150B-13A	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msdp.i / p101006
Media:	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	106
1,4-Dioxane	123-91-1	100
cis-1,2-Dichloroethene	156-59-2	95
Tetrachloroethene	127-18-4	100
trans-1,2-Dichloroethene	156-60-5	112
Trichloroethene	79-01-6	96
Vinyl Chloride	75-01-4	119

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	105
4-Bromofluorobenzene	460-00-4	70-130	104
Toluene-d8	2037-26-5	70-130	103

* % Recovery is calculated using unrounded analytical results.

EPA METHOD TO-15 GC/MS FULL SCAN
Ford

Client ID:	LCSD	Date/Time Analyzed:	10/10/18 10:31 AM
Lab ID:	1810150B-13AA	Dilution Factor:	1.00
Date/Time Collected:	NA - Not Applicable	Instrument/Filename:	msdp.i / p101007
Media:	NA - Not Applicable		

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	103
1,4-Dioxane	123-91-1	104
cis-1,2-Dichloroethene	156-59-2	94
Tetrachloroethene	127-18-4	98
trans-1,2-Dichloroethene	156-60-5	114
Trichloroethene	79-01-6	98
Vinyl Chloride	75-01-4	113

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	100
4-Bromofluorobenzene	460-00-4	70-130	105
Toluene-d8	2037-26-5	70-130	101

* % Recovery is calculated using unrounded analytical results.



October 16, 2018

Kris Hinskey
Arcadis Inc
10559 Citation Ave
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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: 1810150B
Sample date: 2018-10-04
Report received by CADENA: 2018-10-15
Initial Data Verification completed by CADENA: 2018-10-16

4 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.