MEMO

ARCADIS Design & Consultancy for natural and built assets

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From:
Kris Hinskey

Date:
December 13, 2019

Arcadis Project No.:
30016340

Subject:
Livonia Transmission Plant
36200 Plymouth Road, Livonia, Wayne County, Michigan
EGLE Site ID No. 82002970
Response to EGLE Comments for 12001 Stark Received December 9, 2019

On behalf of Ford Motor Company (Ford), Arcadis of Michigan, LLC (Arcadis) has prepared this response to comments received from the Michigan Department of Environment, Great Lakes, and Energy (EGLE) via email on December 9, 2019. The email received from EGLE discusses two specific residential properties located east of the Livonia Transmission Plant (LTP) site (the site).

The original comments from EGLE are listed below in italics with responses to each to follow.

Comment on 34934 Standish

At 34934 Standish where there was an indoor air exceedance in the garage in October 2019; DHHS said that since previous sampling did not detect this, that they are only requesting expedited re-sampling of this location. Please schedule re-sampling of this location and provide results to EGLE and DHHS ASAP.

Response on 34934 Standish

Arcadis is working on scheduling a resampling event at 34934 Standish as soon as possible that will include the resampling of all locations (sub-slab, indoor, and ambient air).

During the chemical inventory for the October 2019 vapor intrusion sampling event, the homeowner removed chemicals from the garage on his own that included aerosol cleaners, solvents, and household products and placed them in his own tote. Arcadis then placed these chemicals in an Arcadis tote and stored the tote outside of the garage. No products containing trichloroethene were noted during the chemical inventory. The property owner indicated that all chemicals from the garage were placed in the tote he provided Arcadis. The property owner would not allow Arcadis to perform a chemical inventory in the garage to identify potential additional sources of volatile organic compounds (VOCs). The property owner indicated to Arcadis that what he provided was sufficient in order to complete the testing. The property owner did however, allow Arcadis access to properly place the indoor air cannisters in the same lo cations as previous rounds of sampling were conducted.

Comment on 12001 Stark

At 12001 Stark DHHS and EGLE noted there have been exceedances in the sub-slab soil gas from several rounds of sampling. The exceedances are well above the criteria for PCE and presumptive mitigation of this residence is requested from Ford on an expedited basis by DHHS.

Response on 12001 Stark

Arcadis has reviewed available data collected from 12001 Stark and the surrounding residential properties based on the request detailed above from EGLE and Michigan Department of Human Health and Services (MDHHS). Multiple lines of evidence are available including chemical usage at this property, past vapor intrusion sampling results, groundwater sampling results, and vapor intrusion sampling results from the neighboring properties. These multiple lines of evidence indicate the tetrachloroethene (PCE) noted in sub-slab soil gas at 12001 Stark is the result of activities at the property and is not related to the site. Each line of evidence is discussed below.

Three rounds of vapor intrusion sampling have been completed at 12001 Stark on October 30, 2018, April 18, 2019, and November 13, 2019. Arcadis provided EGLE and the MDHHS a 24-hour notification email on November 10, 2018, September 6, 2019, and November 13, 2019 due to exceedances of PCE above the Recommended Interim Action Screening Levels (RIASL). The 24-hour notifications provided evidence that the PCE exceedances in sub-slab soil gas collected from the permanent sub-slab monitoring point in the garage were not related to the vinyl chloride impacts east of the site. In addition, there have been no exceedances of PCE in indoor air samples collected at the property, only low-level detections (0.70 J micrograms per cubic meter (ug/m^3)– 1.4 ug/m^3). The emails are included in **Attachment 1** and the data packages have been included in **Attachment 2**. Due to quality assurance and quality control issues, the first round of data has been removed from the data set, but the results were similar to the second and third round of vapor intrusion sampling.

During the building survey and chemical inventory, it was noted that the homeowner keeps various degreasers and cleaners on shelves in the garage that could be a source of PCE. The garage was also observed to have cracks and floor drains. Based on these observations, there is a potential for products from the garage to contribute to the sub-slab detections.

In addition, all sample results for sump water, sub-slab, indoor air, and ambient air samples collected from all rounds of vapor intrusion sampling at all properties surrounding 12001 Stark (12033 Stark, 12034 Boston Post, 12036 Brewster, and 34380 Capitol Street) have never exceeded applicable criteria for PCE or any other target constituent of concern, refer to **Table 1**.

Finally, groundwater samples were collected on September 23, 2019 and September 20, 2019 from groundwater wells MW-106S and MW-167S, respectively. Refer to **Figure 1** for the monitoring well locations. MW-106S is located upgradient of the property and MW-167S is located on the property. PCE was not detected in MW-106S or MW-167S (laboratory detection limit = 1 microgram per liter (ug/L), method detection limit = 0.15 ug/L for both groundwater wells). The source of the PCE in soil gas does not appear to be related to groundwater. Based on Henry's Law at 15 degrees Celsius, a concentration of ~4.67 - 5.83 ug/L would be needed to generate the 2,400 - 2,500 ug/m^3 noted in sub-slab soil gas beneath the garage.

Three to ten rounds of groundwater sampling have been collected to date from 122 monitoring wells that h ave been installed east of the site within the Alden Village. PCE has never exceeded site-specific criteria in any of the monitoring wells within Alden Village. Refer to **Attachment** 3 that contains all analytical results collected to date.

Multiple lines of evidence clearly indicate that the PCE exceedances identified in sub-slab soil gas sample results collected from under the slab of the garage are not related to the vinyl chloride groundwater impacts in the Alden Village Subdivision. Therefore, the request from MDHHS to install a preemptive mitigation system for this property is not warranted.

Enclosures:

Tables

1 Table 1 – Residential Vapor Intrusion Analytical Results

Figures

1 Residential Monitoring Wells

Attachments

1 Livonia Transmission Plant - 24 Hr Notices

2 12001 Stark Road Data Packages

3 Off-Site Groundwater Analytical Data

TABLE

Table 1
Vapor Intrusion Analytical Results
Ford Livonia
Transmission Plant

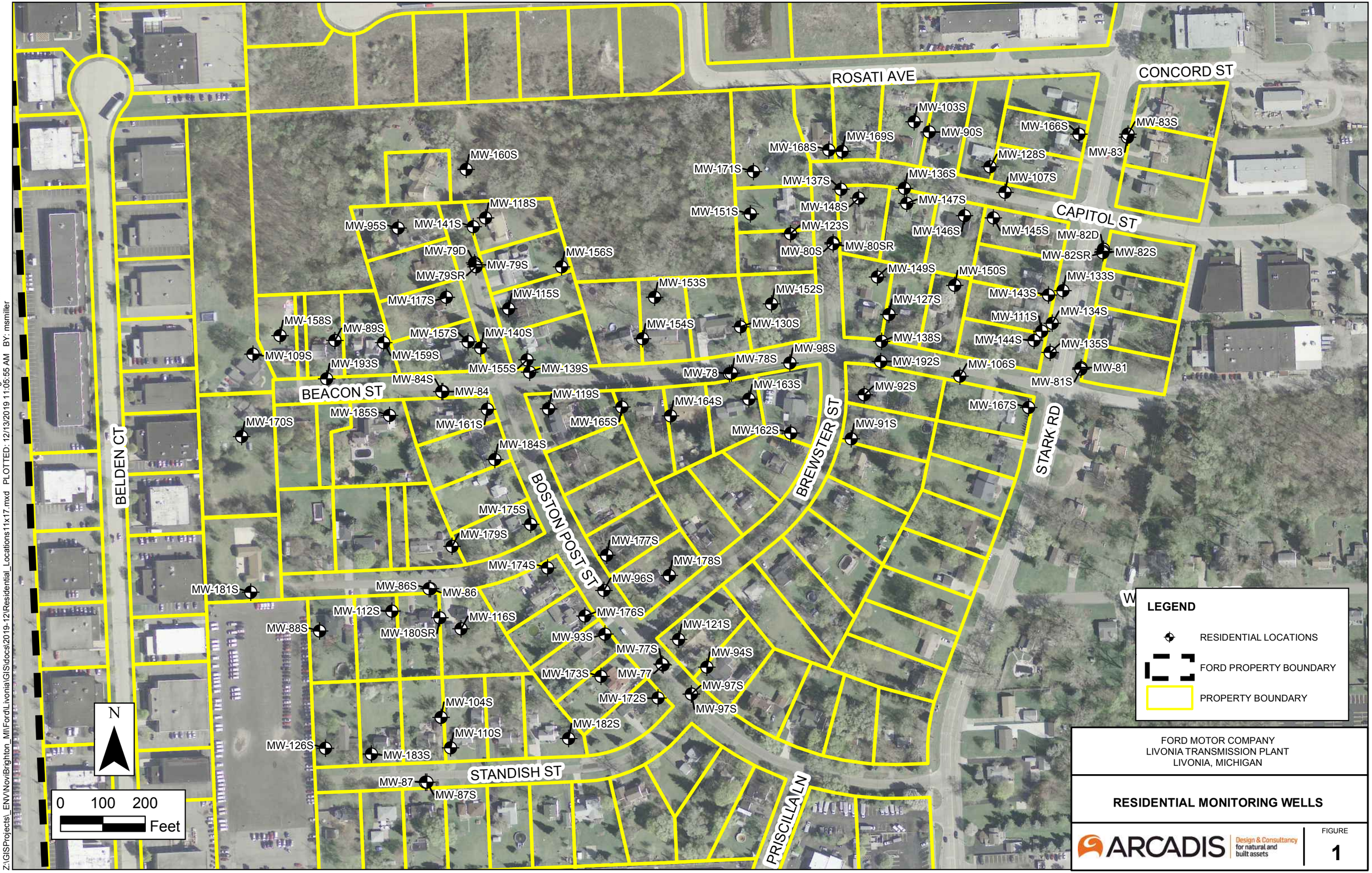
						COC	1,1-Dichloro-ethene	1,4-Dioxane	cis-1,2-Dichloro-ethene	Tetrachloro-ethene	trans-1,2-Dichloro-ethene	Trichloro-ethene	Vinyl chloride
						Unit	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3
						Residential Volatilization to Indoor Air RIASLs (Indoor/Ambient Air) - Provided 7/22/2017 in CD (Residential Indoor Air) (ug/m3):	210	5.1	8.3	41	270	2.0	1.6
						Residential Volatilization to Indoor Air Criteria - house with a basement. Provided by MDEQ 10/30/2018 (Residential Soil Gas) (ug/m3):	7000	170	280	1400	2800	67	54
						Offsite Residential Drinking Water (ug/L):	7.0	7.2	70	5.0	100	1.0	1.0
Location	Sample Date	Sample Type	Sample Location	Matrix	Parent Sample								
12034 Boston Post Rd	10/22/2018	N	SUMP-12034 BOSTON POST-102218	WG			< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
12034 Boston Post Rd	10/23/2018	N	AA-12034BOSTONPOST-01_102218	AA			R	R	R	R	R	R	R
12034 Boston Post Rd	10/23/2018	N	IACS-12034BOSTONPOST-01_102218	AI			R	R	R	R	R	R	R
12034 Boston Post Rd	10/23/2018	N	IACS-12034BOSTONPOST-02_102218	AI			R	R	R	R	R	R	R
12034 Boston Post Rd	10/23/2018	N	IAF-12034BOSTONPOST-01_102218	AI			R	R	R	R	R	R	R
12034 Boston Post Rd	10/23/2018	N	IAG-12034BOSTONPOST-01_102218	AI			R	R	R	R	R	R	R
12034 Boston Post Rd	10/23/2018	N	SSMP-12034BOSTONPOST-01_102318	GS			R	R	R	R	R	R	R
12034 Boston Post Rd	10/23/2018	N	SSMP-12034BOSTONPOST-02_102318	GS			R	R	R	R	R	R	R
12034 Boston Post Rd	3/5/2019	N	SUMP-12034BOSTONPOST-01_030519	WG			< 1.0	< 2.0	< 1.0	< 1.0 J	< 1.0	< 1.0 J	< 1.0
12034 Boston Post Rd	3/6/2019	N	AA-12034BOSTONPOST-01_030519	AA			< 0.65	< 0.59	< 0.65	< 1.1	< 0.65	< 0.89	< 0.42
12034 Boston Post Rd	3/6/2019	N	IAF-12034BOSTONPOST-01_030519	AI			< 0.66	< 0.60	< 0.66	< 1.1	< 0.66	< 0.90	< 0.43
12034 Boston Post Rd	3/6/2019	N	IAG-12034BOSTONPOST-01_030519	AI			< 0.67	< 0.61	< 0.67	< 1.1	< 0.67	< 0.91	< 0.43
12034 Boston Post Rd	3/6/2019	N	SSMP-12034BOSTONPOST-01_030619	GS			< 4.6	< 17	< 4.6	2.9 J	< 4.6	< 6.3	< 3.0
12034 Boston Post Rd	3/6/2019	N	SSMP-12034BOSTONPOST-02_030619	GS			< 4.8	< 17	< 4.8	11	< 4.8	< 6.5	< 3.1
12034 Boston Post Rd	10/23/2019	N	AA-12034BOSTONPOST-01_102319	AA			< 0.67	< 0.61	< 0.67	< 1.2	< 0.67	< 0.91	< 0.43
12034 Boston Post Rd	10/23/2019	N	IAF-12034BOSTONPOST-01_102319	AI			< 0.70	< 0.63	< 0.70	< 1.2	< 0.70	< 0.94	< 0.45
12034 Boston Post Rd	10/23/2019	N	IAG-12034BOSTONPOST-01_102319	AI			< 0.63	< 0.58	< 0.63	< 1.1	< 0.63	< 0.86	< 0.41
12034 Boston Post Rd	10/23/2019	N	SSMP-12034BOSTONPOST-01_102319	GS			< 5.0	< 18	< 5.0	6.0 J	< 5.0	< 6.8	< 3.2
12034 Boston Post Rd	10/23/2019	FD	DUP-12034BOSTONPOST-01_102319	GS	SSMP-12034BOSTONPOST-01_102319		< 5.3	< 19	< 5.3	6.4 J	< 5.3	< 7.2	< 3.4
12034 Boston Post Rd	10/23/2019	N	SSMP-12034BOSTONPOST-02_102319	GS			< 5.2	< 19	< 5.2	18	< 5.2	< 7.1	< 3.4
12034 Boston Post Rd	10/23/2019	N	SUMP-12034BOSTONPOST-01_102319	WG			< 1.0	1.0 J	0.34 J	< 1.0	< 1.0	< 1.0	< 1.0
12036 Brewster	10/24/2018	N	AA-12036BREWSTER-01_102318	AA			< 0.74	< 0.67	< 0.74	< 1.3	< 0.74	< 1.0	< 0.48
12036 Brewster	10/24/2018	N	IAB-12036BREWSTER-02_102318	AI			R	R	R	R	R	R	R
12036 Brewster	10/24/2018	N	IAF-12036BREWSTER-01_102318	AI			< 0.65	0.53 J	< 0.65	< 1.1	< 0.65	< 0.88	< 0.42
12036 Brewster	10/24/2018	N	IAG-12036BREWSTER-03_102318	AI			< 0.63	< 0.57	< 0.63	< 1.1	< 0.63	< 0.85	< 0.40
12036 Brewster	10/24/2018	N	SSMP-12036BREWSTER-01_102418	GS			R	R	R	R	R	R	R
12036 Brewster	3/1/2019	N	AA-12036BREWSTER-01_022819	AA			< 0.58	< 0.53	< 0.58	0.20 J	< 0.58	1.1	< 0.38
12036 Brewster	3/1/2019	N	IAB-12036BREWSTER-02_022819	AI			< 0.68	< 0.62	< 0.68	< 1.2	< 0.68	0.37 J	0.18 J
12036 Brewster	3/1/2019	N	IAF-12036BREWSTER-01_022819	AI			< 0.70	< 0.64	< 0.70	0.20 J	< 0.70	< 0.95	0.20 J
12036 Brewster	3/1/2019	N	IAG-12036BREWSTER-03_022819	AI			< 0.65	< 0.59	< 0.65	< 1.1	< 0.65	0.17 J	< 0.42
12036 Brewster	3/1/2019	N	SSMP-12036BREWSTER-01_030119	GS			< 4.9	< 18	< 4.9	2.0 J	< 4.9	< 6.7	< 3.2
12036 Brewster	5/31/2019	N	AA-12036BREWSTER-01_053019	AA			< 0.71	< 0.65	< 0.71	0.11 J	< 0.71	< 0.97	< 0.46
12036 Brewster	5/31/2019	N	IAB-12036BREWSTER-02_053019	AI			< 0.66	< 0.60	< 0.66	< 1.1	< 0.66	< 0.89	0.61
12036 Brewster	5/31/2019	FD	DUP-12036BREWSTER-01_053019	AI	IAB-12036BREWSTER-02_053019		< 0.79	< 0.72	< 0.79	< 1.3	< 0.79	< 1.1	0.64
12036 Brewster	5/31/2019	N	IAF-12036BREWSTER-01_053019	AI			< 0.67	< 0.61	< 0.67	0.18 J	< 0.67	< 0.91	0.48
12036 Brewster	5/31/2019	N	IAG-12036BREWSTER-03_053019	AI			< 1.7	< 1.5	< 1.7	< 2.9	< 1.7	0.40 J	< 1.1
12036 Brewster	5/31/2019	N	SSMP-12036BREWSTER-01_053119	GS			< 5.1	< 18	< 5.1	16	< 5.1	< 6.9	< 3.3
12036 Brewster	9/5/2019	N	AA-12036BREWSTER-01_090519	AA			< 0.70	< 0.64	< 0.70	< 1.2	< 0.70	< 0.96	< 0.46
12036 Brewster	9/5/2019	N	IAB-12036BREWSTER-02_090519	AI			< 0.65	0.12 J	< 0.65	< 1.1	< 0.65	< 0.88	< 0.42
12036 Brewster	9/5/2019	N	IAF-12036BREWSTER-02_090519	AI			< 0.67	0.16 J	< 0.67	< 1.2	< 0.67	< 0.91	< 0.43
12036 Brewster	9/5/2019	N	IAG-12036BREWSTER-03_090519	AI			< 0.67	0.10 J	< 0.67	< 1.1	< 0.67	0.30 J	< 0.43
12036 Brewster	9/5/2019	N	SSMP-12036BREWSTER-01_090519	GS			< 4.8	< 17	< 4.8	4.0 J	< 4.8	< 6.5	< 3.1
34380 Capitol St	10/17/2018	N	SUMP-34380 CAPITOL-01-101718	WG			< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
34380 Capitol St	10/18/2018	N	AA-34380CAPITAL-01_101718	AA			< 0.63	< 0.57	< 0.63	0.56 J	< 0.63	0.47 J	< 0.41
34380 Capitol St	10/18/2018	N	IAB-34380CAPITAL-03_101718	AI			< 0.65	< 0.59	< 0.65	< 1.1	< 0.65	0.38 J	< 0.42
34380 Capitol St	10/18/2018	N	IAF-34380CAPITAL-02_101718	AI			< 0.71	< 0.64	< 0.71	< 1.2	< 0.71	< 0.96	< 0.46
34380 Capitol St	10/18/2018	N	IAG-34380CAPITAL-01_101718	AI			< 0.63	< 0.57	< 0.63	< 1.1	< 0.63	< 0.85	< 0.40
34380 Capitol St	10/18/2018	N	SSMP-34380CAPITAL-01_101818	GS			< 4.7	< 17	< 4.7	3.1 J	< 4.7	1.5 J	< 3.0
34380 Capitol St	2/28/2019	N	SUMP-34380CAPITOL-01-022819	WG			< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
34380 Capitol St	3/1/2019	N	IAB-34380CAPITAL-03_022819	AI			< 0.68	< 0.62	< 0.68	0.20 J	< 0.68	< 0.92	< 0.44
34380 Capitol St	3/1/2019	N	IAF-34380CAPITAL-02_022819	AI			< 0.68	< 0.62	< 0.68	0.20 J	< 0.68	< 0.92	< 0.44
34380 Capitol St	3/1/2019	N	IAG-34380CAPITAL-01_022819	AI			< 0.68	1.6	< 0.68	1.8	< 0.68	< 0.92	< 0.44
34380 Capitol St	3/1/2019	N	SSMP-34380CAPITAL-01_030119	GS			< 4.8	< 18	< 4.8	6.0 J	< 4.8	< 6.5	< 3.1
34380 Capitol St	6/12/2019	N	AA-34380CAPITOL-01_061119	AA			< 0.74	< 0.67	< 0.74	< 1.3	< 0.74	< 1.0	< 0.48
34380 Capitol St	6/12/2019	N	IAB-34380CAPITOL-03_061119	AI			< 0.67	< 0.60	< 0.67	< 1.1	2.1	< 0.90	< 0.43
34380 Capitol St	6/12/2019	FD	DUP-34380CAPITOL-01_061119	AI	IAB-34380CAPITOL-03_061119		< 0.68	< 0.62	< 0.68	< 1.2	2.5	< 0.92	< 0.44
34380 Capitol St	6/12/2019	N	IAF-34380CAPITOL-02_061119	AI			< 0.72	< 0.66	< 0.72	< 1.2	< 0.72	< 0.20	< 0.47
34380 Capitol St	6/12/2019	N	IAG-34380CAPITOL-01_061119	AI			< 0.74	< 0.67	< 0.74	< 1.3	< 0.74	< 1.0	< 0.48
34380 Capitol St	6/12/2019	N	SSMP-34380CAPITOL-01_061219	GS			< 5.0	< 18	< 5.0	5.2 J	< 5.0	< 6.8	< 3.2
34380 Capitol St	6/12/2019	N	SUMP-34380CAPITOL-01_061219	WG			< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
34380 Capitol St	9/25/2019	N	AA-34380CAPITOL-01_092519	AA			< 0.71	< 0.64	< 0.71	< 1.2	< 0.71	< 0.96	< 0.46
34380 Capitol St	9/25/2019	N	IAB-34380CAPITOL-03_092519	AI			< 0.72	0.13 J	< 0.72	< 1.2	< 0.72	< 0.98	< 0.46
34380 Capitol St	9/25/2019	N	IAF-34380CAPITOL-02_092519	AI			< 0.72	< 0.65	< 0.72	< 1.2	< 0.72	< 0.97	< 0.46
34380 Capitol St	9/25/2019	N	IAG-34380CAPITOL-01_092519	AI			< 0.75	0.12 J	< 0.75	< 1.3	< 0.75	< 1.0	< 0.48
34380 Capitol St	9/25/2019	N	SSMP-34380CAPITOL-01_092519	GS			< 5.1	< 18	< 5.1	6.1 J	< 5.1	< 6.9	< 3.3
34380 Capitol St	9/25/2019	N	SUMP-34380CAPITOL-01_092519	WG			< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
12033 Stark Rd	3/20/2019	N	AA-12033STARK-01_031919	AA			< 0.71	0.10 J	< 0.71	0.18 J	< 0.71	< 0.96	< 0.46
12033 Stark Rd	3/20/2019	FD	DUP-12033STARK-01_031919	AA	AA-12033STARK-01_031919		< 0.61	< 0.56	< 0.61	0.17 J	< 0.61	< 0.83	< 0.40
12033 Stark Rd	3/20/2019	N	IAG-12033STARK-03_031919	AI			< 0.67	< 0.60	< 0.67	0.17 J	< 0.67	< 0.90	< 0.43
12033 Stark Rd	3/20/2019	FD	DUP-12033STARK-02_031919	AI	IAG-12033STARK-03_031919		< 0.63	< 0.57	< 0.63	< 1.1	< 0.63	< 0.85	< 0.40
12033 Stark Rd	3/20/2019	N	IAF-12033STARK-01_031919	AI			< 0.68	< 0.62	< 0.68	0.16 J	< 0.68	< 0.92	< 0.44
12033 Stark Rd	3/20/2019	N	IAF-12033STARK-02_031919	AI			< 0.69	< 0.63	< 0.69	< 1.2	< 0.69	< 0.94	< 0.45
12033 Stark Rd	3/20/2019	N	SSMP-12033STARK-01_032019	GS			< 4.6	< 17	< 4.6	11	< 4.6	< 6.3	< 3.0
12033 Stark Rd	3/20/2019	N	SSMP-12033STARK-02_032019	GS			< 4.9	< 18	< 4.9	< 8.4	< 4.9	< 6.6	< 3.2
12033 Stark Rd	7/2/2019	N	IAF-12033STARK-02_070119	AI			< 0.71	< 0.64	< 0.71	< 1.2	< 0.71	< 0.96	< 0.46
12033 Stark Rd	7/2/2019	FD	DUP-12033STARK-01_070119	AI	IAF-12033STARK-02_070119		< 0.71	< 0.64	< 0.71	< 1.2	< 0.71	< 0.96	< 0.46
12033 Stark Rd	7/2/2019	N	IAF-12033STARK-01_070119	AI			< 0.71	< 0.64	< 0.71	< 1.2	< 0.71	< 0.96	< 0.46
12033 Stark Rd	7/2/2019	N	IAG-12033STARK-03_070119	AI			< 0.71	< 0.64	< 0.71	< 1.2	< 0.71	< 0.96	< 0.46
12033 Stark Rd	7/2/2019	N	SSMP-12033STARK-01_070219	GS			< 5.0	< 18	< 5.0	< 8.5 UB	< 5.0	< 6.8	< 3.2
12033 Stark Rd	7/2/2019	N	SSMP-12033STARK-02_070219	GS			< 5.0	< 18	< 5.0	< 11 UB	< 5.0	3.4 J	< 3.2

Abbreviations:

N	Normal
NA	Not Applicable
FD	Field Duplicate
COC	Chain of Custody
ug/m3	Microgram per cubic meter
AA	Ambient Air
IA	Indoor Air
SSMP	Subslab Monitoring Point
GS	Subslab Soil Gas
SDG	Sample Delivery Group
J	Estimated result
<	Denotes not detected above reporting limit.
UB	Analyte considered non-detect at the listed value due to associated blank contamination
B	Compound also found in blank
Bold	Result exceeds Residential Volatilization to Indoor Air Criteria - house with a basement. Provided by MDEQ 10/30/2018 (Soil Gas) (Residential) or result exceeds the Residential Volatilization to Indoor Air RIASLs (Indoor/Ambient Air) - Provided 7/22/2017 in CD (residential).

Notes: Analytical method is modified EPA Method TO-15 GC/MS

FIGURE



FORD MOTOR COMPANY
LIVONIA TRANSMISSION PLANT
LIVONIA, MICHIGAN

RESIDENTIAL MONITORING WELLS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 1

CITY: Novi DIV: ENV DB: MG PROJECT NUMBER: MI001454.0007.00004 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet Intl
Z:\GISProjects_ENV\NoviBrighton_MIFordLivonia\GIS\docs\2019-12\Residential_Locations11x17.mxd PLOTTED: 12/13/2019 11:05:55 AM BY: msmiller

ATTACHMENT 1

Livonia Transmission Plant - 24 Hr Notices

Archived: Friday, December 13, 2019 2:05:33 PM
From:
To:
Cc:
Subject: Livonia Transmission Plant - 24 Hr Notice
Sensitivity: Normal
Attachments:
E203631_1811046A_20181031_report.pdf E203631_1811046B_20181031_report.pdf

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Brandon –

This email serves as the 24-hour notification for an exceedance as it relates to offsite vapor intrusion assessment conducted under the approval letter provided by the MDEQ for the VI RespAP.

Analytical results collected at 12001 Stark (residential property) were received and reviewed yesterday. The results indicated an exceedance of tetrachloroethene in soil gas collected at SSMP-01, which is located in the garage. Indoor air samples were collected in the crawl space of the home, first floor of the home, and within the garage. The indoor air results indicated that there were **no exceedances** and only low detections for tetrachloroethene.

The property owner will be notified of the exceedance and next steps will be discussed with the MDEQ.

Thank you

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ARCADIS Design & Consultancy for natural and built assets

Archived: Friday, December 13, 2019 2:05:39 PM
From:
To:
Cc:
Subject: RE: Livonia Transmission Plant - Notification 12001 Stark
Sensitivity: Normal

Correction the address is 12001 Stark.

Thank you

From: Hinskey, Kristoffer
Sent: Friday, September 6, 2019 7:35 PM
To: Brandon Alger (AlgerB@michigan.gov) <AlgerB@michigan.gov>
Cc: 'Vens, Beth (DEQ)' <VENSB@michigan.gov>; 'Rafalski, Alexandra (DHHS)' <RafalskiA@michigan.gov>; 'Cooch, Aaron (DHHS-Contractor)' <CoochA@michigan.gov>; 'Merritt, Lawrence (L.H.)' <lmerrit2@ford.com>; Walton, Todd (T.M.) <twalton@ford.com>; Pinter, Chuck (C.H.) <cpinter@ford.com>; Quinnan, Joseph <Joseph.Quinnan@arcadis.com>
Subject: Livonia Transmission Plant - Notification 12001 Bost Post

Brandon –

We are writing to notify EGLE of an exceedance of screening levels for sub-slab soil vapor for an assessment conducted under the approval letter provided by the EGLE for the VI RespAP.

Analytical results from the residential property at 12001 Stark indicated that PCE was detected in sub-slab soil vapor collected from the garage above the screening level presented by EGLE in the Consent Decree. PCE was detected in the garage (sample SSMP-12001STARK-01_041919) of the home at a concentration of 2,800 ug/m^3, which exceeded the residential screening level of 1,400 ug/m^3. For PCE the sub-slab screening level and the time-sensitive screening level are the same at 1,400 ug/m^3. PCE was detected in indoor air samples collected from the property at very low levels (0.70 J ug/m3 to 1.4 ug/m3), which were well below the indoor air screening level of 41 ug/m3.

A groundwater sample was collected May 20, 2019 from groundwater well MW-167S which is located on the property and tetrachloroethene was not detected (laboratory detection limit = 1 ug/L).

The source of the tetrachloroethene in soil gas is unclear at this point but does not appear to be related groundwater. Based on Henry's Law at 15 degrees C, a concentration of ~6.5 ug/L would be needed to generate the 2,800 ug/m3 noted in sub-slab soil gas beneath the garage.

The property owner was provided the data package (attached), that contains the analytical results.

Thank you

Kris Hinskey | Certified Project Manager | kristoffer.hinskey@arcadis.com
Arcadis | Arcadis of Michigan, LLC
28550 Cabot Drive Suite 500 Novi MI | 48377 | USA
T. +1 269 579 5402

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Archived: Friday, December 13, 2019 2:05:43 PM
From:
To:
Subject: Livonia Transmission Plant - 24 Hr Notification 12001 Stark
Sensitivity: Normal
Attachments:
12001 Stark Data Package.pdf

Brandon -

This email serves as the notification for an exceedance as it relates to offsite vapor intrusion assessment conducted under the approval letter provided by the MDEQ for the VI RespAP.

Analytical results from the residential property at 12001 Stark indicated that tetrachloroethene (PCE) was detected in the sub-slab soil vapor collected from the garage above the screening level presented by EGLE in the Consent Decree. PCE was detected in the garage (sample SSMP-12001STARK-01_101819 and sample duplicate DUP-12001STARK-01_101819) of the home at concentrations of 2,500 ug/m^3 and 2,400 ug/m^3, respectively, which exceed the residential screening level of 1,400 ug/m^3. For PCE, the sub-slab screening level and the time-sensitive screening level are the same at 1,400 ug/m^3. PCE was detected in an indoor air sample collected from the property at a very low level (0.92 J ug/m^3), which is well below the indoor air screening level of 41 ug/m^3. These results have been consistent with the last round of sampling.

Groundwater samples were collected on September 23, 2019 and September 20, 2019 from groundwater wells MW-106S and MW-167S, respectively. MW-106S is located upgradient of the property and MW-167S is located on the property. PCE was not detected in MW-106S or MW-167S (laboratory detection limit = 1 ug/L, method detection limit = 0.15 ug/L for both groundwater wells). The source of the PCE in soil gas does not appear to be related to groundwater. Based on Henry's Law at 15 degrees C, a concentration of ~4.67 - 5.83 ug/L would be needed to generate the 2,400 - 2,500 ug/m^3 noted in sub-slab soil gas beneath the garage.

During the building survey and chemical inventory, it was noted that the homeowner keeps various degreasers and cleaners on shelves in the garage that could be a source of PCE. The garage was also observed to have cracks and floor drains. Negative differential pressure readings were also recorded from the sub-slab monitoring point (-0.00018 iwc) that was sampled. Based on these observations, there is potential for products from the garage to contribute to the sub-slab detections.

Arcadis will continue to evaluate groundwater concentrations upgradient (MW-106S) and downgradient (MW-167S) of the home and will continue the vapor intrusion assessment in 2020.

The property owner was provided the data package (attached) that contains the analytical results.

Thank you

Kris Hinskey | Certified Project Manager | kristoffer.hinskey@arcadis.com
Arcadis | Arcadis of Michigan, LLC
28550 Cabot Drive Suite 500 Novi MI | 48377 | USA
T. +1 269 579 5402

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ARCADIS Design & Consultancy for natural and built assets

ATTACHMENT 2

12001 Stark Road Data Packages

TRANSMITTAL LETTER

ARCADIS Design & Consultancy for natural and built assets

To:
George Al-Husari

From:
Kris Hinskey

Arcadis of Michigan, LLC
28550 Cabot Drive
Suite 500
Novi
Michigan 48377
Tel 248 994 2240
Fax 248 994 2241

Copies:
Shawn Collins
Brandon Alger (MDEQ)
Todd Walton (Ford)
Chuck Pinter (Ford)
Rob Boley (Schiff Hardin LLP)

Date:
November 10, 2018

Subject:
Vapor Intrusion Assessment
Data Package

We are sending you hard copies:

☒ **Attached** ☐ **Under Separate Cover Via _____ the Following Items:**

☐ Shop Drawings ☐ Plans ☐ Specifications ☐ Change Order
☐ Prints ☒ Samples ☐ Copy of Letter ☐ Reports
☐ Other:

Copies	Date	Drawing No.	Rev.	Description	Action*
1	11/13/2018			Analytical Results	
1	11/13/2018			Field Notes and Drawings	

Action*
☐ A Approved
☐ AN Approved As Noted
☐ AS As Requested
☐ CR Correct and Resubmit
☐ F File
☐ FA For Approval
☐ Resubmit _____ Copies
☐ Return _____ Copies
☐ Review and Comment
☐ Other:

Mailing Method
☐ U.S. Postal Service 1st Class ☐ Courier/Hand Delivery ☐ FedEx Priority Overnight ☐ FedEx 2-Day Delivery
☐ Certified/Registered Mail ☐ United Parcel Service (UPS) ☐ FedEx Standard Overnight ☐ FedEx Economy
☒ Other: email

Thank you for cooperating with the air sampling at your property on October 30 and 31, 2018. Attached is your data package.

eurofins | Air Toxics

11/9/2018
Mr. Jim Tomalia
Arcadis U.S., Inc.
28550 Cabot Dr.
Suite 500
Novi MI 48377

Project Name: Ford LTP
Project #:
Workorder #: 1811046A

Dear Mr. Jim Tomalia

The following report includes the data for the above referenced project for sample(s) received on 11/2/2018 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

eurofins | Air Toxics

WORK ORDER #: 1811046A

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:	11/02/2018	**CONTACT:**	Ausha Scott
DATE COMPLETED:	11/09/2018		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	AA-12001Stark-01_103018	Modified TO-15	6.5 "Hg	5.5 psi
02A	IACS-12001Stark-01_103018	Modified TO-15	5.5 "Hg	5.1 psi
03A	IAG12001Stark-02_103018	Modified TO-15	5.5 "Hg	5.1 psi
04A	IAF-12001Stark-03_103018	Modified TO-15	7.1 "Hg	5.2 psi
05A	Lab Blank	Modified TO-15	NA	NA
06A	CCV	Modified TO-15	NA	NA
07A	LCS	Modified TO-15	NA	NA
07AA	LCSD	Modified TO-15	NA	NA

CERTIFIED BY:  DATE: 11/09/18

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

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# 1811046A

Four 6 Liter Summa Canister (100% Certified) samples were received on November 02, 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.

Requirement	***TO-15***	***ATL Modifications***
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

The Chain of Custody (COC) was not relinquished properly. A signature, date and time were not provided by the field sampler.

Analytical Notes

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 LTP

Client ID:	AA-12001Stark-01_103018		
Lab ID:	1811046A-01A	**Date/Time Analyzed:**	11/5/18 06:34 PM
Date/Time Collected:	10/31/18 11:08 AM	**Dilution Factor:**	1.76
Media:	6 Liter Summa Canister (100% Certified)	**Instrument/Filename:**	msd22.i / 22110512

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.13	0.35	0.70	Not Detected
1,4-Dioxane	123-91-1	0.15	0.32	0.63	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.15	0.35	0.70	Not Detected
Tetrachloroethene	127-18-4	0.072	0.60	1.2	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.11	0.35	0.70	Not Detected
Trichloroethene	79-01-6	0.10	0.47	0.94	Not Detected
Vinyl Chloride	75-01-4	0.064	0.22	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	110
4-Bromofluorobenzene	460-00-4	70-130	92
Toluene-d8	2037-26-5	70-130	86

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

Client ID:	IACS-12001Stark-01_103018		
Lab ID:	1811046A-02A	**Date/Time Analyzed:**	11/5/18 07:10 PM
Date/Time Collected:	10/31/18 10:49 AM	**Dilution Factor:**	1.65
Media:	6 Liter Summa Canister (100% Certified)	**Instrument/Filename:**	msd22.i / 22110513

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.12	0.33	0.65	Not Detected
1,4-Dioxane	123-91-1	0.14	0.30	0.59	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.14	0.33	0.65	Not Detected
Tetrachloroethene	127-18-4	0.068	0.56	1.1	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.10	0.33	0.65	Not Detected
Trichloroethene	79-01-6	0.096	0.44	0.89	Not Detected
Vinyl Chloride	75-01-4	0.060	0.21	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	109
4-Bromofluorobenzene	460-00-4	70-130	93
Toluene-d8	2037-26-5	70-130	85

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

Client ID:	IAG12001Stark-02_103018		
Lab ID:	1811046A-03A	**Date/Time Analyzed:**	11/5/18 08:21 PM
Date/Time Collected:	10/31/18 11:06 AM	**Dilution Factor:**	1.65
Media:	6 Liter Summa Canister (100% Certified)	**Instrument/Filename:**	msd22.i / 22110514

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.12	0.33	0.65	Not Detected
1,4-Dioxane	123-91-1	0.14	0.30	0.59	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.14	0.33	0.65	Not Detected
Tetrachloroethene	127-18-4	0.068	0.56	1.1	1.6
trans-1,2-Dichloroethene	156-60-5	0.10	0.33	0.65	Not Detected
Trichloroethene	79-01-6	0.096	0.44	0.89	Not Detected
Vinyl Chloride	75-01-4	0.060	0.21	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	110
4-Bromofluorobenzene	460-00-4	70-130	101
Toluene-d8	2037-26-5	70-130	86

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

Client ID:	IAF-12001Stark-03_103018		
Lab ID:	1811046A-04A	**Date/Time Analyzed:**	11/5/18 08:57 PM
Date/Time Collected:	10/31/18 11:05 AM	**Dilution Factor:**	1.78
Media:	6 Liter Summa Canister (100% Certified)	**Instrument/Filename:**	msd22.i / 22110515

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.13	0.35	0.70	Not Detected
1,4-Dioxane	123-91-1	0.15	0.32	0.64	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.16	0.35	0.70	Not Detected
Tetrachloroethene	127-18-4	0.073	0.60	1.2	0.59 J
trans-1,2-Dichloroethene	156-60-5	0.11	0.35	0.70	Not Detected
Trichloroethene	79-01-6	0.10	0.48	0.96	Not Detected
Vinyl Chloride	75-01-4	0.065	0.23	0.46	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	112
4-Bromofluorobenzene	460-00-4	70-130	106
Toluene-d8	2037-26-5	70-130	86

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

Client ID:	Lab Blank		
Lab ID:	1811046A-05A	**Date/Time Analyzed:**	11/5/18 01:26 PM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd22.i / 22110506a

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.075	0.20	0.40	Not Detected
1,4-Dioxane	123-91-1	0.084	0.18	0.36	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.088	0.20	0.40	Not Detected
Tetrachloroethene	127-18-4	0.041	0.34	0.68	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.062	0.20	0.40	Not Detected
Trichloroethene	79-01-6	0.058	0.27	0.54	Not Detected
Vinyl Chloride	75-01-4	0.036	0.13	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	105
4-Bromofluorobenzene	460-00-4	70-130	88
Toluene-d8	2037-26-5	70-130	85

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

Client ID:	CCV		
Lab ID:	1811046A-06A	**Date/Time Analyzed:**	11/5/18 09:09 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd22.i / 22110502

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	90
1,4-Dioxane	123-91-1	100
cis-1,2-Dichloroethene	156-59-2	92
Tetrachloroethene	127-18-4	112
trans-1,2-Dichloroethene	156-60-5	93
Trichloroethene	79-01-6	112
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	107
4-Bromofluorobenzene	460-00-4	70-130	99
Toluene-d8	2037-26-5	70-130	95

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

Client ID:	LCS		
Lab ID:	1811046A-07A	**Date/Time Analyzed:**	11/5/18 10:01 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd22.i / 22110503

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	92
1,4-Dioxane	123-91-1	102
cis-1,2-Dichloroethene	156-59-2	86
Tetrachloroethene	127-18-4	111
trans-1,2-Dichloroethene	156-60-5	104
Trichloroethene	79-01-6	113
Vinyl Chloride	75-01-4	100

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	99
Toluene-d8	2037-26-5	70-130	96

* % Recovery is calculated using unrounded analytical results.

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

Client ID:	LCSD		
Lab ID:	1811046A-07AA	**Date/Time Analyzed:**	11/5/18 11:18 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd22.i / 22110504

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	93
1,4-Dioxane	123-91-1	101
cis-1,2-Dichloroethene	156-59-2	87
Tetrachloroethene	127-18-4	113
trans-1,2-Dichloroethene	156-60-5	107
Trichloroethene	79-01-6	112
Vinyl Chloride	75-01-4	102

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	100
Toluene-d8	2037-26-5	70-130	96

* % Recovery is calculated using unrounded analytical results.

November 09, 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: 1811046A
Sample date: 2018-10-31
Report received by CADENA: 2018-11-09
Initial Data Verification completed by CADENA: 2018-11-09

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 Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

eurofins | Air Toxics

11/9/2018
Mr. Jim Tomalia
Arcadis U.S., Inc.
28550 Cabot Dr.
Suite 500
Novi MI 48377

Project Name: Ford LTP
Project #:
Workorder #: 1811046B

Dear Mr. Jim Tomalia

The following report includes the data for the above referenced project for sample(s) received on 11/2/2018 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

eurofins | Air Toxics

WORK ORDER #: 1811046B

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:	11/02/2018	**CONTACT:**	Ausha Scott
DATE COMPLETED:	11/09/2018		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
05A	SSMP-12001Stark-01_103118	TO-15	4.9 "Hg	15.6 psi
06A	Lab Blank	TO-15	NA	NA
07A	CCV	TO-15	NA	NA
08A	LCS	TO-15	NA	NA
08AA	LCSD	TO-15	NA	NA

CERTIFIED BY:  DATE: 11/09/18

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP - E8 , LA NELAP - 02089, NH NELAP - 209218, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-18-13, UT NELAP CA009332018-10, VA NELAP - 9505, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005-011, Effective date: 10/18/2018, Expiration date: 10/17/2019.
Eurofins Air Toxics LLC. certifies that the test results contained in this report meet all requirements of the NELAC standards

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

LABORATORY NARRATIVE
EPA Method TO-15
Arcadis U.S., Inc.
Workorder# 1811046B

One 1 Liter Summa Canister sample was received on November 02, 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) was not relinquished properly. A signature, date and time were not provided by the field sampler.

Sample SSMP-12001Stark-01_103118 was not received at Eurofin Air Toxics, LLC on 11/02/18 despite notation on the Chain of Custody (COC). The sample was subsequently received on 11/05/18 and was added to the analytical request.

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.

Dilution was performed on sample SSMP-12001Stark-01_103118 due to the presence of high level target species.

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-12001Stark-01_103118		
Lab ID:	1811046B-05A	**Date/Time Analyzed:**	11/7/18 12:21 AM
Date/Time Collected:	10/31/20 11:18 AM	**Dilution Factor:**	3.08
Media:	1 Liter Summa Canister	**Instrument/Filename:**	msd3.i / 3110621

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	2.2	3.7	6.1	Not Detected
1,4-Dioxane	123-91-1	2.0	11	22	Not Detected
cis-1,2-Dichloroethene	156-59-2	1.3	3.7	6.1	Not Detected
Tetrachloroethene	127-18-4	2.1	6.3	10	3300
trans-1,2-Dichloroethene	156-60-5	1.8	3.7	6.1	Not Detected
Trichloroethene	79-01-6	1.3	5.0	8.3	Not Detected
Vinyl Chloride	75-01-4	2.2	2.4	3.9	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	121
4-Bromofluorobenzene	460-00-4	70-130	100
Toluene-d8	2037-26-5	70-130	101

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

Client ID:	Lab Blank		
Lab ID:	1811046B-06A	**Date/Time Analyzed:**	11/6/18 12:59 PM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd3.i / 3110606c

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.71	1.2	2.0	Not Detected
1,4-Dioxane	123-91-1	0.65	3.6	7.2	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.44	1.2	2.0	Not Detected
Tetrachloroethene	127-18-4	0.68	2.0	3.4	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.59	1.2	2.0	Not Detected
Trichloroethene	79-01-6	0.43	1.6	2.7	Not Detected
Vinyl Chloride	75-01-4	0.72	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	118
4-Bromofluorobenzene	460-00-4	70-130	98
Toluene-d8	2037-26-5	70-130	100

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

Client ID:	CCV		
Lab ID:	1811046B-07A	**Date/Time Analyzed:**	11/6/18 09:22 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd3.i / 3110602

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	97
1,4-Dioxane	123-91-1	102
cis-1,2-Dichloroethene	156-59-2	102
Tetrachloroethene	127-18-4	109
trans-1,2-Dichloroethene	156-60-5	107
Trichloroethene	79-01-6	112
Vinyl Chloride	75-01-4	100

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	106
Toluene-d8	2037-26-5	70-130	101

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

Client ID:	LCS		
Lab ID:	1811046B-08A	**Date/Time Analyzed:**	11/6/18 09:47 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd3.i / 3110603

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	99
1,4-Dioxane	123-91-1	101
cis-1,2-Dichloroethene	156-59-2	95
Tetrachloroethene	127-18-4	104
trans-1,2-Dichloroethene	156-60-5	117
Trichloroethene	79-01-6	112
Vinyl Chloride	75-01-4	102

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	103
Toluene-d8	2037-26-5	70-130	100

* % Recovery is calculated using unrounded analytical results.

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

Client ID:	LCSD		
Lab ID:	1811046B-08AA	**Date/Time Analyzed:**	11/6/18 10:11 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd3.i / 3110604

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	98
1,4-Dioxane	123-91-1	104
cis-1,2-Dichloroethene	156-59-2	90
Tetrachloroethene	127-18-4	104
trans-1,2-Dichloroethene	156-60-5	119
Trichloroethene	79-01-6	112
Vinyl Chloride	75-01-4	105

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	115
4-Bromofluorobenzene	460-00-4	70-130	102
Toluene-d8	2037-26-5	70-130	102

* % Recovery is calculated using unrounded analytical results.

November 09, 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: 1811046B
Sample date: 2018-10-31
Report received by CADENA: 2018-11-09
Initial Data Verification completed by CADENA: 2018-11-09

1 Air samples was 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 Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

Camera #: 2582
starting: 101-0770
ending: 101-0779

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Daily Log

Project No.: MI001454.0003.00002 Page 1 of 1

Site Location: 12001 Stark Rd.

Prepared By: Hayden Ladd

Date	Time	Description of Activities
10-29-18	—	Purpose: Visit 1 - Bldg survey, SSMP install
	—	Arcadis: Hayden Ladd, Donnie Richmond; Fibertec
	—	Weather - Partly cloudy - high 40s - Dusk
	1615	Arcadis on Site; Fibertec on Site
	1620	Conduct Bldg Survey
	1625	Donnie Richmond on Site
	1630	Conduct Soil Boring
	1740	Install SSMP-01 (garage)
	—	*Note - There is an elevated slab inside the house. ~~that~~ It was
	—	decided no SSMP-02 would be installed inside. The slab
	—	inside was ~3.5" thick. The remainder (~2.5') underneath slab
	—	could not be determined.
	1830	Arcadis off Site
	—	*Note - Home owner was unaware of potential time needed
	—	to conduct Visit 1. He notified Arcadis that he needed to leave
	—	and Arcadis ~~wrapped up work~~ left had to stop work.
10-30-18	1205	Onsite (M. Scamp, Z. Westphal, S. Johnson)
	1210	DEQ, K. Hinskey onsite, Resident arrives home
		- Begin deployment
	1237	OFFSITE
~~10/31/18~~	~~1040~~	~~Arcadis onsite (Hayden, Stewart, Zach)~~ ZW
		~~Arcadis offsite~~ ~~* Note: Possible vaping and smoking during 24 hr collection~~ ZW

ZW

ARCADIS | Design & Consultancy for natural and built assets

DAILY LOG

Project No.: MI001454.0003

Page 1 of 1

Site Location: Livonia, MI 12001 Stark Rd.

Prepared By: Hayden Hall

Date	Time	Description of Activities
10-31-18		Purpose: Visit 3 - Canister pick up & SSMP sample
		Arcadis: Hayden Hall, Zach Vestphal, Shantel Johnson
	1040	Weather: light rain showers - 50s
		Arcadis on Site
	1102	Sample SSMP-01 in garage
	1049	Pick up 24 hour canisters (4 total)
	1135	Arcadis off Site
		*Note - Possible vaping and smoking during 24-hour sample period
		- Strong smoke/cologne odor inside house

ARCADIS

Soil Boring Log

Boring No.: SB-1200 (back-up)

Sheet: 1 of 1

Project Name: Ford LTP
Project Number: MI001454.0003
Project Location: Livonia, MI

Date Started: 10/29/10
Date Completed: 10/29/10

Logger: Donald Richmond
Editor:
Weather Conditions: 50°F / Sunny

Depth (feet)	Sample ID & Time	Recovery (in.)	PID (ppm)	USCS Class.	Description
1				7/11, SM	Sand / Top Soil mix - 0.25 - 0.5 mm, well sorted cu 1-3, moist, ~~weak~~ cementation, no reaction
2				5/3	1-2mm Sand, Poorly sorted cu 4-6, wet, weak cementation very loose N value 1-4
3				5/3	1-2mm, wet, very loose N value 1-4, weak cementation, Poorly sorted cu 4 to 6 → water
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

Drilling Co.:
Driller:
Drilling Method:
Drilling Fluid:
Remarks:

Sampling Method:
Sampling Interval: Continuous
Water Level Start: 3.5
Water Level Finish: NA
Converted to Well: ☐ Yes ☐ No
Surface Elev: NA
North Coor: NA
East Coor: NA

Utilities and Structures Checklist

ARCADIS

During the site inspection look for the following: **("YES" requires additional investigation and the utility must be marked properly prior to beginning subsurface intrusive work)**:

Site Inspection	Utility Color Codes	Present
a) Natural gas line present (evidence of a gas meter)?	Yellow	☐ Yes ☐ No
i) Feeder Lines to buildings or homes?		☑ Yes ☐ No
b) Evidence of electric lines:	Red	
i) Conduits to ground from electric meter or along wall?		☑ Yes ☐ No
iii) Conduits from power poles running into ground?		☒ Yes ☑ No
ii) Light poles, electric devices with no overhead lines?		☐ Yes ☐ No
iii) Overhead electric lines present? (See Section I)		☐ Yes ☐ No
c) Evidence of sewer drains:	Green	
i) Restrooms or kitchen on site?		☑ Yes ☐ No
ii) Sewer cleanouts present?		☐ Yes ☑ No
iii) Combined sewer /storm lines or multiple sewer lines?		☐ Yes ☑ No
d) Evidence of water lines:	Blue	
i) Water meter on site or multiple water lines?		☑ Yes ☐ No
ii) Fire hydrants in vicinity of work?		☑ Yes ☐ No
iii) Irrigation systems? (Sprinkler heads, valve boxes, controls in building)		☐ Yes ☑ No
e) Evidence of storm drains:	Green	
i) Open curbside or slotted grate storm drains		☐ Yes ☑ No
ii) Gutter down spouts going into ground		☐ Yes ☑ No
f) Evidence of telecommunication lines:	Orange	
i) Fiber optic warning signs in areas?		☐ Yes ☑ No
iv) Aboveground cable boxes or housings or wires in work area?		☐ Yes ☑ No
g) Underground storage tanks:		
i) Tank pit present, tank vent present?		☐ Yes ☑ No
ii) Product lines running to dispensers/buildings?		☐ Yes ☑ No
h) Do utilities enter or exit existing structures/buildings?		
If Yes, confirm the utility markings outside of structure/building match up.		☑ Yes ☐ No
i) Proposed excavation marked in white?	White	☑ Yes ☐ No
j) Unclassed utilities / anomalies marked in pink?	Pink	☑ Yes ☐ No
k) **Overhead** Utilities/Communication Lines - **Look Up**:		
i) Overhead electrical conduit, pipe chases, cable trays, product lines?		☐ Yes ☑ No
ii) Overhead fire sprinkler system?		☐ Yes ☑ No
l) **Overhead** Power lines in or near the work area:		
i) < 50 kV within 10 ft. of work area?		☐ Yes ☑ No
ii) >50 - 200 kV within 15 ft. of work area?		☐ Yes ☑ No
iii) >200-350 kV within 20 ft. of work area?		☐ Yes ☑ No
iv) >350-500 kV within 25 ft. of work area?		☐ Yes ☑ No
v) >500-750 kV within 35 ft. or work area?		☐ Yes ☑ No
vi) >750-1000 kV within 45 ft. of work area?		☐ Yes ☑ No
m) Other:		
i) Evidence of linear asphalt or concrete repair?		☑ Yes ☐ No
ii) Evidence of linear ground subsidence or change in vegetation?		☐ Yes ☑ No
iii) Unmarked manholes or valve covers in work area?		☐ Yes ☑ No
iv) Warning signs ("Call Before you Dig", etc.) on or adjacent to site?		☐ Yes ☑ No
v) Utility color markings not illustrated in this checklist?	i.e. Purple	☐ Yes ☑ No
n) Has the Utilities & Structures Checklist been reviewed by the PM or Designee		☑ Yes ☐ No

PM or Designee Name: _____

Name and Signature of person completing the checklist: Donald Richmond / [signature]

Date: 10/29/18

Do not perform **mechanized** intrusive work within 30 inches of a utility marking without receiving pre-approval by Corporate H&S .

TRACK

Utilities and Structures Checklist

ARCADIS

During the site inspection look for the following: **("YES" requires additional investigation and the utility must be marked properly prior to beginning subsurface intrusive work)**:

Site Inspection	Utility Color Codes	Present
a) Natural gas line present (evidence of a gas meter)?	Yellow	☑ Yes ☐ No
i) Feeder Lines to buildings or homes?		☑ Yes ☐ No
b) Evidence of electric lines:	Red	
i) Conduits to ground from electric meter or along wall?		☑ Yes ☐ No
iii) Conduits from power poles running into ground?		☒ Yes ☑ No
ii) Light poles, electric devices with no overhead lines?		☐ Yes ☐ No
iii) Overhead electric lines present? (See Section I)		☐ Yes ☐ No
c) Evidence of sewer drains:	Green	
i) Restrooms or kitchen on site?		☑ Yes ☐ No
ii) Sewer cleanouts present?		☐ Yes ☑ No
iii) Combined sewer /storm lines or multiple sewer lines?		☐ Yes ☑ No
d) Evidence of water lines:	Blue	
i) Water meter on site or multiple water lines?		☑ Yes ☐ No
ii) Fire hydrants in vicinity of work?		☐ Yes ☐ No
iii) Irrigation systems? (Sprinkler heads, valve boxes, controls in building)		☐ Yes ☑ No
e) Evidence of storm drains:	Green	
i) Open curbside or slotted grate storm drains		☐ Yes ☑ No
ii) Gutter down spouts going into ground		☐ Yes ☑ No
f) Evidence of telecommunication lines:	Orange	
i) Fiber optic warning signs in areas?		☐ Yes ☑ No
iv) Aboveground cable boxes or housings or wires in work area?		☐ Yes ☑ No
g) Underground storage tanks:		
i) Tank pit present, tank vent present?		☐ Yes ☑ No
ii) Product lines running to dispensers/buildings?		☐ Yes ☑ No
h) Do utilities enter or exit existing structures/buildings?		
If Yes, confirm the utility markings outside of structure/building match up.		☑ Yes ☐ No
i) Proposed excavation marked in white?	White	☑ Yes ☐ No
j) Unclassed utilities / anomalies marked in pink?	Pink	☑ Yes ☐ No
k) **Overhead** Utilities/Communication Lines - **Look Up**:		
i) Overhead electrical conduit, pipe chases, cable trays, product lines?		☐ Yes ☑ No
ii) Overhead fire sprinkler system?		☐ Yes ☑ No
l) **Overhead** Power lines in or near the work area:		
i) < 50 kV within 10 ft. of work area?		☐ Yes ☑ No
ii) >50 - 200 kV within 15 ft. of work area?		☐ Yes ☑ No
iii) >200-350 kV within 20 ft. of work area?		☐ Yes ☑ No
iv) >350-500 kV within 25 ft. of work area?		☐ Yes ☑ No
v) >500-750 kV within 35 ft. or work area?		☐ Yes ☑ No
vi) >750-1000 kV within 45 ft. of work area?		☐ Yes ☑ No
m) Other:		
i) Evidence of linear asphalt or concrete repair?		☑ Yes ☐ No
ii) Evidence of linear ground subsidence or change in vegetation?		☐ Yes ☑ No
iii) Unmarked manholes or valve covers in work area?		☐ Yes ☑ No
iv) Warning signs ("Call Before you Dig", etc.) on or adjacent to site?		☐ Yes ☑ No
v) Utility color markings not illustrated in this checklist?	i.e. Purple	☐ Yes ☑ No
n) Has the Utilities & Structures Checklist been reviewed by the PM or Designee		☑ Yes ☐ No

PM or Designee Name: _____

Name and Signature of person completing the checklist: Donald Richmond / D. Rich

Date: 10/29/18

Do not perform **mechanized** intrusive work within 30 inches of a utility marking without receiving pre-approval by Corporate H&S .

TRACK

Indoor Air Sampling Procedure Via USEPA Method TO-15

INDOOR AIR BUILDING SURVEY AND SAMPLING FORM

Date: 10-29-15 Survey Performed by: Hayden Lull

1. OCCUPANT:

Rent: ____ Own: X

Resident Name: George Tulari

Address: 12001 Stark Rd.

Telephone: Home: 7349687934 Work: ____

Cell: ↗

How long have you lived at this location? Since August 2011

List current occupants/occupation below (attach additional pages if necessary):

Age (If under 18)	Sex (M/F)	Occupation
None		

2. OWNER OR LANDLORD: (If same as occupant, check here ✓ and go to Item No. 3).

Last Name: _____ First Name: _____

Address: _____

City and State: _____

County: _____

Home Phone: _____ Office Phone: _____

INDOOR AIR BUILDING SURVEY AND SAMPLING FORM (continued)

3. SENSITIVE POPULATION:

Daycare/Nursing Home/Hospital/School/Other (specify): None

4. BUILDING CHARACTERISTICS:

Residential/Multi-family Residential/Office/Strip Mall/Commercial/Industrial/School

Describe Building: Residential Year Constructed: _____

Number of floors at or above grade: 1

Number of floors below grade: 0 (full basement/crawl space/slab on grade)

Depth of structure below grade: 0 ft. Basement size: 0 ft²

If the property is residential, what type? (Circle all appropriate responses.)

Ranch	2-Family	3-Family	Raised Ranch
~~Split Level~~	Colonial	Cape Cod	Contemporary
Mobile Home	Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other: _____	

If multiple units, how many? _____

If the property is commercial:

Business type(s) NA

Does it include residences (i.e., multi-use)? Yes No If yes, how many? _____

5. OCCUPANCY:

Is basement/lowest level occupied? (Circle one)

Full-time Occasionally Seldom Almost Never

INDOOR AIR BUILDING SURVEY AND SAMPLING FORM (continued)

Level	General Use (e.g., family room, bedroom, laundry, workshop, storage)
Basement	NA
1st Floor	Kitchen WC
2nd Floor	
3rd Floor	
4th Floor	

(Use additional page(s) as necessary)

6. CONSTRUCTION CHARACTERISTICS: (Circle all that apply.)

a. Above Grade Construction: (Describe type: wood frame, concrete, stone, brick).

b. Basement Type: Full (Crawlspace) Slab Other: _____

c. Basement Floor: Concrete Dirt Stone Other: Sand

d. Finished Basement Floor: Uncovered Covered N/A

If covered, what with? NA

e. Foundation Walls: Poured (Block) Stone Other: _____

f. Foundation Walls: (Unsealed) Sealed Sealed with: _____

g. The Basement is: Wet Damp Dry N/A

h. The Basement is: Finished Unfinished Partially Finished N/A

i. Sump Present (Y / (N)) If yes, how many? NA

Where Discharged? NA

Water in Sump? Yes No (Not Applicable)

INDOOR AIR BUILDING SURVEY AND SAMPLING FORM (continued)

Identify all potential soil vapor entry points and estimated size (e.g., cracks, utility parts, drains).

Are the basement walls or floor sealed with waterproof paint or epoxy coatings? Yes (No)

Type of ground cover outside of building: (Grass) (Concrete) Asphalt Other _____

Is an existing subsurface depressurization (radon) system in place? Yes (No)

If yes, is it active, or passive?

Is a sub-slab vapor/moisture barrier in place? Yes (No)

Type of barrier: NA

7. HEATING, VENTING, and AIR CONDITIONING

Type of heating system(s) used in this building: (Circle all that apply: Note the primary).

(Hot Air Circulation)	Heat Pump	Hot Water Baseboard
Space Heaters	Steam Radiation	Radiant Floor
Electric Baseboard	Wood Stove	Outdoor Wood Boiler
Other:		

The primary type of fuel used is:

(Natural Gas)	Fuel Oil	Kerosene
~~Electric~~	Propane	Solar
Wood	Coal	

Domestic hot water tank fueled by: Natural Gas

Location of Boiler/Furnace: Basement Outdoors (Main Floor) Other _____

INDOOR AIR BUILDING SURVEY AND SAMPLING FORM (continued)

Air Conditioning: (Central Air) Window Units Open Windows None

Are air distribution ducts present? (Yes) No

Is there a whole house fan? (Yes) No

Describe the air intake system (outside air supply, cold air return, ductwork, etc.) and its condition where visible. Indicate the locations on the floor plan diagram.

Ductwork is in good condition

8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

a) Is there an attached garage? (Yes) No

If yes, does it have a separate heating unit? (Yes) No

b) Are any petroleum-powered machines or vehicles stored in an attached garage (e.g., lawn mower, ATV, car) (Yes) No

c) Has the building ever had a fire? Yes (No)

d) Is there a fuel burning or unvented gas space heater? Yes (No)

e) Is there a workshop or hobby/craft area? Yes (No)

If yes, where and what type? _____

f) Is there smoking in the building? Yes (No)

If yes, how frequently? _____

INDOOR AIR BUILDING SURVEY AND SAMPLING FORM (continued)

g) Have cleaning products been used recently? (Yes) No

If yes, when and what type? General purpose

h) Have cosmetic products been used recently? Yes (No)

If yes, when and what type? _____

i) Has there been painting or staining in the last six months? Yes (No)

If yes, when and where? _____

j) Is there new carpet, drapes, or other textiles? Yes (No)

If yes, when and where? _____

k) Have air fresheners been used recently? (Yes) No

If yes, when and what type? Spray cans

l) Is there a kitchen exhaust fan? Yes (No)

If yes, where is it vented? _____

m) Is there a clothes dryer? (Yes) No

If yes, is it vented outside? (Yes) No

n) Has there been a pesticide application? (Yes) No

If yes, when and what type? Bug Spray used last Summer

o) Are there odors in the building? Yes (No)

If yes, please describe: _____

INDOOR AIR BUILDING SURVEY AND SAMPLING FORM (continued)

p) Do any of the building occupants use solvents at work (e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetology)?

Yes (No)

If yes, what types of solvents are used? NA

If yes, are their clothes washed at work? Yes (No)

q) Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response.)

(No) Unknown

Yes, use dry-cleaning regularly (weekly)

Yes, use dry-cleaning infrequently (monthly or less)

Yes, work at a dry-cleaning service

r) Is there a radon mitigation system for the building/structure? Yes (No)

If yes, what is date of installation? NA Active Passive

s) Additional mitigation system information (fan size, location, operating status, liner installed, etc.):

None

t) Is there an irrigation well, or any other well, present at the property: Yes (No)

If yes, please describe placement, use, and history below.

NA

PRODUCT INVENTORY FORM:

Make and Model of field instrument used: ppb RAE 3000

List specific products found in the residence or area that have the potential to affect indoor air quality (e.g., gasoline or kerosene storage cans, glues, paints, cleaning solvents/products, polishes/waxes, new furniture/ carpet, nail polish/hairspray/cologne).

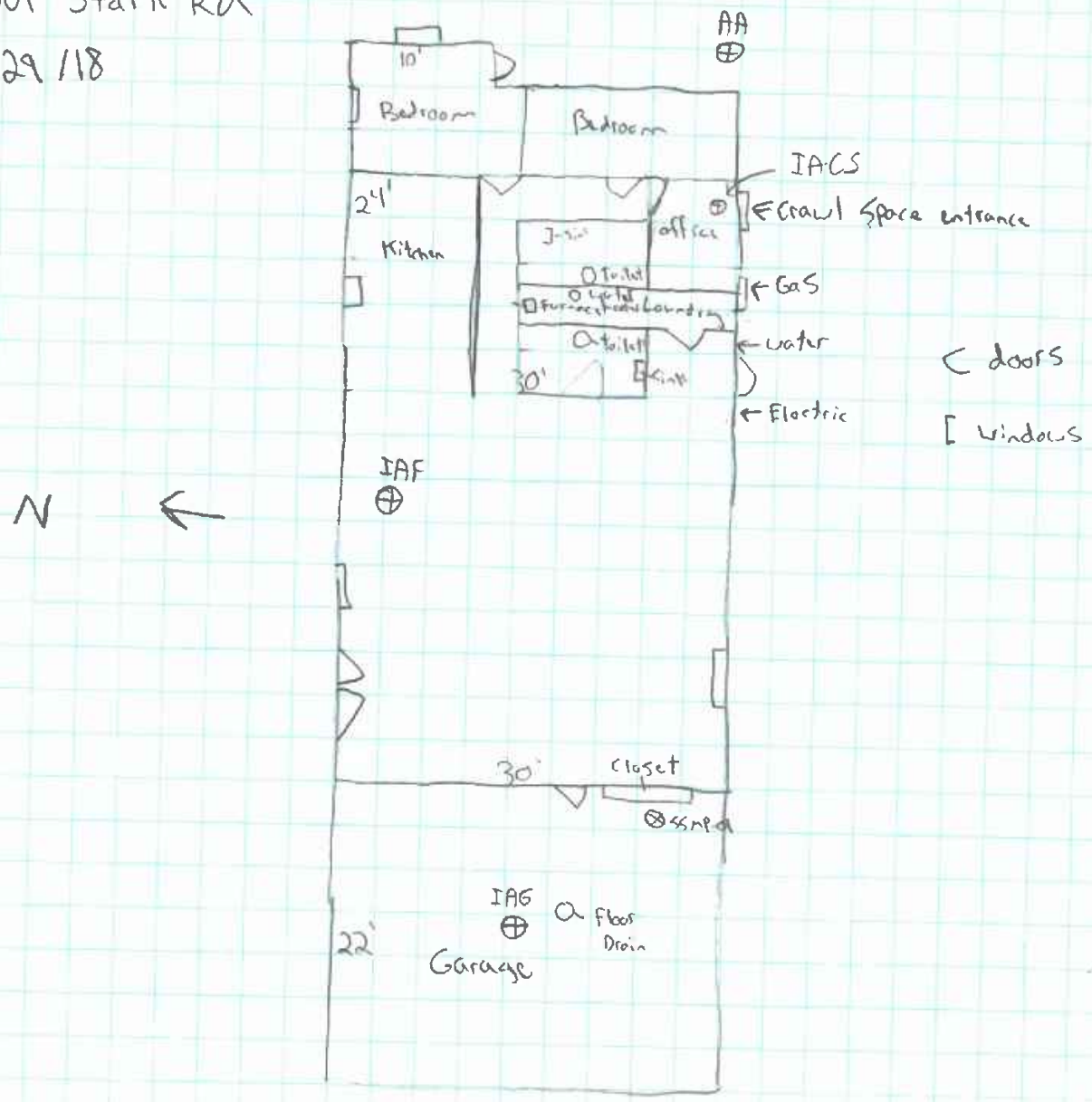
Potential Source	Location	Size and Condition	Chemical Ingredients	Field Instrument Reading (units)	Photo Y/N
Gasoline Storage Cans and Equipment	Garage				
Kerosene Storage Cans	—				
Paints/Thinners/Strippers	Garage				
Cleaning Solvents	~~Garage~~ 4L				
Hobby Supplies – Glue, Paint, Etc.	—				
Oven Cleaner	—				
Carpet/Upholstery Cleaners	Kitchen				
Household Cleaners (non-solvent)	Kitchen				
Moth Balls	Garage				
Polishes/Waxes	—				
Insecticides	Garage				
Furniture/Floor Polish	—				
Hairspray	—				
Cologne/Perfume	Bathroom				
Air Fresheners	Bathroom				
Interior Fuel Tank	—				
Wood Stove/Fireplace	Living room				
New Furniture/Upholstery	—				
New Carpeting/Flooring	—				
Others (fill in below)					
Motorcycle					
Snow blower					
Weed Wacker					
Note – Chemicals of concern moved into tote and placed Outside garage					

Product Inventory Form

I.e. gasoline cans/equipment, kerosene, paints/thinners/strippers, cleaning solvents, hobby supplies (glues), oven cleaner, carpet/upholstery cleaners, household cleaners, moth balls, polishes/waxes, insecticides, furniture/floor polish, hairspray, cologne/perfume, air fresheners, interior fuel tank, wood stove/fireplace, new furniture/upholstery, new carpet/flooring

Location	Product Description	Chemical Ingredients	Quantity	PID Reading (ppb)	Photo	Removed (Y/N)
Garage	Moth balls	VOCs		0	Y	Y
Garage	Ortho Home defense	insecticides	2 containers	0	Y	Y
Garage	Rust penetrant	VOCs	Multiple	0	Y	Y
First Floor	Glade-Solid air	VOCs	Multiple	0	Y	Y
Garage	Air freshener					
Garage	Brakleen	VOCs		0	Y	Y
First Floor	Resolve-Pet Expert	Various	1	0	Y	Y
First Floor	Scotchgard Auto fabric cleaner	Various	1	0	N	Y
Garage	Rustoleum - High Performance Enamel	VOCs	1	0	N	Y
Garage	Gunk-Engine degreaser	VOCs	1	0	N	Y
Garage	Breathless Carnauba Cleaner Wax	VOCs	1	0	N	Y
Garage	WD-40	VOCs	1	0	N	Y
Garage	Bulls Eye Shellac	VOCs	1	0	N	Y
Garage	Flex Seal	VOCs	1	0	Y	Y
First Floor	Kiwi-Lamp Dry	VOCs	1	0	N	Y
Garage	Gasoline	VOCs	5	9500	Y	Y

Donald Richmond
12001 Starr Rd
10/29/18



Real Time Exposure Monitoring Data Collection Form

Document all air monitoring conducted on the Site below. Keep this form with the project file.

Site Name: 12001 Stark Rd. Date: 10-29-18

Instrument: PID Model: ppb RAE 3000 Serial #: —

Calibration Method: (Material used settings, etc.)	Isobutylene (100 ppm)
Calibration Results:	PASS
Calibrated By:	NA

Activity Being Monitored	Compounds/Hazards Monitored	Time	Reading	Action Required? Y/N
SSMP-01	VOCs	1740	0 ppb	N

Describe Any Actions Taken as a Result of this Air Monitoring and Why (does it match Table 5-1):

_____

_____

ARCADIS

Soil Vapor Collection Log Sheet

Office Name & Address (Reporting Information) 28550 Cabot Drive Suite 500 Novi, MI 48377	Project Name: Ford Project Number: MI001454.0003.
Field Manager: Adam Richmond	Address: 12001 Stark
Phone: (248) 994-2240 / Fax:	Special Instructions:
Email Address for Result Reporting: Kristoffer.Hinskey@arcadis.com	Sampler Name, Phone Number, Email:
Helium Detector Used:	Helium Leak Test Method: Bucket/Shroud
Summa Canister Size (1L, 2.7 L, 6L): 1L	Lab: Eurofins

Sample ID	Sample Location Description	Date	Leak/Tracer Test: Shut In Test Pass/Fail?	Leak/Tracer Test: Pre-sample Purge Reading (ppm)	Leak/Tracer Test: Shroud Helium Concentration (%)	Leak/Tracer Test: Post-Sample Purge Reading (ppm)	Leak/Tracer Test: Helium Test Pass/Fail?	Purge Volume (mL)	Purge Rate (mL/min)	Canister No.	Flow Controller Number	Sample Collection Start Time	Starting Canister Pressure (in Hg)	Sample Collection End Time	Ending Canister Pressure (in Hg)	Notes
SSMP-EXAMPLE (12012017)	West side of station building behind cashier counter	12/1/17	Pass	0	60	15	Pass	120	120	2505	12345	0831	-30	0841	-5	Debris noted under steel cap and in annular space around vapor pin. Cleaned out prior to sampling.
SSMP-12001Stark-01 10/31/18	Garage	10-31-18	Pass	0	116,000	—	Pass	200	120	122423	23671	1102	-28.5	1118	-5	

Meteorological Data

Date	Time	Temp (°F) Indoor	Temp (°F) Outdoor	% Humidity	Barometric Pressure (in.)
Example - 12/1/2017	0800	73	22	38	30.10
10-31-18	1102	56	54	91	29.78

General Notes or Observations

Air Parameters (completed after sample collection)

Location ID	CO2%	O2 %
SSMP-EXAMPLE	1.6	12.5
SSMP-01	1.0	20.5

Micro Manometer 0.0007

ARCADIS

Indoor/Ambient Air Collection Log Sheet

Office Name & Address (Reporting Information)
28550 Cabot Drive Suite 500
Novi, MI 48377

Field Manager
Adam Richmond

Phone: (248) 994-2240
Fax:
Email Address for Result Reporting: Kristoffer.Hinskey@arcadis.com

Special Instructions:

Project Name: Ford
Project Number: MI001454.0003.00003
Address: 12001 Stark
Sampler Name, Phone Number, Email: M-Sump

Summa Canister Size (1L, 2.7 L, 6L): 6L
Lab: Eurofins

Sample ID	Sample Location Description	Indoor/Outdoor	PID in sampling area (ppm)	Date	Canister Number	Flow Controller Number	Sample Collection Start Time	Beginning Canister Pressure (in Hg)	Sample Collection End Time	Ending Canister Pressure (in. Hg)	Heating, Ventilation, and Air Conditioning System Information: HVAC Fan On?	Heat On?	Temperature Setting (°F) (start/end)	Flow Rate (cfm) (start/end)	Notes
IA-EXAMPLE (12012017)	West side of station building behind cashier counter	Indoor	0.01	12/1/17	1234	56789	0800	-30	1600	-5	Yes	Yes	75/73	2.6/2.8	Moderate odors in vicinity of sampling canister
AA-12001 Stark-01 _103018	SE side of house on porch	O	Ø	10/30/18	6L1796	40627	1215	-28.5	1108	-7					
IAC3-12001 Stark-01 _103018	crawl space	I	Ø		6L1743	22278	1220	-27.5	1049	-6					
IAG-12001 Stark-02 _103018	middle of garage	I	Ø		6L05585	20512	1227	-29	1106	-7.5					some chemicals still in garage, Ø readings on PID
IAF-12001 Stark-03 _103018	living room end table	I	Ø		6L1620	20090	1229	-30	1105	-8					

Meteorological Data

Date	Time	Temp. (°F) Indoor	Temp. (°F) Outdoor	% Humidity	Barometric Pressure (in.)	Air Speed (mph)
Example - 12/1/2017	0800	73	22	38	30.10	30.10
10/30/18	1215	76	52	69	30.09	~~30.10~~ 9
10/31/18	1152	~70	51	100	29.71	9

General Notes or Observations

eurafins — Analysis Request / Canister Chain of Custody

Air Toxics

For Laboratory Use Only

PID: PPBRAE 3000 Workorder # _____

180 Blue Ravine Rd. Suite B, Folsom, CA 95630

Phone (800) 985-5955; Fax (916) 351-8279

Click links below to view:
Canister Sampling Guide
Helium Shroud Vide

Client: Ford PID: PPBRAE 3000

Project Name: Ford LTP

Project Manager: Kris Hinskey P.O.# MI001454.0003

Sampler: Z. Westphal

Site Name: 12001 Stark

Special Instructions/Notes. Report ONLY 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, 1,4-Dioxane, PCE, TCE and VC Submit results through Cadena at jim.tomalia@cadena.com. Cadena #E203631. Level IV Reporting

Turnaround Time (Rush surcharges may
~~10 day~~ 5 day

Lab ID	Sample Identification	Can #	Flow Controller #	Start Sampling Information Date	Start Sampling Information Time	Stop Sampling Information Date	Stop Sampling Information Time	Canister Vacuum/Pressure Initial (in Hg)	Canister Vacuum/Pressure Final (in Hg)	Lab Use Only Receipt	Lab Use Only Final (psig) Gas: N_2 / He	Requested
1	12001 Stark-01_103018	1796	L40627	10/30/18	1215	10/31/18	1108	-28.5	-7			
2	AMB-12001 Stark-01_103018	1743	22278	10/30/18	1220	10/31/18	1049	-27.5	-6			
3	AMB-12001 Stark-02_103018	0505	20512	10/30/18	1227	10/31/18	1106	-29	-7.5			
4	AMB-12001 Stark-03_103018	L1620	22090	10/30/18	1229	10/31/18	1105	-30	-8			
5	SMP-12001 Stark-01_103118	2423	23671	10/30/18	1102	10/31/18	1118	-28.5	-5			
6												
7												
8												
9												
10							Time					
11							Time					
12							Time					
13												
14						Yes	No					
15												

Relinquished by: (Signature/Affiliation) | Date | Received by: (Signature/Affiliation) | Date | Time

TRANSMITTAL LETTER

ARCADIS Design & Consultancy for natural and built assets

To:
George Al-Husari
Shawn Collins
Brandon Alger (EGLE)
Todd Walton (Ford)
Chuck Pinter (Ford)
Rob Boley (Schiff Hardin LLP)

From:
Kris Hinskey

Arcadis of Michigan, LLC
28550 Cabot Drive
Suite 500
Novi
Michigan 48377
Tel 248 994 2240
Fax 248 994 2241

Copies:

Date:
June 19, 2019

Subject:
12001 Stark Road
Vapor Intrusion Assessment
Data Package

We are sending you hard copies:

☒ **Attached** ☐ **Under Separate Cover Via _____ the Following Items:**

☐ Shop Drawings ☐ Plans ☐ Specifications ☐ Change Order
☐ Prints ☒ Samples ☐ Copy of Letter ☐ Reports
☐ Other:

Copies	Date	Drawing No.	Rev.	Description	Action*
1	6/21/2019			Figure	
1	6/21/2019			Analytical Results	
1	6/21/2019			Field Notes and Drawings	

Action*
☐ A Approved
☐ AN Approved As Noted
☐ AS As Requested
☐ CR Correct and Resubmit
☐ F File
☐ FA For Approval
☐ Resubmit _____ Copies
☐ Return _____ Copies
☐ Review and Comment
☐ Other:

Mailing Method
☐ U.S. Postal Service 1st Class ☐ Courier/Hand Delivery ☐ FedEx Priority Overnight ☐ FedEx 2-Day Delivery
☐ Certified/Registered Mail ☐ United Parcel Service (UPS) ☐ FedEx Standard Overnight ☐ FedEx Economy
☒ Other: email

Thank you for cooperating with the air sampling at your property on April 18 and 19, 2019. Attached is your data package.

LEGEND:

- INDOOR AIR LOCATION
- AMBIENT AIR LOCATION
- SUB-SLAB MONITORING POINT LOCATION
- BUILDING
- PROPERTY BOUNDARIES

0 15 30
SCALE IN FEET

FORD MOTOR COMPANY
LIVONIA TRANSMISSION PLANT
LIVONIA, MICHIGAN

AIR SAMPLING LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 1

CITY: NOVI DIV: ENV DB: MG PIC: R. ELLIS PM: K_HINSKEY TM: T. STEVENS TR: P. CURRY PROJECT NUMBER: MI001373.0001.00003 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet
Z:\GISProjects_ENV\Novi\Brighton_MI\Ford\Livonia\GIS\docs\2018-11\12001_Stark_20181110.mxd PLOTTED: 11/12/2018 10:18:20 AM BY: mgress

eurofins | Air Toxics

4/29/2019
Mr. Jim Tomalia
Arcadis U.S., Inc.
28550 Cabot Dr.
Suite 500
Novi MI 48377

Project Name: Ford LTP Off-Site Sampling
Project #:
Workorder #: 1904509

Dear Mr. Jim Tomalia

The following report includes the data for the above referenced project for sample(s) received on 4/23/2019 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

eurofins | Air Toxics

WORK ORDER #: 1904509

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. #**	MI001454.0003.0002
FAX:		**PROJECT #**	Ford LTP Off-Site Sampling
DATE RECEIVED:	04/23/2019	**CONTACT:**	Ausha Scott
DATE COMPLETED:	04/29/2019		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	AA-12001STARK-01_041819	Modified TO-15	7.0 "Hg	5 psi
02A	IAF-12001STARK-03_041819	Modified TO-15	5.5 "Hg	5 psi
03A	IAG12001STARK-02_041819	Modified TO-15	7.0 "Hg	5 psi
04A(cancelled)	DUP-12001STARK-01_041819	Modified TO-15		
05A	DUP-12001STARK-02_041819	Modified TO-15	5.0 "Hg	5 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:  DATE: 04/29/19

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP - E8 , LA NELAP - 02089, NH NELAP - 209218, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-18-13, UT NELAP CA009332018-10, VA NELAP - 9505, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005-011, Effective date: 10/18/2018, Expiration date: 10/17/2019.
Eurofins Air Toxics LLC. certifies that the test results contained in this report meet all requirements of the NELAC standards

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# 1904509

Five 6 Liter Summa Canister (100% Cert Ambient) samples were received on April 23, 2019. 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.

Requirement	***TO-15***	***ATL Modifications***
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

Sample DUP-12001STARK-01_041819 was cancelled on 04/19/19 per client's request.

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 Off-Site Sampling

Client ID:	AA-12001STARK-01_041819		
Lab ID:	1904509-01A	**Date/Time Analyzed:**	4/25/19 11:43 AM
Date/Time Collected:	4/19/19 07:11 AM	**Dilution Factor:**	1.75
Media:	6 Liter Summa Canister (100% Cert Ambier	**Instrument/Filename:**	msd20.i / 20042506

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.17	0.62	0.69	Not Detected
1,4-Dioxane	123-91-1	0.51	0.57	0.63	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.37	0.62	0.69	Not Detected
Tetrachloroethene	127-18-4	0.74	1.1	1.2	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.39	0.62	0.69	Not Detected
Trichloroethene	79-01-6	0.46	0.85	0.94	Not Detected
Vinyl Chloride	75-01-4	0.14	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	103
4-Bromofluorobenzene	460-00-4	70-130	109
Toluene-d8	2037-26-5	70-130	127

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

Client ID:	IAF-12001STARK-03_041819		
Lab ID:	1904509-02A	**Date/Time Analyzed:**	4/25/19 01:33 PM
Date/Time Collected:	4/19/19 07:12 AM	**Dilution Factor:**	1.64
Media:	6 Liter Summa Canister (100% Cert Ambier	**Instrument/Filename:**	msd20.i / 20042507

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.16	0.58	0.65	Not Detected
1,4-Dioxane	123-91-1	0.48	0.53	0.59	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.35	0.58	0.65	Not Detected
Tetrachloroethene	127-18-4	0.69	1.0	1.1	0.70 J
trans-1,2-Dichloroethene	156-60-5	0.36	0.58	0.65	Not Detected
Trichloroethene	79-01-6	0.43	0.79	0.88	Not Detected
Vinyl Chloride	75-01-4	0.13	0.38	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	107
4-Bromofluorobenzene	460-00-4	70-130	104
Toluene-d8	2037-26-5	70-130	100

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

Client ID:	IAG12001STARK-02_041819		
Lab ID:	1904509-03A	**Date/Time Analyzed:**	4/25/19 02:12 PM
Date/Time Collected:	4/19/19 07:09 AM	**Dilution Factor:**	1.75
Media:	6 Liter Summa Canister (100% Cert Ambier	**Instrument/Filename:**	msd20.i / 20042508

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.17	0.62	0.69	Not Detected
1,4-Dioxane	123-91-1	0.51	0.57	0.63	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.37	0.62	0.69	Not Detected
Tetrachloroethene	127-18-4	0.74	1.1	1.2	1.4
trans-1,2-Dichloroethene	156-60-5	0.39	0.62	0.69	Not Detected
Trichloroethene	79-01-6	0.46	0.85	0.94	Not Detected
Vinyl Chloride	75-01-4	0.14	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	112
4-Bromofluorobenzene	460-00-4	70-130	104
Toluene-d8	2037-26-5	70-130	96

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

Client ID:	DUP-12001STARK-02_041819		
Lab ID:	1904509-05A	**Date/Time Analyzed:**	4/25/19 02:51 PM
Date/Time Collected:	4/19/19 07:11 AM	**Dilution Factor:**	1.61
Media:	6 Liter Summa Canister (100% Cert Ambier	**Instrument/Filename:**	msd20.i / 20042509

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.15	0.57	0.64	Not Detected
1,4-Dioxane	123-91-1	0.47	0.52	0.58	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.34	0.57	0.64	Not Detected
Tetrachloroethene	127-18-4	0.68	0.98	1.1	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.36	0.57	0.64	Not Detected
Trichloroethene	79-01-6	0.42	0.78	0.86	Not Detected
Vinyl Chloride	75-01-4	0.13	0.37	0.41	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	98

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

Client ID:	Lab Blank		
Lab ID:	1904509-06A	**Date/Time Analyzed:**	4/25/19 10:31 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd20.i / 20042505a

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.095	0.36	0.40	Not Detected
1,4-Dioxane	123-91-1	0.29	0.32	0.36	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.21	0.36	0.40	Not Detected
Tetrachloroethene	127-18-4	0.42	0.61	0.68	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.22	0.36	0.40	Not Detected
Trichloroethene	79-01-6	0.26	0.48	0.54	Not Detected
Vinyl Chloride	75-01-4	0.082	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	106
4-Bromofluorobenzene	460-00-4	70-130	100
Toluene-d8	2037-26-5	70-130	100

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

Client ID:	CCV		
Lab ID:	1904509-07A	**Date/Time Analyzed:**	4/25/19 07:35 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd20.i / 20042502

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	104
1,4-Dioxane	123-91-1	116
cis-1,2-Dichloroethene	156-59-2	111
Tetrachloroethene	127-18-4	105
trans-1,2-Dichloroethene	156-60-5	106
Trichloroethene	79-01-6	100
Vinyl Chloride	75-01-4	107

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	104
Toluene-d8	2037-26-5	70-130	100

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

Client ID:	LCS		
Lab ID:	1904509-08A	**Date/Time Analyzed:**	4/25/19 08:29 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd20.i / 20042503

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	106
1,4-Dioxane	123-91-1	115
cis-1,2-Dichloroethene	156-59-2	119
Tetrachloroethene	127-18-4	111
trans-1,2-Dichloroethene	156-60-5	93
Trichloroethene	79-01-6	126
Vinyl Chloride	75-01-4	108

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	102
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 Off-Site Sampling

Client ID:	LCSD		
Lab ID:	1904509-08AA	**Date/Time Analyzed:**	4/25/19 09:23 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd20.i / 20042504

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	109
1,4-Dioxane	123-91-1	120
cis-1,2-Dichloroethene	156-59-2	124
Tetrachloroethene	127-18-4	109
trans-1,2-Dichloroethene	156-60-5	96
Trichloroethene	79-01-6	122
Vinyl Chloride	75-01-4	114

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	101
Toluene-d8	2037-26-5	70-130	98

* % Recovery is calculated using unrounded analytical results.

April 29, 2019

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

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: MI001454.0002/3/4.00002/2B/3B
Client project scope reference: Sample COC only was used to define project analytical requirements.
Laboratory: Eurofins Air Toxics - Folsom
Laboratory submittal: 1904509
Sample date: 2019-04-19
Report received by CADENA: 2019-04-29
Initial Data Verification completed by CADENA: 2019-04-29

4 Air sample 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 Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

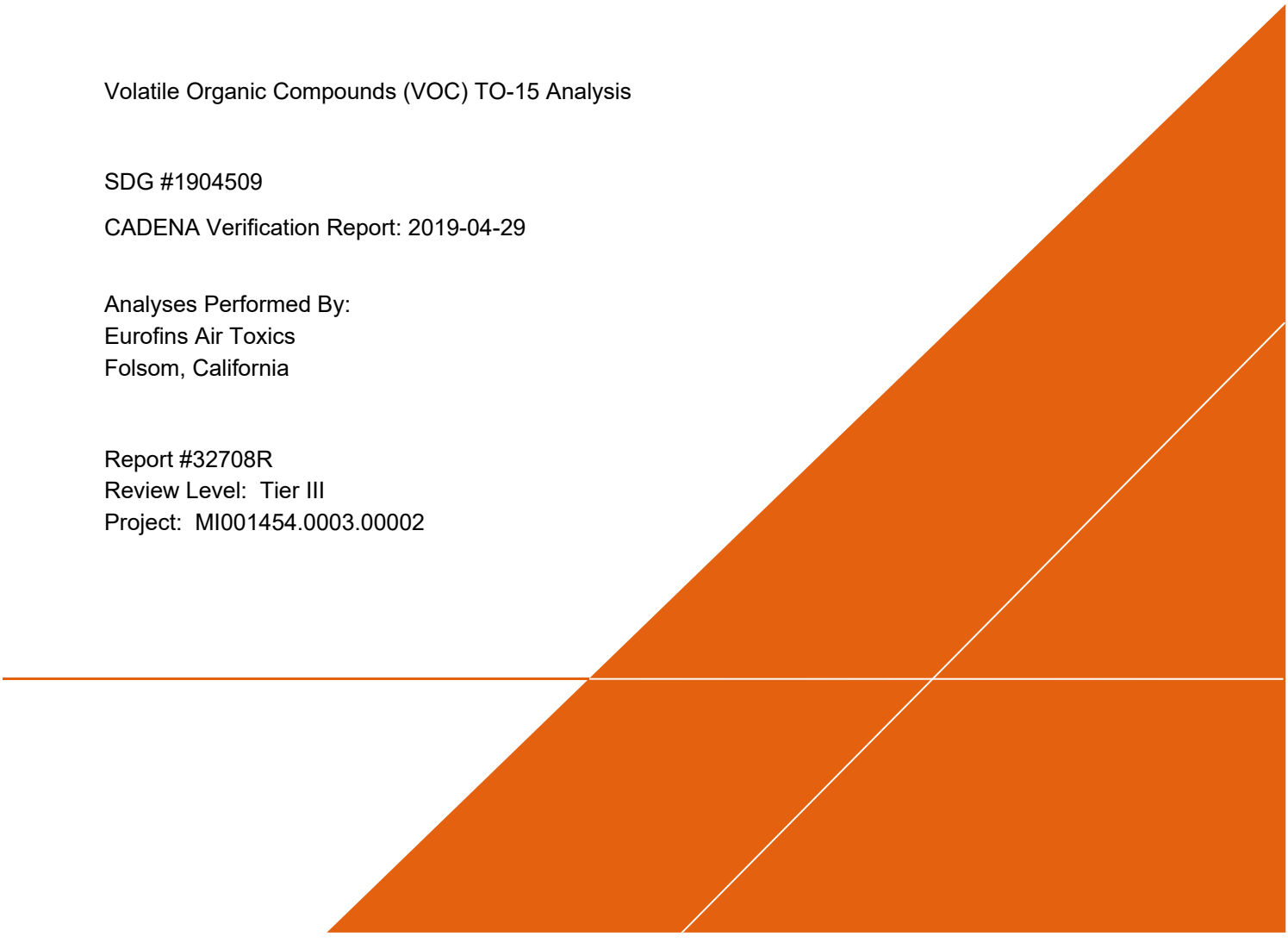
Volatile Organic Compounds (VOC) TO-15 Analysis

SDG #1904509

CADENA Verification Report: 2019-04-29

Analyses Performed By:
Eurofins Air Toxics
Folsom, California

Report #32708R
Review Level: Tier III
Project: MI001454.0003.00002



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 1904509 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

SDG	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
						TO-15 (Full Scan)	TO-15 (SIM)	MISC
1904509	AA-12001STARK-01_041819	1904509-01A	Air	4/19/2019		X		
	IAF-12001STARK-03_041819	1904509-02A	Air	4/19/2019		X		
	IAG12001STARK-02_041819	1904509-03A	Air	4/19/2019		X		
	DUP-12001STARK-02_041819	1904509-05A	Air	4/19/2019	AA-12001STARK-01_041819	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) Method TO-15 (Full Scan). 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	Return Canister Pressure
USEPA TO-15	Air	30 days from collection to analysis (Canister)	Ambient Temperature	< -2" Hg

All samples were analyzed within the specified holding time and canister return pressure / vacuum 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 (30%) 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 (30%) and RRF value greater than control limit (0.05).

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

4. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the VOC exhibit area counts that are not greater than 140% or less than 60% of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Compound Identification

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

All identified compounds met the specified criteria.

6. Field Duplicate Sample Analysis

The field duplicate analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 35% for air 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 not greater than five times the RL, a control limit of one times the RL is applied to the difference between the duplicate sample results.

Results (in µg/m^3) for the field duplicate samples are summarized in the following table.

Sample ID / Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
AA-12001STARK-01_041819/ DUP-12001STARK-02_041819	All compounds	U	U	AC

AC Acceptable

The calculated RPDs between the parent sample and field duplicate were acceptable.

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 VALIDATION CHECKLIST FOR VOCs

VOCs: TO-15 (Full Scan)	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Canister return pressure (<-2"Hg)		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Field Duplicate Sample RPD		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Joseph C. Houser

SIGNATURE: 

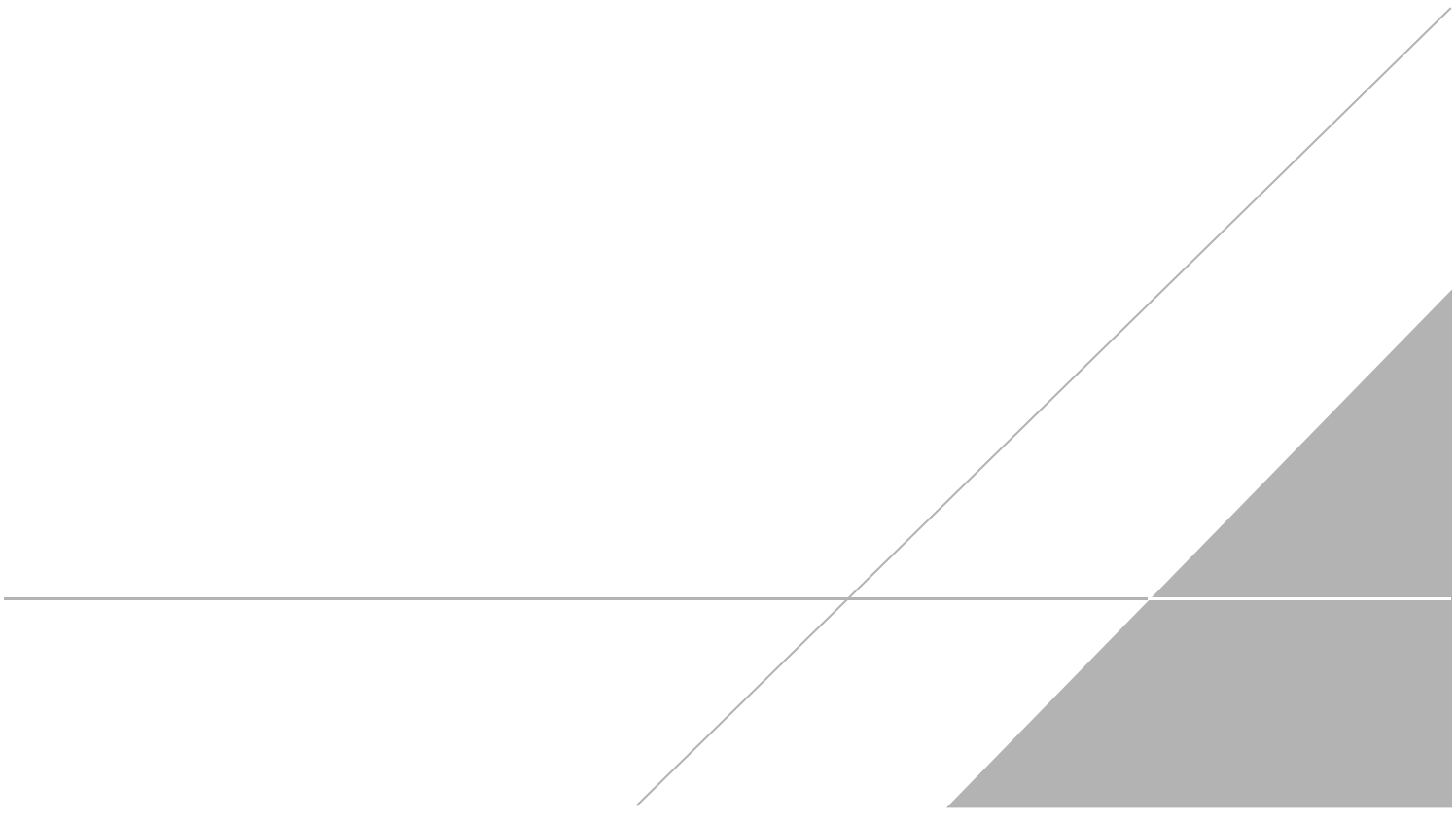
DATE: May 9, 2019

PEER REVIEW: Dennis Capria

DATE: May 10, 2019

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



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

Client ID:	AA-12001STARK-01_041819		
Lab ID:	1904509-01A	**Date/Time Analyzed:**	4/25/19 11:43 AM
Date/Time Collected:	4/19/19 07:11 AM	**Dilution Factor:**	1.75
Media:	6 Liter Summa Canister (100% Cert Ambier	**Instrument/Filename:**	msd20.i / 20042506

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.17	0.62	0.69	Not Detected
1,4-Dioxane	123-91-1	0.51	0.57	0.63	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.37	0.62	0.69	Not Detected
Tetrachloroethene	127-18-4	0.74	1.1	1.2	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.39	0.62	0.69	Not Detected
Trichloroethene	79-01-6	0.46	0.85	0.94	Not Detected
Vinyl Chloride	75-01-4	0.14	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	103
4-Bromofluorobenzene	460-00-4	70-130	109
Toluene-d8	2037-26-5	70-130	127

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

Client ID:	IAF-12001STARK-03_041819		
Lab ID:	1904509-02A	**Date/Time Analyzed:**	4/25/19 01:33 PM
Date/Time Collected:	4/19/19 07:12 AM	**Dilution Factor:**	1.64
Media:	6 Liter Summa Canister (100% Cert Ambier	**Instrument/Filename:**	msd20.i / 20042507

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.16	0.58	0.65	Not Detected
1,4-Dioxane	123-91-1	0.48	0.53	0.59	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.35	0.58	0.65	Not Detected
Tetrachloroethene	127-18-4	0.69	1.0	1.1	0.70 J
trans-1,2-Dichloroethene	156-60-5	0.36	0.58	0.65	Not Detected
Trichloroethene	79-01-6	0.43	0.79	0.88	Not Detected
Vinyl Chloride	75-01-4	0.13	0.38	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	107
4-Bromofluorobenzene	460-00-4	70-130	104
Toluene-d8	2037-26-5	70-130	100

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

Client ID:	IAG12001STARK-02_041819		
Lab ID:	1904509-03A	**Date/Time Analyzed:**	4/25/19 02:12 PM
Date/Time Collected:	4/19/19 07:09 AM	**Dilution Factor:**	1.75
Media:	6 Liter Summa Canister (100% Cert Ambier	**Instrument/Filename:**	msd20.i / 20042508

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.17	0.62	0.69	Not Detected
1,4-Dioxane	123-91-1	0.51	0.57	0.63	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.37	0.62	0.69	Not Detected
Tetrachloroethene	127-18-4	0.74	1.1	1.2	1.4
trans-1,2-Dichloroethene	156-60-5	0.39	0.62	0.69	Not Detected
Trichloroethene	79-01-6	0.46	0.85	0.94	Not Detected
Vinyl Chloride	75-01-4	0.14	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	112
4-Bromofluorobenzene	460-00-4	70-130	104
Toluene-d8	2037-26-5	70-130	96

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

Client ID:	DUP-12001STARK-02_041819		
Lab ID:	1904509-05A	**Date/Time Analyzed:**	4/25/19 02:51 PM
Date/Time Collected:	4/19/19 07:11 AM	**Dilution Factor:**	1.61
Media:	6 Liter Summa Canister (100% Cert Ambier	**Instrument/Filename:**	msd20.i / 20042509

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.15	0.57	0.64	Not Detected
1,4-Dioxane	123-91-1	0.47	0.52	0.58	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.34	0.57	0.64	Not Detected
Tetrachloroethene	127-18-4	0.68	0.98	1.1	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.36	0.57	0.64	Not Detected
Trichloroethene	79-01-6	0.42	0.78	0.86	Not Detected
Vinyl Chloride	75-01-4	0.13	0.37	0.41	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	98

Analysis Request /Canister Chain of Custody

For Laboratory Use Only

Analysis Request /Canister Chain of Custody

For Laboratory Use Only

PID: _____ Workerorder#: 1904509

180 Blue Ravine Rd. Suite B, Folsom, CA 95630

Phone (800) 985-5955; Fax (916) 351-8279

Client:	Arcadis	PID:	
Project Name:	Ford LTP Off-Site Sampling		
Project Manager:	Kris Hinskey	P.O.#	MI001454.0003.00002
Sampler:	Hayden L		
Site Name:	12001 STARK		

Special Instructions/Notes:
Report ONLY: 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, 1,4-Dioxane, PCE, TCE and VC. Submit results through Cadena at jim.tomalia@cadena.com. Cadena #E203631. Level IV Reporting

Turnaround Time (Rush surcharges may apply)

5 Day Turnaround Time

Lab ID	Sample Identification	Canister #	Flow Controller #	Start Sampling Information		Stop Sampling		Canister Vacuum/Pressure		Lab Use Only		Requested Analyses	
				Date	Time	Date	Time	Intial (in Hg)	Final (in Hg)	Receipt	Final (psig) Gas: N2 / He	TO-15 (See Special Instructions/Notes)	
01A	AA-12001STARK-01_041819	6L2377	21393	04/18/2019	08:19	04/19/2019	07:11	-29	-7			X	
02A	IAF-12001STARK-03_041819	6L2368	22148	04/18/2019	08:25	04/19/2019	07:12	-29	-5			X	
03A	IAG12001STARK-02_041819	6L2380	21011	04/18/2019	08:14	04/19/2019	07:09	-29	-7			X	
04A	DUP-12001STARK-01_041819	6L2406	20750	04/18/2019	08:14	04/19/2019	07:09	-29	-29			Failed can	
05A	DUP-12001STARK-02_041819	6L2401	22083	04/18/2019	08:19	04/19/2019	07:11	-29	-5.5			X	

Relinquished by: (Signature/Affiliation)		Date 4-19-19	Time 1600	Received by: (Signature/Affiliation)	Date 04/23/19 Time 0950
Relinquished by: (Signature/Affiliation)		Date	Time	Received by: (Signature/Affiliation)	Date Time
Relinquished by: (Signature/Affiliation)		Date	Time	Received by: (Signature/Affiliation)	Date Time

Lab Use Only

Sample Transportation Notice: Relinquishing signature on this document indicates that samples are shipped in compliance with all applicable local, State, Federal, and international laws, regulations, and ordinances of any kind. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Eurofins Air Toxics against any claim, demand, or action, of any kind, related to the collection, handling, of shipping of samples. D.O.T Hotline (800) 467-4922

Custody Seal Intact?

(Y) N None Temp NA

Fedex

eurofins | Air Toxics

4/29/2019
Mr. Jim Tomalia
Arcadis U.S., Inc.
28550 Cabot Dr.
Suite 500
Novi MI 48377

Project Name: Ford LTP Off-Site Sampling
Project #:
Workorder #: 1904515

Dear Mr. Jim Tomalia

The following report includes the data for the above referenced project for sample(s) received on 4/23/2019 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

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WORK ORDER #: 1904515

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. #**	MI001454.0003.00002
FAX:		**PROJECT #**	Ford LTP Off-Site Sampling
DATE RECEIVED:	04/23/2019	**CONTACT:**	Ausha Scott
DATE COMPLETED:	04/29/2019		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	SSMP-12001STARK-01_041919	TO-15	5.3 "Hg	15.9 psi
02A	Lab Blank	TO-15	NA	NA
03A	CCV	TO-15	NA	NA
04A	LCS	TO-15	NA	NA
04AA	LCSD	TO-15	NA	NA

CERTIFIED BY:  DATE: 04/29/19

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP - E8 , LA NELAP - 02089, NH NELAP - 209218, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-18-13, UT NELAP CA009332018-10, VA NELAP - 9505, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005-011, Effective date: 10/18/2018, Expiration date: 10/17/2019.
Eurofins Air Toxics LLC. certifies that the test results contained in this report meet all requirements of the NELAC standards

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

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LABORATORY NARRATIVE
EPA Method TO-15
Arcadis U.S., Inc.
Workorder# 1904515

One 1 Liter Summa Canister (100% Certified) sample was received on April 23, 2019. 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 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 Off-Site Sampling

Client ID:	SSMP-12001STARK-01_041919		
Lab ID:	1904515-01A	**Date/Time Analyzed:**	4/27/19 09:45 PM
Date/Time Collected:	4/19/19 07:41 AM	**Dilution Factor:**	2.53
Media:	1 Liter Summa Canister (100% Certified)	**Instrument/Filename:**	msdj.i / j042716

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	1.5	4.0	5.0	Not Detected
1,4-Dioxane	123-91-1	4.0	14	18	Not Detected
cis-1,2-Dichloroethene	156-59-2	2.3	4.0	5.0	Not Detected
Tetrachloroethene	127-18-4	2.3	6.9	8.6	2800
trans-1,2-Dichloroethene	156-60-5	2.9	4.0	5.0	Not Detected
Trichloroethene	79-01-6	2.5	5.4	6.8	Not Detected
Vinyl Chloride	75-01-4	2.3	2.6	3.2	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	102

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

Client ID:	Lab Blank		
Lab ID:	1904515-02A	**Date/Time Analyzed:**	4/27/19 12:45 PM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msdj.i / j042705d

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.59	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	0.90	1.6	2.0	Not Detected
Tetrachloroethene	127-18-4	0.91	2.7	3.4	Not Detected
trans-1,2-Dichloroethene	156-60-5	1.1	1.6	2.0	Not Detected
Trichloroethene	79-01-6	1.0	2.1	2.7	Not Detected
Vinyl Chloride	75-01-4	0.91	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	90
Toluene-d8	2037-26-5	70-130	100

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

Client ID:	CCV		
Lab ID:	1904515-03A	**Date/Time Analyzed:**	4/27/19 10:39 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msdj.i / j042702

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	98
1,4-Dioxane	123-91-1	95
cis-1,2-Dichloroethene	156-59-2	101
Tetrachloroethene	127-18-4	99
trans-1,2-Dichloroethene	156-60-5	104
Trichloroethene	79-01-6	96
Vinyl Chloride	75-01-4	94

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	104
Toluene-d8	2037-26-5	70-130	100

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

Client ID:	LCS		
Lab ID:	1904515-04A	**Date/Time Analyzed:**	4/27/19 11:16 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msdj.i / j042703

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	100
1,4-Dioxane	123-91-1	112
cis-1,2-Dichloroethene	156-59-2	110
Tetrachloroethene	127-18-4	105
trans-1,2-Dichloroethene	156-60-5	88
Trichloroethene	79-01-6	102
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	96
4-Bromofluorobenzene	460-00-4	70-130	105
Toluene-d8	2037-26-5	70-130	102

* % Recovery is calculated using unrounded analytical results.

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

Client ID:	LCSD		
Lab ID:	1904515-04AA	**Date/Time Analyzed:**	4/27/19 11:44 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msdj.i / j042704

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	100
1,4-Dioxane	123-91-1	108
cis-1,2-Dichloroethene	156-59-2	115
Tetrachloroethene	127-18-4	105
trans-1,2-Dichloroethene	156-60-5	90
Trichloroethene	79-01-6	100
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	95
4-Bromofluorobenzene	460-00-4	70-130	106
Toluene-d8	2037-26-5	70-130	100

* % Recovery is calculated using unrounded analytical results.

April 30, 2019

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

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: MI001454.0002/3/4.00002/2B/3B
Client project scope reference: Sample COC only was used to define project analytical requirements.
Laboratory: Eurofins Air Toxics - Folsom
Laboratory submittal: 1904515
Sample date: 2019-04-19
Report received by CADENA: 2019-04-29
Initial Data Verification completed by CADENA: 2019-04-30

1 Air sample was 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 Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

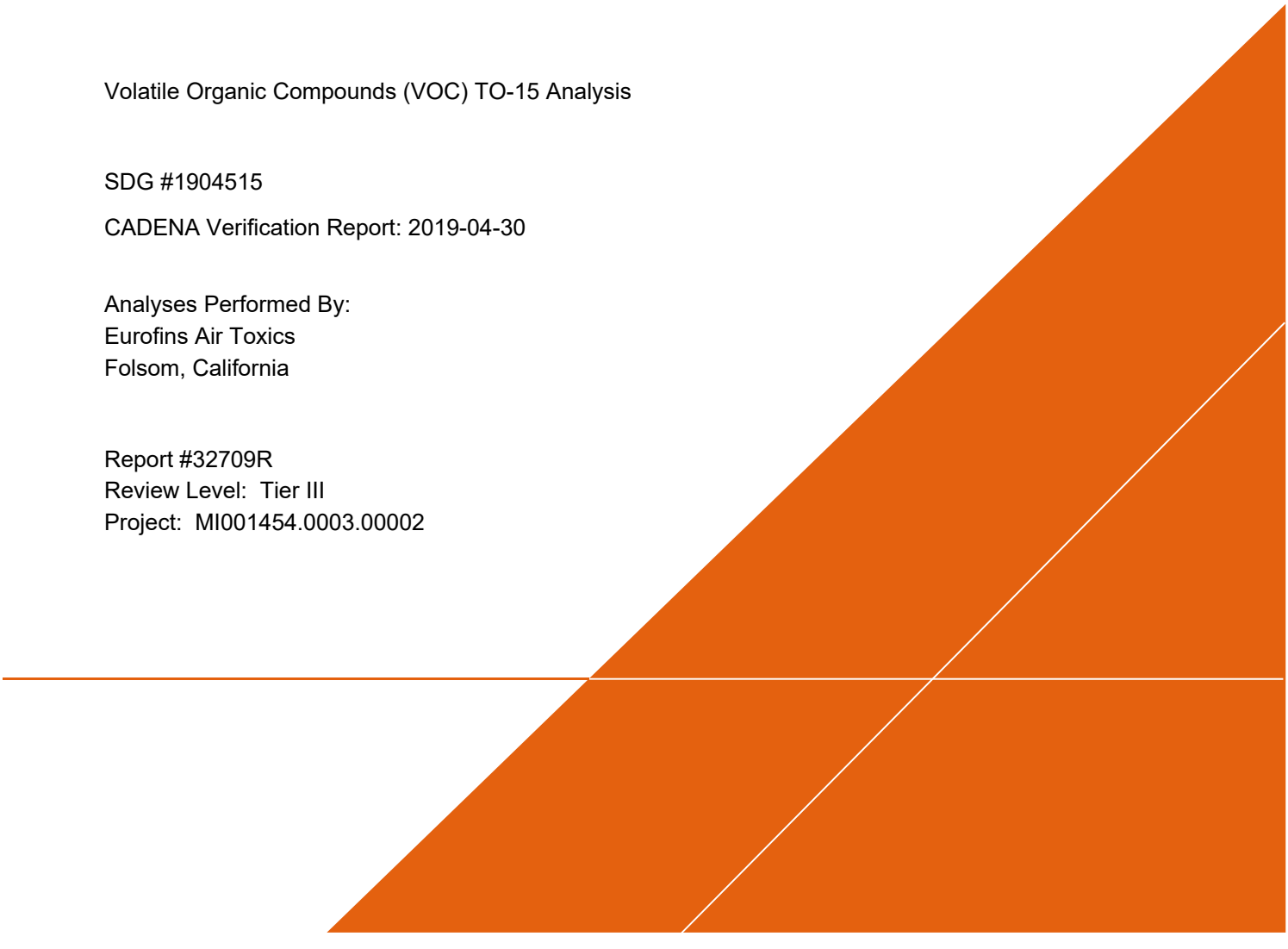
Volatile Organic Compounds (VOC) TO-15 Analysis

SDG #1904515

CADENA Verification Report: 2019-04-30

Analyses Performed By:
Eurofins Air Toxics
Folsom, California

Report #32709R
Review Level: Tier III
Project: MI001454.0003.00002



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 1904515 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

SDG	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
						TO-15 (Full Scan)	TO-15 (SIM)	MISC
1904515	SSMP-12001STARK-01_041919	1904515-01A	Air	4/19/2019		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) Method TO-15 (Full Scan). 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	Return Canister Pressure
USEPA TO-15	Air	30 days from collection to analysis (Canister)	Ambient Temperature	< -2" Hg

All samples were analyzed within the specified holding time and canister return pressure / vacuum 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 (30%) 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 (30%) and RRF value greater than control limit (0.05).

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

4. Internal Standard Performance

Internal standard performance criteria insure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria requires the internal standard compounds associated with the VOC exhibit area counts that are not greater than 140% or less than 60% of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Compound Identification

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

All identified compounds met the specified criteria.

6. Field Duplicate Sample Analysis

The field duplicate analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 35% for air 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 not greater than five times the RL, a control limit of one times the RL is applied to the difference between the duplicate sample results.

A field duplicate was not performed on a sample location within this SDG.

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 VALIDATION CHECKLIST FOR VOCs

VOCs: TO-15 (Full Scan)	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Canister return pressure (<-2"Hg)		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Field Duplicate Sample RPD					X
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Joseph C. Houser

SIGNATURE: 

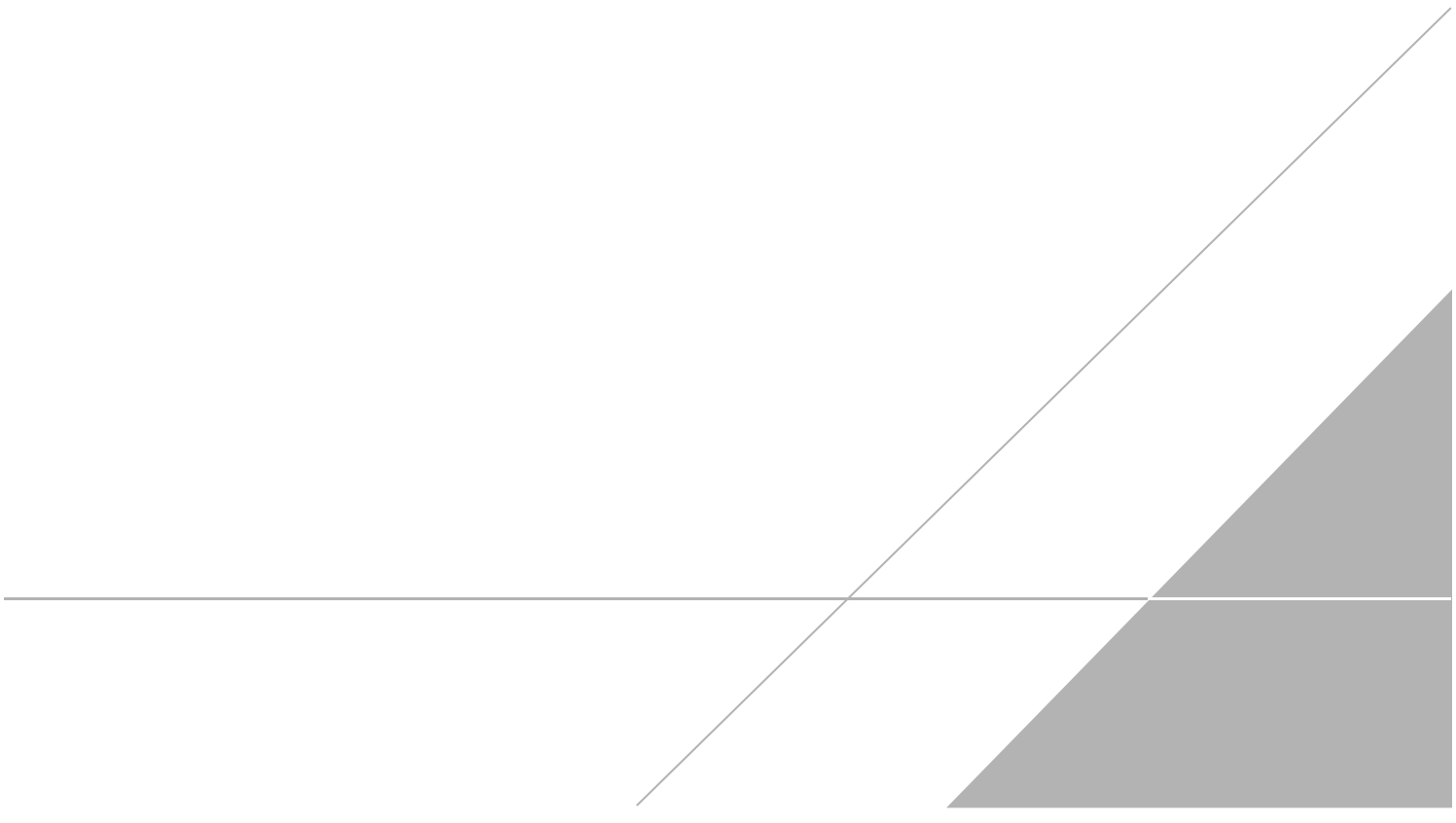
DATE: May 9, 2019

PEER REVIEW: Dennis Capria

DATE: May 10, 2019

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



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

Client ID:	SSMP-12001STARK-01_041919		
Lab ID:	1904515-01A	**Date/Time Analyzed:**	4/27/19 09:45 PM
Date/Time Collected:	4/19/19 07:41 AM	**Dilution Factor:**	2.53
Media:	1 Liter Summa Canister (100% Certified)	**Instrument/Filename:**	msdj.i / j042716

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	1.5	4.0	5.0	Not Detected
1,4-Dioxane	123-91-1	4.0	14	18	Not Detected
cis-1,2-Dichloroethene	156-59-2	2.3	4.0	5.0	Not Detected
Tetrachloroethene	127-18-4	2.3	6.9	8.6	2800
trans-1,2-Dichloroethene	156-60-5	2.9	4.0	5.0	Not Detected
Trichloroethene	79-01-6	2.5	5.4	6.8	Not Detected
Vinyl Chloride	75-01-4	2.3	2.6	3.2	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	102

Analysis Request /Canister Chain of Custody

For Laboratory Use Only

Workorder # : 1904515

PID:

Page 1 of 1

180 Blue Ravine Rd. Suite B, Folsom, CA 95630

Phone (800) 985-5955; Fax (916) 351-8279

Client: Arcadis PID:

Project Name: Ford LTP Off-Site Sampling

Project Manager: Kris Hinskey P.O# MI001454.0003.00002

Sampler: Hayden L

Site Name: 12001 STARK

Special Instructions/Notes: Report ONLY: 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, 1,4-Dioxane, PCE, TCE and VC. Submit results through Cadena at jim.tomalia@cadena.com. Cadena #E203631. Level IV Reporting

Turnaround Time (Rush surcharges may apply)

5 Day Turnaround Time

Lab ID	Sample Identification	Canister #	Flow Controller #	Start Sampling Information		Stop Sampling Information		Canister Vacuum/Pressure		Lab Use Only		Requested Analyses
				Date	Time	Date	Time	Initial (in Hg)	Final (in Hg)	Receipt	Final (psig) Gas: N2 / He	TO-15 (See Special Instructions/Notes)
01A	SSMP-12001STARK-01_041919	1L2471	23820	04/19/2019	07:28	04/19/2019	07:41	-29	-5.5			x

Relinquished by: (Signature/Affiliation) Arcadis Date 4-19-19 Time 1600 Relinquished by: (Signature/Affiliation) Date 04/23/19 Time 0950

Relinquished by: (Signature/Affiliation) Date Time Relinquished by: (Signature/Affiliation) Date Time

Relinquished by: (Signature/Affiliation) Date Time Relinquished by: (Signature/Affiliation) Date Time

Lab Use Only

Shipper Name: Custody Seals Intact? Yes No None

Sample Transportation Notice: Relinquishing signature on this document indicates that samples are shipped in compliance with all applicable local, State, Federal, and international laws, regulations, and ordinances of any kind. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Eurofins Air Toxics against any claim, demand, or action, of any kind, related to the collection, handling, of shipping of samples. D.O.T Hotline (800) 467-4922

Custody Seal Intact?

(Y) N None Temp NA

Fedex

ARCADIS Design & Consultancy for natural and built assets

Daily Log - Ford Off Site VI Investigation - VISIT 1

Project No.: MI001454.0003 Page 1 of 1

Site Location: 12001 Stark Livonia, MI

Prepared By: E Redner

Date	Time	Description of Activities
4/17/19		Purpose: R2, VI: Bldg survey, chemical inventory
		Arcadis: E. Redner, M. Olender
		Weather: 47° F, cloudy
	0800	Arcadis on site
	0805	Conduct building survey and chemical survey
↓	0825	Arcadis off site
		Note: Resident was actively smoking in garage

Visit 1 Checklist

Background sources of VOCs have been removed/isolated? (Yes) No

Location of background sources of VOCs that have been removed/isolated: (2) bins outside garage

Sump pit is present? Yes (No)

ARCADIS Design & Consultancy for natural and built assets

Daily Log - Ford Off Site VI Investigation - VISIT 2 & 3

Project No.: MI001454.0003 Page 1 of 1

Site Location: 12001 Stark Livonia, MI

Prepared By: M. Olender

Date	Time	Description of Activities
4/18/19		Purpose: RI VISIT 2 - deploy cans
↓		Arcadis: M. Olender, H. Ladd
↓		Weather: Rainy - mid 40s
↓		SUMMA Canisters used: 5 - 24 hr cans
4/18/19	0800	Arcadis onsite
↓	0814	AA/IA cans deployed, Ask Resident to keep doors/windows shut.
↓	0830	Arcadis offsite.
4-19-19	0700	Arcadis on Site
↓	0709	Retrieve 24-hour canisters
↓	0728	Conduct SSMP sampling
↓	0750	Arcadis off Site
		HML

Visit 2 & 3 Checklist:

Background sources of VOCs have been removed/isolated? (Yes) No

Number of SSMP samples collected: 1

Number of indoor/ambient air samples collected: 3 + 2 DUPs

Occupancy hours (for commercial properties only): —

Indoor Air Sampling Procedure Via USEPA Method TO-15

INDOOR AIR BUILDING SURVEY AND SAMPLING FORM

Date: 10-29-18 4-17-19 Survey Performed by: Hayden Ladd ~~Ellen R~~ Madison Olender ER

1. **OCCUPANT:**

Rent: ____ Own: X

Resident Name: George Husari

Address: 12001 Stark Rd.

Telephone: Home: 734 968 7934 Work: ____

Cell: ↗

How long have you lived at this location? Since August 2011

List current occupants/occupation below (attach additional pages if necessary):

Age (If under 18)	Sex (M/F)	Occupation
None ↓		

2. **OWNER OR LANDLORD:** (If same as occupant, check here √ and go to Item No. 3).

Last Name: ____ First Name: ____

Address: ____

City and State: ____

County: ____

Home Phone: ____ Office Phone: ____

INDOOR AIR BUILDING SURVEY AND SAMPLING FORM (continued)

3. SENSITIVE POPULATION:

Daycare/Nursing Home/Hospital/School/Other (specify): None

4. BUILDING CHARACTERISTICS:

Residential/Multi-family Residential/Office/Strip Mall/Commercial/Industrial/School

Describe Building: Residential Year Constructed: _____

Number of floors at or above grade: 1

Number of floors below grade: 0 (full basement/crawl space/slab on grade)

Depth of structure below grade: 0 ft. Basement size: 0 ft²

If the property is residential, what type? (Circle all appropriate responses.)

Ranch	2-Family	3-Family	Raised Ranch
~~Split Level~~	Colonial	Cape Cod	Contemporary
Mobile Home	Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other: _____	

If multiple units, how many? _____

If the property is commercial:

Business type(s) NA

Does it include residences (i.e., multi-use)? Yes No If yes, how many? _____

5. OCCUPANCY:

Is basement/lowest level occupied? (Circle one)

Full-time Occasionally Seldom Almost Never

INDOOR AIR BUILDING SURVEY AND SAMPLING FORM (continued)

Level	General Use (e.g., family room, bedroom, laundry, workshop, storage)
Basement	NA
1st Floor	General use
2nd Floor	
3rd Floor	
4th Floor	

(Use additional page(s) as necessary)

6. CONSTRUCTION CHARACTERISTICS: (Circle all that apply.)

a. Above Grade Construction: (Describe type: wood frame, concrete, stone, brick).

b. Basement Type: Full (Crawlspace) Slab Other: _____

c. Basement Floor: Concrete Dirt Stone Other: Sand

d. Finished Basement Floor: Uncovered Covered NA

If covered, what with? NA

e. Foundation Walls: Poured (Block) Stone Other: _____

f. Foundation Walls: (Unsealed) Sealed Sealed with: _____

g. The Basement is: Wet Damp Dry NA

h. The Basement is: Finished Unfinished Partially Finished NA

i. Sump Present (Y / (N)) If yes, how many? NA

Where Discharged? NA

Water in Sump? Yes No (Not Applicable)

INDOOR AIR BUILDING SURVEY AND SAMPLING FORM (continued)

Identify all potential soil vapor entry points and estimated size (e.g., cracks, utility parts, drains).

Drains in garage area. Some cracks

Are the basement walls or floor sealed with waterproof paint or epoxy coatings? Yes (No)

Type of ground cover outside of building: (Grass) (Concrete) Asphalt Other _____

Is an existing subsurface depressurization (radon) system in place? Yes (No)

If yes, is it active, or passive?

Is a sub-slab vapor/moisture barrier in place? Yes (No)

Type of barrier: NA

7. HEATING, VENTING, and AIR CONDITIONING

Type of heating system(s) used in this building: (Circle all that apply: Note the primary).

(Hot Air Circulation)	Heat Pump	Hot Water Baseboard
Space Heaters	Steam Radiation	Radiant Floor
Electric Baseboard	Wood Stove	Outdoor Wood Boiler
Other: _____		

The primary type of fuel used is:

(Natural Gas)	Fuel Oil	Kerosene
~~Electric~~	Propane	Solar
Wood	Coal	

Domestic hot water tank fueled by: Natural gas

Location of Boiler/Furnace: Basement Outdoors (Main Floor) Other _____

INDOOR AIR BUILDING SURVEY AND SAMPLING FORM (continued)

Air Conditioning: (Central Air) Window Units Open Windows None

Are air distribution ducts present? (Yes) No

Is there a whole house fan? (Yes) No

Describe the air intake system (outside air supply, cold air return, ductwork, etc.) and its condition where visible. Indicate the locations on the floor plan diagram.

Ductwork is in good condition

8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

a) Is there an attached garage? (Yes) No

If yes, does it have a separate heating unit? (Yes) No

b) Are any petroleum-powered machines or vehicles stored in an attached garage (e.g., lawn mower, ATV, car) (Yes) No

c) Has the building ever had a fire? Yes (No)

d) Is there a fuel burning or unvented gas space heater? Yes (No)

e) Is there a workshop or hobby/craft area? Yes (No)

If yes, where and what type? _____

f) Is there smoking in the building? Yes (No)

If yes, how frequently? _____

INDOOR AIR BUILDING SURVEY AND SAMPLING FORM (continued)

g) Have cleaning products been used recently? (Yes) No

If yes, when and what type? General purpose

h) Have cosmetic products been used recently? Yes (No)

If yes, when and what type? _____

i) Has there been painting or staining in the last six months? Yes (No)

If yes, when and where? _____

j) Is there new carpet, drapes, or other textiles? Yes (No)

If yes, when and where? _____

k) Have air fresheners been used recently? (Yes) No

If yes, when and what type? Spray gels

l) Is there a kitchen exhaust fan? Yes (No)

If yes, where is it vented? _____

m) Is there a clothes dryer? (Yes) No

If yes, is it vented outside? (Yes) No

n) Has there been a pesticide application? (Yes) No

If yes, when and what type? Bug Spray used last Summer

o) Are there odors in the building? Yes (No)

If yes, please describe: _____

INDOOR AIR BUILDING SURVEY AND SAMPLING FORM (continued)

p) Do any of the building occupants use solvents at work (e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetology)?

Yes (No)

If yes, what types of solvents are used? NA

If yes, are their clothes washed at work? Yes (No)

q) Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response.)

(No) Unknown

Yes, use dry-cleaning regularly (weekly)

Yes, use dry-cleaning infrequently (monthly or less) → every 2 weeks

Yes, work at a dry-cleaning service

r) Is there a radon mitigation system for the building/structure? Yes (No)

If yes, what is date of installation? NA Active Passive

s) Additional mitigation system information (fan size, location, operating status, liner installed, etc.):

None

t) Is there an irrigation well, or any other well, present at the property: Yes (No)

If yes, please describe placement, use, and history below.

NA

PRODUCT INVENTORY FORM:

Make and Model of field instrument used: ppb RAE 3000

List specific products found in the residence or area that have the potential to affect indoor air quality (e.g., gasoline or kerosene storage cans, glues, paints, cleaning solvents/products, polishes/waxes, new furniture/ carpet, nail polish/hairspray/cologne).

Potential Source	Location	Size and Condition	Chemical Ingredients	Field Instrument Reading (units)	Photo Y/N
Gasoline Storage Cans and Equipment	Garage				
Kerosene Storage Cans	—				
Paints/Thinners/Strippers	Garage				
Cleaning Solvents	~~Garage~~ HC				
Hobby Supplies – Glue, Paint, Etc.	—				
Oven Cleaner	—				
Carpet/Upholstery Cleaners	Kitchen				
Household Cleaners (non-solvent)	Kitchen				
Moth Balls	Garage				
Polishes/Waxes	—				
Insecticides	Garage				
Furniture/Floor Polish	—				
Hairspray	—				
Cologne/Perfume	Bathroom				
Air Fresheners	Bathroom				
Interior Fuel Tank	—				
Wood Stove/Fireplace	Living room				
New Furniture/Upholstery	—				
New Carpeting/Flooring	—				
Others (fill in below)					
Motorcycle					
Snow blower					
Weed Whacker					
Note – Chemicals of concern moved into tote and placed Outside garage					

Product Inventory Form

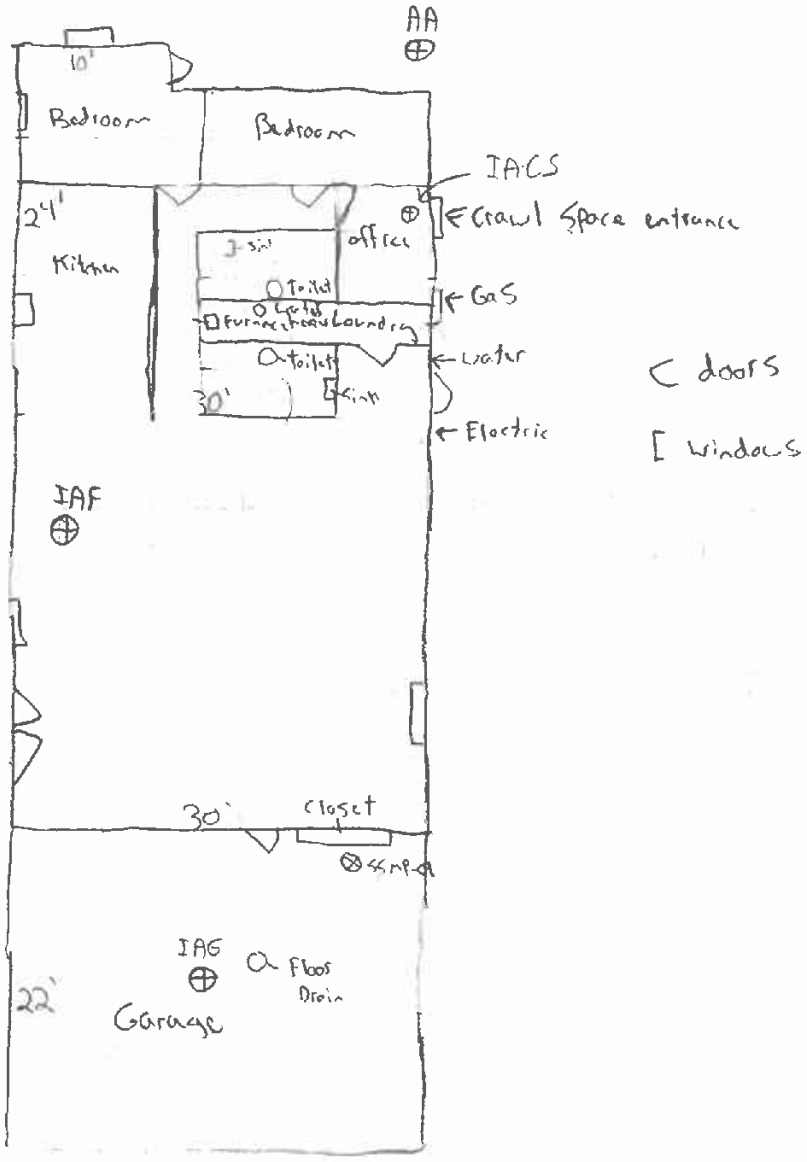
I.e. gasoline cans/equipment, kerosene, paints/thinners/strippers, cleaning solvents, hobby supplies (glues), oven cleaner, carpet/upholstery cleaners, household cleaners, moth balls, polishes/waxes, insecticides, furniture/floor polish, hairspray, cologne/perfume, air fresheners, interior fuel tank, wood stove/fireplace, new furniture/upholstery, new carpet/flooring

Location	Product Description	Chemical Ingredients	Quantity	PID Reading (ppb)	Photo	Removed (Y/N)
Garage	Moth balls	VOCs		0	Y	Y
Garage	Ortho Home defense	insecticides	2 cans	0	Y	Y
Garage	Rust preventative	VOCs	Multiple	0	Y	Y
First Floor	Glade-Solid air	VOCs	Multiple	0	Y	Y the Y
~~Garage~~ HL	freshener					
Garage	Brakleen	VOCs		0	Y	Y
First Floor	Resolve-Pet Expert	Various	1	0	Y	Y
First Floor	Scotch-guard Auto foaming cleaner	Various	1	0	N	Y
Garage	Rustoleum - High Performance Enamel	VOCs	1	0	N	Y
Garage	Gunk-Engine degreaser	VOCs	1	0	N	Y
Garage	Breakling/carnauba Cleaner Wax	VOCs	1	0	N	Y
Garage	WD-40	VOCs	1	0	N	Y
Garage	Bulls Eye Shellac	VOCs	1	0	N	Y
Garage	Flex Seal	VOCs	1	0	Y	Y
First Floor	Kiwi-Temp Dry	VOCs	1	0	N	Y
Garage	Gasoline	VOCs	3	9500	Y	Y
Garage	scrubbing bubbles		2	0	Y	Y
	Homework carpet cleaner		1			
	Caulk		4			
	Gutter sealer		1			
	Off backyard pre-treat		1			
	Round up		1			
	Brake fluid		1			
	Power steering fluid		1			

still in same tote

0 ppb

Donald Richmond
12001 Starr Rd
10/29/18



N ←

R2 AA-01
Dup

- SB and IACs only collected during RI sampling.

Indoor/Ambient Air Collection

Office Name & Address (Reporting Information): Arcadis of Michigan, LLC, 28550 Cabot Drive, Suite 500, Novi, MI 48377			Project Name: Ford LTP Off-Site Sampling
Field Manager: Adam Richmond			Project Number: MI001454.0003.00002
Phone: 248-994-2240	Fax:	Special Instructions: Report ONLY: 1,1-DCE, cis-1,2- DCE, trans-1,2-DCE, 1,4-Dioxane, PCE, TCE and VC. Submit results through Cadena at jim.tomalia@cadena.com. Cadena #E203631. Level IV Reporting.	Site Address: 12001 STARK
Email Address for Result Reporting: Kristoffer.Hinskey@arcadis.com			Sampler Name: Hayden Ladd Sampler Email Address: Hayden.Ladd@arcadis.com
Summa Canister Size (1L, 2.7 L, 6L): 6 L		Lab: Eurofins	

Sample ID	Sample Location Description	Indoor/Outdoor	PID in sampling area (ppb)	Canister Number	Flow Controller Number	Sample Collection Start Date	Sample Collection Start Time	Beginning Canister Pressure (in. Hg)	Sample Collection End Date	Sample Collection End Time	Ending Canister Pressure (in. Hg)	HVAC System Information				Notes
												HVAC Fan On?	Heat On?	Start Temperature Setting (°F)	End Temperature Setting (°F)	
AA-12001STARK-01_041819	SW backyard	Outdoor	0	6L2377	21393	04/18/2019	08:19	-29	04/19/2019	07:11	-7	Yes	Yes	68	68	
IAF-12001STARK-03_041819	Family room table	Indoor	0	6L2368	22148	04/18/2019	08:25	-29	04/19/2019	07:12	-5	Yes	Yes	68	68	
IAG-12001STARK-02_041819	Garage	Indoor	0	6L2380	21011	04/18/2019	08:14	-29	04/19/2019	07:09	-7	Yes	Yes	68	68	
DUP-12001STARK-01_041819	Garage	Indoor	0	6L2406	20750	04/18/2019	08:14	-29	04/19/2019	07:09	-29	Yes	Yes	68	68	
DUP-12001STARK-02_041819	SW backyard	Outdoor	0	6L2401	22083	04/18/2019	08:19	-29	04/19/2019	07:11	-5.5	Yes	Yes	68	68	

Meteorological Data

General Notes or Observations

Date	Time	Temp. (°F)		Relative Humidity (%)	Barometric Pressure (in. Hg)	Air Speed (mph)	Source of Weather Information
		Indoor	Outdoor				
04/18/2019	08:11	68	59	79	29.62	SSW 11	weather.com app
04/19/2019	07:23	68	44	83	29.66	NNW 11	weather.com app

Soil Vapor Collection Log Sheet

Office Name & Address (Reporting Information): Arcadis of Michigan, LLC, 28550 Cabot Drive, Suite 500, Novi, MI 48377		Project Name: Ford LTP Off-Site Sampling Project Number: MI001454.0003.00002	
Field Manager: Adam Richmond		Site Address: 12001 STARK	
Phone Number: 248-994-2240 Email Address for Result Reporting:Kristoffer.Hinskey@arcadis.com	Special Instructions: Report ONLY: 1,1-DCE, cis-1,2- DCE, trans-1,2-DCE, 1,4-Dioxane, PCE, TCE and VC. Submit results through Cadena at jim.tomalia@cadena.com. Cadena #E203631. Level IV Reporting.	Sampler Name: Hayden L Sampler Email Address: Hayden.L@arcadis.com	
Helium Detector Model Used:Dielectric MGD-2002	Helium Leak Test Method:Bucket Shroud	Summa Canister Size (1L, 2.7 L, 6L): 1 L	Lab: Eurofins

Sample ID	Sample Location Description	Date	Pre-Sampling Shut-In / Leak-Down Test	Helium Tracer Test - Performed During Sample Point Purge			Purge Volume (mL)	Purge Rate (mL/min)	Canister Number	Flow Controller Number	Sample Collection Start Time	Starting Canister Pressure	Sample Collection End Time	Ending Canister Pressure	Post-Sampling CO2 Reading from GEM (%)	Post-Sampling O2 Reading from GEM (%)	Micromanometer Reading
				Shroud Helium Concentration During Purge	Helium Reading in Purged Vapor	Helium Test Pass/Fail (Purge contains <5% of shroud to pass)?											
SSMP-12001STARK-01_041919	Garage	04/19/2019	Pass	47.3	0	Pass	100	100	1L2471	23820	07:28	-29	07:41	-5.5	0.5	21.3	0.00039

Meteorological Data

Date	Time	Indoor	Outdoor	Relative Humidity	Barometric Pressure	Source of Weather
04/19/2019	07:24	68	44	83	29.66	weather.com app

Purge Volume Calculations:

For sub-slab soil vapor samples the sample train tubing length is ~54 inches and the interior tubing radius is 0.085".
Three volumes of the sample train is 60 milliliters using the equation for volume of a cylinder (volume = pi * radius2 * height) where Volume = 60 ml, radius = 0.85" and height = 54".

TRANSMITTAL LETTER

ARCADIS Design & Consultancy for natural and built assets

To:
George Al-Husari
Shawn Collins
Brandon Alger (EGLE)
Todd Walton (Ford)
Chuck Pinter (Ford)
Rob Boley (Schiff Hardin LLP)

From:
Kris Hinskey

Arcadis of Michigan, LLC
28550 Cabot Drive
Suite 500
Novi
Michigan 48377
Tel 248 994 2240
Fax 248 994 2241

Copies:

Date:
November 12, 2019

Subject:
Vapor Intrusion Assessment
Data Package

We are sending you hard copies:

☒ **Attached** ☐ **Under Separate Cover Via _____ the Following Items:**

☐ Shop Drawings ☐ Plans ☐ Specifications ☐ Change Order
☐ Prints ☒ Samples ☐ Copy of Letter ☐ Reports
☐ Other:

Copies	Date	Drawing No.	Rev.	Description	Action*
1	11/13/2019			Figure	
1	11/13/2019			Analytical Results	
1	11/13/2019			Field Notes and Drawings	

Action*
☐ A Approved ☐ CR Correct and Resubmit ☐ Resubmit _____ Copies
☐ AN Approved As Noted ☐ F File ☐ Return _____ Copies
☐ AS As Requested ☐ FA For Approval ☐ Review and Comment
☐ Other:

Mailing Method
☐ U.S. Postal Service 1st Class ☐ Courier/Hand Delivery ☐ FedEx Priority Overnight ☐ FedEx 2-Day Delivery
☐ Certified/Registered Mail ☐ United Parcel Service (UPS) ☐ FedEx Standard Overnight ☐ FedEx Economy
☒ Other: email

Thank you for cooperating with the air sampling at your property on October 17 and 18, 2019. Attached is your data package.

LEGEND:

- INDOOR AIR LOCATION
- AMBIENT AIR LOCATION
- SUB-SLAB MONITORING POINT LOCATION
- BUILDING
- PROPERTY BOUNDARIES

0 15 30
SCALE IN FEET

FORD MOTOR COMPANY
LIVONIA TRANSMISSION PLANT
LIVONIA, MICHIGAN

AIR SAMPLING LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 1

CITY: NOVI DIV: ENV DB: MG PIC: R. ELLIS PM: K_HINSKEY TM: T. STEVENS TR: P. CURRY PROJECT NUMBER: MI001373.0001.00003 COORDINATE SYSTEM: NAD 1983 StatePlane Michigan South FIPS 2113 Feet
Z:\GISProjects_ENV\Novi\Brighton_MI\Ford\Livonia\GIS\docs\2018-11\12001_Stark_20181110.mxd PLOTTED: 11/12/2018 10:18:20 AM BY: mgress

eurofins | Air Toxics

11/8/2019
Mr. Jim Tomalia
Arcadis U.S., Inc.
28550 Cabot Dr.
Suite 500
Novi MI 48377

Project Name: Ford LTP
Project #:
Workorder #: 1910582R1

Dear Mr. Jim Tomalia

The following report includes the data for the above referenced project for sample(s) received on 10/24/2019 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

eurofins | Air Toxics

WORK ORDER #: 1910582R1

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. #**	30016344.0002B
FAX:		**PROJECT #**	Ford LTP
DATE RECEIVED:	10/24/2019	**CONTACT:**	Ausha Scott
DATE COMPLETED:	10/30/2019		
DATE REISSUED:	11/08/2019		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	SSMP-12001STARK-01_101819	TO-15	5.3 "Hg	15.3 psi
02A	DUP-12001STARK-01_101819	TO-15	5.1 "Hg	15 psi
03A	Lab Blank	TO-15	NA	NA
04A	CCV	TO-15	NA	NA
05A	LCS	TO-15	NA	NA
05AA	LCSD	TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 11/08/19

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP - 209218, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-18-13, UT NELAP – CA009332019-11, VA NELAP - 460197, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005-011, Effective date: 10/18/2019, Expiration date: 10/17/2020.
Eurofins Air Toxics, LLC certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 351-8279

LABORATORY NARRATIVE
EPA Method TO-15
Arcadis U.S., Inc.
Workorder# 1910582R1

Two 1 Liter Summa Canister (100% Certified) samples were received on October 24, 2019. 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 may be false positives.

The workorder was reissued on 11/8/19 to report results in ug/m3 as well as a different format per project specifications.

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-12001STARK-01_101819		
Lab ID:	1910582R1-01A	**Date/Time Analyzed:**	10/26/19 10:27 PM
Date/Time Collected:	10/18/19 09:26 AM	**Dilution Factor:**	2.48
Media:	1 Liter Summa Canister (100% Certified)	**Instrument/Filename:**	msd3.i / 3102620

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	1.1	2.4	4.9	Not Detected
1,4-Dioxane	123-91-1	0.93	5.6	18	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.77	2.4	4.9	Not Detected
Tetrachloroethene	127-18-4	1.2	4.2	8.4	2500
trans-1,2-Dichloroethene	156-60-5	1.0	2.4	4.9	Not Detected
Trichloroethene	79-01-6	0.85	3.3	6.7	Not Detected
Vinyl Chloride	75-01-4	0.53	1.6	3.2	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	100
Toluene-d8	2037-26-5	70-130	97

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

Client ID:	DUP-12001STARK-01_101819		
Lab ID:	1910582R1-02A	**Date/Time Analyzed:**	10/26/19 10:00 PM
Date/Time Collected:	10/18/19 12:00 AM	**Dilution Factor:**	2.43
Media:	1 Liter Summa Canister (100% Certified)	**Instrument/Filename:**	msd3.i / 3102619

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	1.1	2.4	4.8	Not Detected
1,4-Dioxane	123-91-1	0.91	5.5	18	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.76	2.4	4.8	Not Detected
Tetrachloroethene	127-18-4	1.2	4.1	8.2	2400
trans-1,2-Dichloroethene	156-60-5	1.0	2.4	4.8	Not Detected
Trichloroethene	79-01-6	0.84	3.3	6.5	Not Detected
Vinyl Chloride	75-01-4	0.52	1.6	3.1	Not Detected

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	99
Toluene-d8	2037-26-5	70-130	100

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

Client ID:	Lab Blank		
Lab ID:	1910582R1-03A	**Date/Time Analyzed:**	10/26/19 10:44 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd3.i / 3102605c

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.46	0.99	2.0	Not Detected
1,4-Dioxane	123-91-1	0.38	2.2	7.2	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.31	0.99	2.0	Not Detected
Tetrachloroethene	127-18-4	0.50	1.7	3.4	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.42	0.99	2.0	Not Detected
Trichloroethene	79-01-6	0.34	1.3	2.7	Not Detected
Vinyl Chloride	75-01-4	0.21	0.64	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	93
4-Bromofluorobenzene	460-00-4	70-130	101
Toluene-d8	2037-26-5	70-130	100

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

Client ID:	CCV		
Lab ID:	1910582R1-04A	**Date/Time Analyzed:**	10/26/19 09:11 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd3.i / 3102602

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	94
1,4-Dioxane	123-91-1	100
cis-1,2-Dichloroethene	156-59-2	104
Tetrachloroethene	127-18-4	105
trans-1,2-Dichloroethene	156-60-5	102
Trichloroethene	79-01-6	101
Vinyl Chloride	75-01-4	84

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	96
4-Bromofluorobenzene	460-00-4	70-130	102
Toluene-d8	2037-26-5	70-130	101

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

Client ID:	LCS		
Lab ID:	1910582R1-05A	**Date/Time Analyzed:**	10/26/19 09:37 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd3.i / 3102603

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	96
1,4-Dioxane	123-91-1	100
cis-1,2-Dichloroethene	156-59-2	107
Tetrachloroethene	127-18-4	102
trans-1,2-Dichloroethene	156-60-5	87
Trichloroethene	79-01-6	96
Vinyl Chloride	75-01-4	85

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	92
4-Bromofluorobenzene	460-00-4	70-130	100
Toluene-d8	2037-26-5	70-130	100

* % Recovery is calculated using unrounded analytical results.

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

Client ID:	LCSD		
Lab ID:	1910582R1-05AA	**Date/Time Analyzed:**	10/26/19 10:01 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd3.i / 3102604

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	96
1,4-Dioxane	123-91-1	98
cis-1,2-Dichloroethene	156-59-2	106
Tetrachloroethene	127-18-4	100
trans-1,2-Dichloroethene	156-60-5	87
Trichloroethene	79-01-6	94
Vinyl Chloride	75-01-4	87

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	102
Toluene-d8	2037-26-5	70-130	102

* % Recovery is calculated using unrounded analytical results.

REVISED REPORT: November 8, 2019
REVISION SUMMARY: Lab report format and sample results units revised at client request.

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: 30016344.0002B
Client project scope reference: Sample COC only was used to define project analytical requirements.
Laboratory: Eurofins Air Toxics - Folsom
Laboratory submittal: 1910582
Sample date: 2019-10-18
Report received by CADENA: 2019-10-30
Initial Data Verification completed: 2019-10-30

2 Air samples were analyzed for TO-15 parameters.

No data qualifications or sample integrity issues were observed.

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 Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

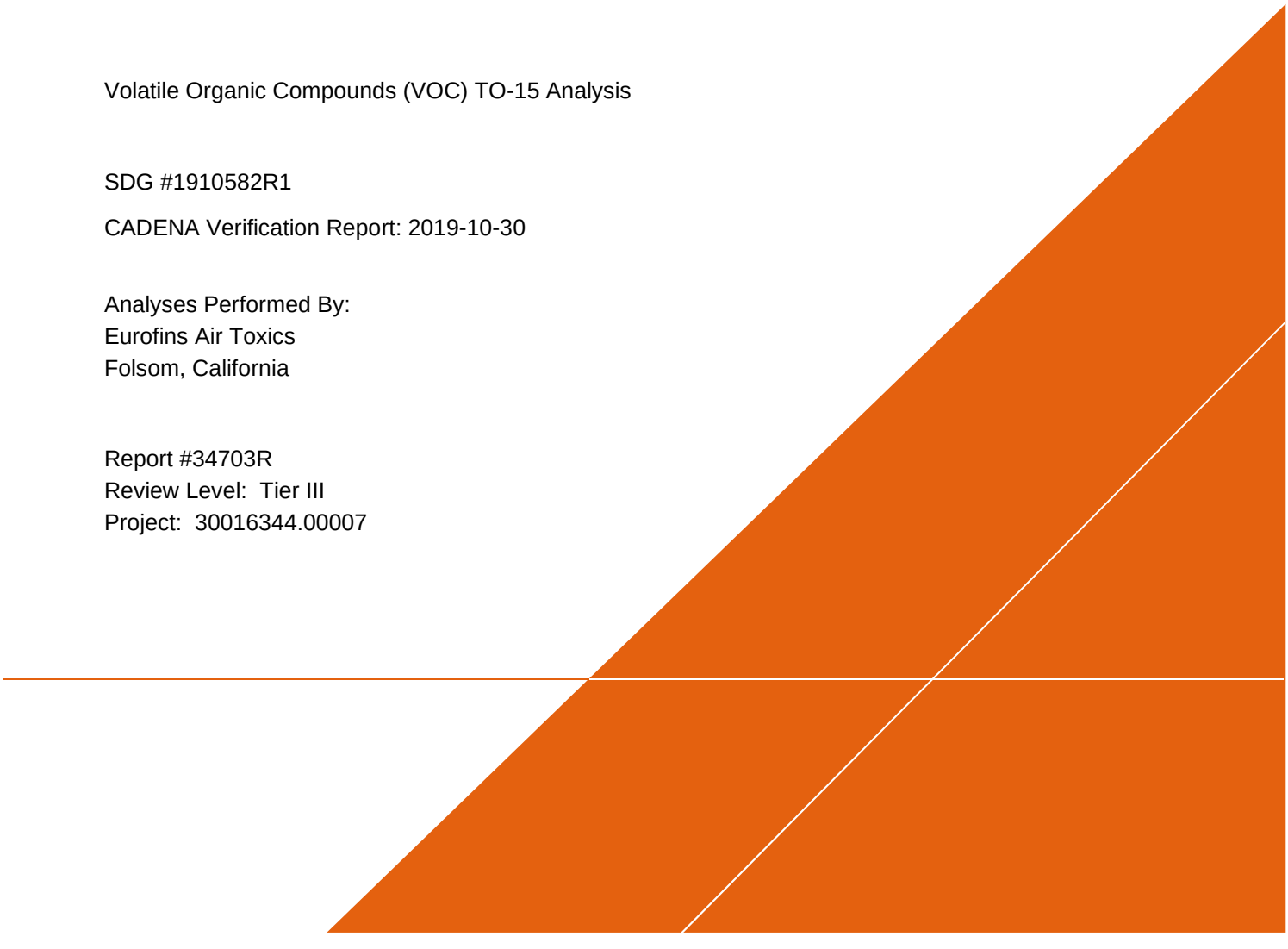
Volatile Organic Compounds (VOC) TO-15 Analysis

SDG #1910582R1

CADENA Verification Report: 2019-10-30

Analyses Performed By:
Eurofins Air Toxics
Folsom, California

Report #34703R
Review Level: Tier III
Project: 30016344.00007



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 1910582R1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

SDG	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
						TO-15 (Full Scan)	TO-15 (SIM)	MISC
1910582R1	SSMP-12001STARK-01_101819	1910582R1-01A	Air	10/18/2019		X		
	DUP-12001STARK-01_101819	1910582R1-02A	Air	10/18/2019	SSMP-12001STARK-01_101819	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) Method TO-15 (Full Scan). 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	Return Canister Pressure
USEPA TO-15	Air	30 days from collection to analysis (Canister)	Ambient Temperature	< -2" Hg

All samples were analyzed within the specified holding time and canister return pressure / vacuum 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 (30%) 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 (30%) and RRF value greater than control limit (0.05).

All compounds associated with the continuing 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 requires the internal standard compounds associated with the VOC exhibit area counts that are not greater than 140% or less than 60% of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Compound Identification

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

All identified compounds met the specified criteria.

6. Field Duplicate Sample Analysis

The field duplicate analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 35% for air 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 not greater than five times the RL, a control limit of one times the RL is applied to the difference between the duplicate sample results.

Results (in µg/m^3) for the field duplicate samples are summarized in the following table.

Sample ID / Duplicate ID	Compound	Sample Result	Duplicate Result	RPD
SSMP-12001STARK-01_101819/ DUP-12001STARK-01_101819	Tetrachloroethene	2500	2400	4.1%

The calculated RPDs between the parent sample and field duplicate were acceptable.

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 VALIDATION CHECKLIST FOR VOCs

VOCs: TO-15 (Full Scan)	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Canister return pressure (<-2"Hg)		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Field Duplicate Sample RPD		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Joseph C. Houser

SIGNATURE: 

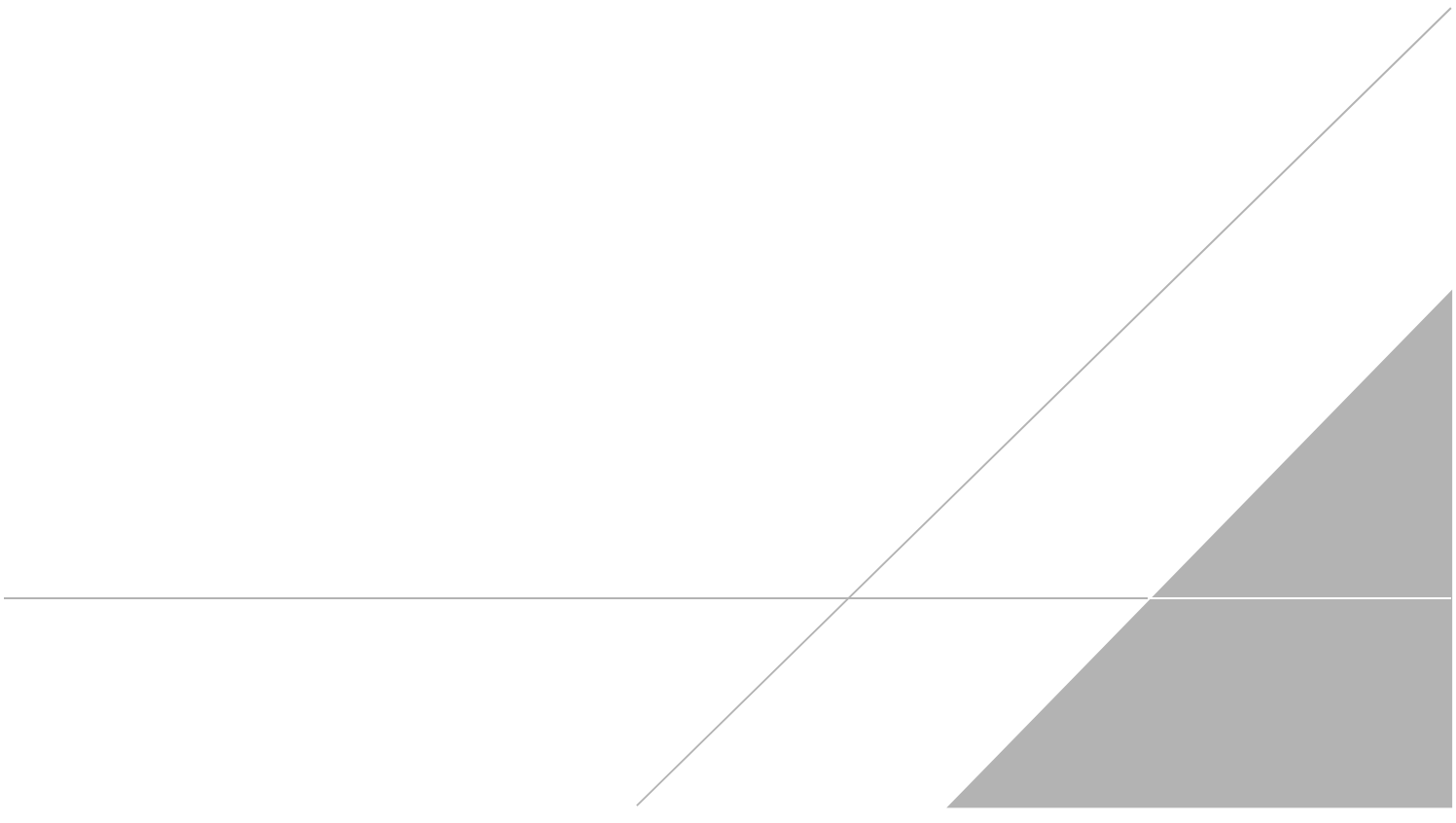
DATE: November 10, 2019

PEER REVIEW: Andrew Korycinski

DATE: November 11, 2019

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

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

Client ID:	SSMP-12001STARK-01_101819		
Lab ID:	1910582R1-01A	**Date/Time Analyzed:**	10/26/19 10:27 PM
Date/Time Collected:	10/18/19 09:26 AM	**Dilution Factor:**	2.48
Media:	1 Liter Summa Canister (100% Certified)	**Instrument/Filename:**	msd3.i / 3102620

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	1.1	2.4	4.9	Not Detected
1,4-Dioxane	123-91-1	0.93	5.6	18	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.77	2.4	4.9	Not Detected
Tetrachloroethene	127-18-4	1.2	4.2	8.4	2500
trans-1,2-Dichloroethene	156-60-5	1.0	2.4	4.9	Not Detected
Trichloroethene	79-01-6	0.85	3.3	6.7	Not Detected
Vinyl Chloride	75-01-4	0.53	1.6	3.2	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	100
Toluene-d8	2037-26-5	70-130	97

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

Client ID:	DUP-12001STARK-01_101819		
Lab ID:	1910582R1-02A	**Date/Time Analyzed:**	10/26/19 10:00 PM
Date/Time Collected:	10/18/19 12:00 AM	**Dilution Factor:**	2.43
Media:	1 Liter Summa Canister (100% Certified)	**Instrument/Filename:**	msd3.i / 3102619

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	1.1	2.4	4.8	Not Detected
1,4-Dioxane	123-91-1	0.91	5.5	18	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.76	2.4	4.8	Not Detected
Tetrachloroethene	127-18-4	1.2	4.1	8.2	2400
trans-1,2-Dichloroethene	156-60-5	1.0	2.4	4.8	Not Detected
Trichloroethene	79-01-6	0.84	3.3	6.5	Not Detected
Vinyl Chloride	75-01-4	0.52	1.6	3.1	Not Detected

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	99
Toluene-d8	2037-26-5	70-130	100

Analysis Request /Canister Chain of Custody

For Laboratory Use Only

PID: ____________ Workorder #: 1910582

180 Blue Ravine Rd. Suite B, Folsom, CA 95630
Phone (800) 985-5955; Fax (916) 351-8279

Click links below to view:
Canister Sampling Guide
Helium Shroud Video

Client:	Ford	PID:	NA
Project Name:	Ford LTP		
Project Manager:	Kris Hinskey	P.O.#	30016344.0002B
Sampler:	Xenia Chan		
Site Name:	12001 STARK		

Special Instructions/Notes: Report ONLY: 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, 1,4-Dioxane, PCE, TCE and VC. Submit results through Cadena at jim.tomalia@cadena.com. Cadena #E203631. Level IV Reporting

Turnaround Time (Rush surcharges may apply): 5 Day Turnaround Time

Lab ID	Sample Identification	Can #	Flow Controller #	Start Sampling Date	Start Sampling Time	Stop Sampling Date	Stop Sampling Time	Canister Vacuum/Pressure Initial (in Hg)	Canister Vacuum/Pressure Final (in Hg)	Lab Use Only Receipt	Lab Use Only Final (psig) Gas: N_2 / He	TO-15 (See Special Instructions/Notes)	Do Not Analyze		
01A	SSMP-12001STARK-01_101819	1L2593	24154	10/18/2019	9:14	10/18/2019	9:26	-29.5	-6			X			
02A	DUP-12001STARK-01_101819	1L2976	23352	10/18/2019	--	10/18/2019	--	-29	-6			X			
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Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
[signature]	10/22/19	1430	[signature]	10/24/19	0937

Lab Use Only

Shipper Name:	Custody Seals Intact?	Yes (circled)	No	None
FedEx				

Sample Transportation Notice: Relinquishing signature on this document indicates that samples are shipped in compliance with all applicable local, State, Federal, and international laws, regulations, and ordinances of any kind. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Eurofins Air Toxics against any claim, demand, or action, of any kind, related to the collection, handling, of shipping of samples. D.O.T Hotline (800) 467-4922

eurofins | Air Toxics

10/30/2019
Mr. Jim Tomalia
Arcadis U.S., Inc.
28550 Cabot Dr.
Suite 500
Novi MI 48377

Project Name: Ford LTP
Project #:
Workorder #: 1910584

Dear Mr. Jim Tomalia

The following report includes the data for the above referenced project for sample(s) received on 10/24/2019 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

eurofins | Air Toxics

WORK ORDER #: 1910584

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. #**	30016344.0002B
FAX:		**PROJECT #**	Ford LTP
DATE RECEIVED:	10/24/2019	**CONTACT:**	Ausha Scott
DATE COMPLETED:	10/30/2019		

FRACTION #	NAME	TEST	RECEIPT VAC./PRES.	FINAL PRESSURE
01A	IAG12001STARK-02_101819	Modified TO-15	5.3 "Hg	5.3 psi
02A	AA-12001STARK-01_101819	Modified TO-15	4.9 "Hg	5.1 psi
03A	IAF-12001STARK-03_101819	Modified TO-15	8.4 "Hg	4.8 psi
03B	IAF-12001STARK-03_101819	Modified TO-15	8.4 "Hg	4.8 psi
04A	Lab Blank	Modified TO-15	NA	NA
04B	Lab Blank	Modified TO-15	NA	NA
05A	CCV	Modified TO-15	NA	NA
05B	CCV	Modified TO-15	NA	NA
06A	LCS	Modified TO-15	NA	NA
06AA	LCSD	Modified TO-15	NA	NA
06B	LCS	Modified TO-15	NA	NA
06BB	LCSD	Modified TO-15	NA	NA

CERTIFIED BY: Heidi Hayes DATE: 10/30/19

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP - 209218, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-18-13, UT NELAP – CA009332019-11, VA NELAP - 460197, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005-011, Effective date: 10/18/2019, Expiration date: 10/17/2020.
Eurofins Air Toxics, LLC certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 351-8279

LABORATORY NARRATIVE
Modified TO-15
Arcadis U.S., Inc.
Workorder# 1910584

Three 6 Liter Summa Canister (100% Cert Ambient) samples were received on October 24, 2019. 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.

Requirement	***TO-15***	***ATL Modifications***
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.

The results for sample IAF-12001STARK-03_101819 in this report was acquired from two separate data files originating from the same analytical run. The two data files have the same base file name and are differentiated with a "sim" extension on the SIM data file.

Dilution was performed on sample IAF-12001STARK-03_101819 due to the presence of high level non-target species.

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:	IAG12001STARK-02_101819		
Lab ID:	1910584-01A	**Date/Time Analyzed:**	10/26/19 05:55 PM
Date/Time Collected:	10/18/19 09:58 AM	**Dilution Factor:**	1.65
Media:	6 Liter Summa Canister (100% Cert Ambier	**Instrument/Filename:**	msd20.i / 20102615

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.16	0.59	0.65	Not Detected
1,4-Dioxane	123-91-1	0.48	0.54	0.59	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.35	0.59	0.65	Not Detected
Tetrachloroethene	127-18-4	0.70	1.0	1.1	0.92 J
trans-1,2-Dichloroethene	156-60-5	0.37	0.59	0.65	Not Detected
Trichloroethene	79-01-6	0.44	0.80	0.89	Not Detected
Vinyl Chloride	75-01-4	0.14	0.38	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	116
4-Bromofluorobenzene	460-00-4	70-130	102
Toluene-d8	2037-26-5	70-130	99

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

Client ID:	AA-12001STARK-01_101819		
Lab ID:	1910584-02A	**Date/Time Analyzed:**	10/26/19 06:34 PM
Date/Time Collected:	10/18/19 09:02 AM	**Dilution Factor:**	1.61
Media:	6 Liter Summa Canister (100% Cert Ambier	**Instrument/Filename:**	msd20.i / 20102616

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.15	0.57	0.64	Not Detected
1,4-Dioxane	123-91-1	0.47	0.52	0.58	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.34	0.57	0.64	Not Detected
Tetrachloroethene	127-18-4	0.68	0.98	1.1	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.36	0.57	0.64	Not Detected
Trichloroethene	79-01-6	0.42	0.78	0.86	Not Detected
Vinyl Chloride	75-01-4	0.13	0.37	0.41	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	96
Toluene-d8	2037-26-5	70-130	97

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

Client ID:	IAF-12001STARK-03_101819		
Lab ID:	1910584-03A	**Date/Time Analyzed:**	10/26/19 07:13 PM
Date/Time Collected:	10/18/19 10:59 AM	**Dilution Factor:**	18.4
Media:	6 Liter Summa Canister (100% Cert Ambier	**Instrument/Filename:**	msd20.i / 20102617

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	1.8	6.6	7.3	Not Detected
1,4-Dioxane	123-91-1	5.4	6.0	6.6	Not Detected
cis-1,2-Dichloroethene	156-59-2	3.9	6.6	7.3	Not Detected
Tetrachloroethene	127-18-4	7.8	11	12	Not Detected
trans-1,2-Dichloroethene	156-60-5	4.1	6.6	7.3	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	104
4-Bromofluorobenzene	460-00-4	70-130	97
Toluene-d8	2037-26-5	70-130	96

MODIFIED EPA METHOD TO-15 GC/MS SIM
Ford LTP

Client ID:	IAF-12001STARK-03_101819		
Lab ID:	1910584-03B	**Date/Time Analyzed:**	10/26/19 07:13 PM
Date/Time Collected:	10/18/19 10:59 AM	**Dilution Factor:**	18.4
Media:	6 Liter Summa Canister (100% Cert Ambier	**Instrument/Filename:**	msd20.i / 20102617sim

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	79-01-6	0.19	0.59	2.0	Not Detected
Vinyl Chloride	75-01-4	0.12	0.28	0.47	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	96
Toluene-d8	2037-26-5	70-130	98

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

Client ID:	Lab Blank		
Lab ID:	1910584-04A	**Date/Time Analyzed:**	10/26/19 11:25 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd20.i / 20102606c

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.095	0.36	0.40	Not Detected
1,4-Dioxane	123-91-1	0.29	0.32	0.36	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.21	0.36	0.40	Not Detected
Tetrachloroethene	127-18-4	0.42	0.61	0.68	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.22	0.36	0.40	Not Detected
Trichloroethene	79-01-6	0.26	0.48	0.54	Not Detected
Vinyl Chloride	75-01-4	0.082	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	104
4-Bromofluorobenzene	460-00-4	70-130	99
Toluene-d8	2037-26-5	70-130	98

MODIFIED EPA METHOD TO-15 GC/MS SIM
Ford LTP

Client ID:	Lab Blank		
Lab ID:	1910584-04B	**Date/Time Analyzed:**	10/26/19 11:25 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd20.i / 20102606simc

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	79-01-6	0.010	0.032	0.11	Not Detected
Vinyl Chloride	75-01-4	0.0065	0.015	0.026	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	106
4-Bromofluorobenzene	460-00-4	70-130	100
Toluene-d8	2037-26-5	70-130	100

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

Client ID:	CCV		
Lab ID:	1910584-05A	**Date/Time Analyzed:**	10/26/19 08:49 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd20.i / 20102602

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	92
1,4-Dioxane	123-91-1	110
cis-1,2-Dichloroethene	156-59-2	100
Tetrachloroethene	127-18-4	100
trans-1,2-Dichloroethene	156-60-5	102
Trichloroethene	79-01-6	96
Vinyl Chloride	75-01-4	99

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	104
Toluene-d8	2037-26-5	70-130	104

MODIFIED EPA METHOD TO-15 GC/MS SIM
Ford LTP

Client ID:	CCV		
Lab ID:	1910584-05B	**Date/Time Analyzed:**	10/26/19 08:49 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd20.i / 20102602sim

Compound	CAS#	%Recovery
Trichloroethene	79-01-6	95
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	93
4-Bromofluorobenzene	460-00-4	70-130	105
Toluene-d8	2037-26-5	70-130	103

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

Client ID:	LCS		
Lab ID:	1910584-06A	**Date/Time Analyzed:**	10/26/19 09:28 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd20.i / 20102603

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	92
1,4-Dioxane	123-91-1	116
cis-1,2-Dichloroethene	156-59-2	95
Tetrachloroethene	127-18-4	102
trans-1,2-Dichloroethene	156-60-5	111
Trichloroethene	79-01-6	97
Vinyl Chloride	75-01-4	102

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	107
Toluene-d8	2037-26-5	70-130	102

* % Recovery is calculated using unrounded analytical results.

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

Client ID:	LCSD		
Lab ID:	1910584-06AA	**Date/Time Analyzed:**	10/26/19 10:07 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd20.i / 20102604

Compound	CAS#	%Recovery
1,1-Dichloroethene	75-35-4	98
1,4-Dioxane	123-91-1	113
cis-1,2-Dichloroethene	156-59-2	97
Tetrachloroethene	127-18-4	98
trans-1,2-Dichloroethene	156-60-5	113
Trichloroethene	79-01-6	94
Vinyl Chloride	75-01-4	105

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	106
Toluene-d8	2037-26-5	70-130	101

* % Recovery is calculated using unrounded analytical results.

MODIFIED EPA METHOD TO-15 GC/MS SIM
Ford LTP

Client ID:	LCS		
Lab ID:	1910584-06B	**Date/Time Analyzed:**	10/26/19 09:28 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd20.i / 20102603sim

Compound	CAS#	%Recovery
Trichloroethene	79-01-6	96
Vinyl Chloride	75-01-4	97

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	106
Toluene-d8	2037-26-5	70-130	102

* % Recovery is calculated using unrounded analytical results.

MODIFIED EPA METHOD TO-15 GC/MS SIM
Ford LTP

Client ID:	LCSD		
Lab ID:	1910584-06BB	**Date/Time Analyzed:**	10/26/19 10:07 AM
Date/Time Collected:	NA - Not Applicable	**Dilution Factor:**	1.00
Media:	NA - Not Applicable	**Instrument/Filename:**	msd20.i / 20102604sim

Compound	CAS#	%Recovery
Trichloroethene	79-01-6	96
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	104
Toluene-d8	2037-26-5	70-130	102

* % Recovery is calculated using unrounded analytical results.

Analysis Request /Canister Chain of Custody

For Laboratory Use Only

PID: ____________ Workorder #: ____________ 1910584

180 Blue Ravine Rd. Suite B, Folsom, CA 95630
Phone (800) 985-5955; Fax (916) 351-8279

Click links below to view:
Canister Sampling Guide
Helium Shroud Video

Client:	Ford
PID:	NA
Project Name:	Ford LTP
Project Manager:	Kris Hinskey
P.O.#	30016344.0002B
Sampler:	Xenia Chan
Site Name:	12001 STARK

Special Instructions/Notes: Report ONLY: 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, 1,4-Dioxane, PCE, TCE and VC. Submit results through Cadena at jim.tomalia@cadena.com. Cadena #E203631. Level IV Reporting

Turnaround Time (Rush surcharges may apply): 5 Day Turnaround Time

Lab ID	Sample Identification	Can #	Flow Controller #	Start Sampling Information		Stop Sampling Information		Canister Vacuum/Pressure		Lab Use Only		Requested Analyses			
				Date	Time	Date	Time	Initial (in Hg)	Final (in Hg)	Receipt	Final (psig) Gas: N_2 / He	TO-15 (See Special Instructions/Notes)	Do Not Analyze		
01A	IAG12001STARK-02_101819	6L2056	22469	10/17/2019	10:09	10/18/2019	9:58	-29.5	-6			X			
02A	AA-12001STARK-01_101819	6L2065	21012	10/17/2019	10:05	10/18/2019	9:02	-29.5	-6			X			
03A	IAF-12001STARK-03_101819	6L0091	22274	10/17/2019	10:08	10/18/2019	10:59	-29.5	-8			X			
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Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
[signature]	10/22/19	1430	[signature] EAA	10/24/19	0937

Lab Use Only

Shipper Name:	FedEx	Custody Seals Intact?	Yes (circled)	No	None

Sample Transportation Notice: Relinquishing signature on this document indicates that samples are shipped in compliance with all applicable local, State, Federal, and international laws, regulations, and ordinances of any kind. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Eurofins Air Toxics against any claim, demand, or action, of any kind, related to the collection, handling, of shipping of samples. D.O.T Hotline (800) 467-4922

October 30, 2019

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

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30016344.0002B
Client project scope reference: Sample COC only was used to define project analytical requirements.
Laboratory: Eurofins Air Toxics - Folsom
Laboratory submittal: 1910584
Sample date: 2019-10-18
Report received by CADENA: 2019-10-30
Initial Data Verification completed: 2019-10-30

3 Air samples were analyzed for TO-15 parameters.

No data qualifications or sample integrity issues were observed.

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 Valid Qualifiers

Valid Qualifiers	Description
<	Less than the reported concentration.
>	Greater than the reported concentration.
B	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was greater than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the reported concentration. For Inorganic methods the sample concentration was greater than the RDL and less than 10x the blank concentration and is considered non-detect at the reported concentration.
E	The analyte / Compound reported exceeds the calibration range and is considered estimated.
EMPC	Estimated Minimum Potential Contamination - Dioxin/Furan analyses only.
J	Indicates an estimated value. This flag is used either when estimating a concentration for a tentatively identified compound or when the data indicates the presence of an analyte / compound but the result is less than the sample Quantitation limit, but greater than zero. The flag is also used in data validation to indicate a reported value should be considered estimated due to associated quality assurance deficiencies.
J-	The result is an estimated quantity, but the result may be biased low.
JB	NON-DETECT AT THE CONCENTRATION REPORTED AND ESTIMATED
JH	The sample result is considered estimated and is potentially biased high.
JL	The sample result is considered estimated and is potentially biased low.
JUB	NON-DETECT AT THE REPORTING LIMIT AND ESTIMATED
NJ	Tentatively identified compound with approximated concentration.
R	Indicates the value is considered to be unusable. (Note: The analyte / compound may or may not be present.)
TNTC	Too Numerous to Count - Asbestos and Microbiological Results.
U	Indicates that the analyte / compound was analyzed for, but not detected.
UB	The analyte / compound was detected in the associated blank. For Organic methods the sample concentration was less than the RDL and less than 5x (or 10x for common lab contaminates) the blank concentration and is considered non-detect at the RDL. For Inorganic methods the sample concentration was less than the RDL and less than 10x the blank concentration and is considered non-detect at the RDL.
UJ	The analyte / compound was not detected above the reported sample Quantitation limit. However, the Quantitation limit is considered to be approximate due to associated quality assurance results and may or may not represent the actual limit of Quantitation to accurately and precisely report the analyte in the sample.

ARCADIS Design & Consultancy for natural and built assets

Ford Motor Company – Livonia Transmission Project

DATA REVIEW

Livonia, Michigan

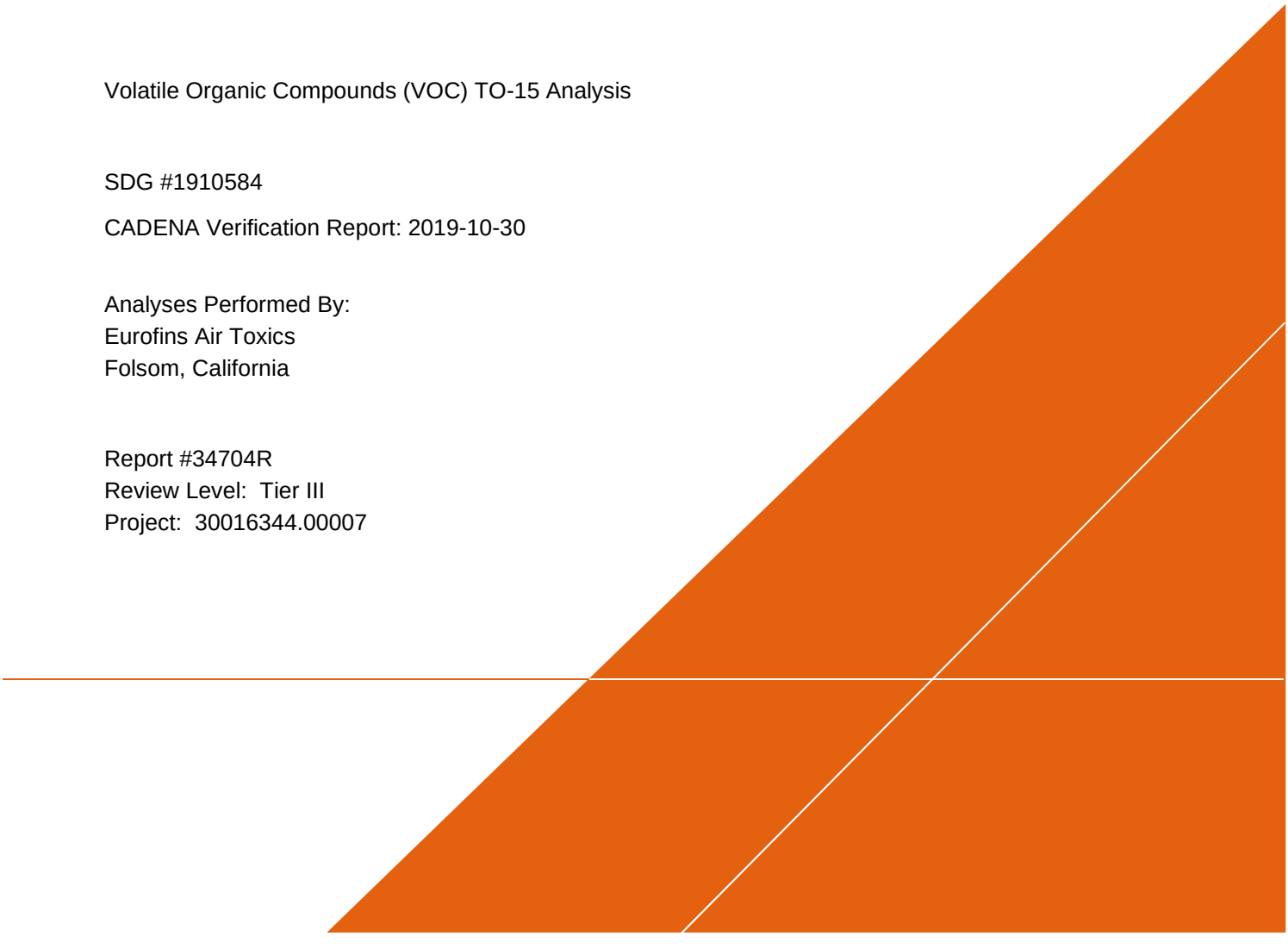
Volatile Organic Compounds (VOC) TO-15 Analysis

SDG #1910584

CADENA Verification Report: 2019-10-30

Analyses Performed By:
Eurofins Air Toxics
Folsom, California

Report #34704R
Review Level: Tier III
Project: 30016344.00007



SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 1910584 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

SDG	Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis		
						TO-15 (Full Scan)	TO-15 (SIM)	MISC
1910584	IAG12001STARK-02_101819	1910584-01A	Air	10/18/2019		X		
	AA-12001STARK-01_101819	1910584-02A	Air	10/18/2019		X		
	IAF-12001STARK-03_101819	1910584-03B	Air	10/18/2019		X	X	

DATA REVIEW

ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

DATA REVIEW

ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) Method TO-15 (Full Scan) and TO-15-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	Return Canister Pressure
USEPA TO-15 and USEPA TO-15-SIM	Air	30 days from collection to analysis (Canister)	Ambient Temperature	< -2" Hg

All samples were analyzed within the specified holding time and canister return pressure / vacuum 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 (30%) 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 (30%) and RRF value greater than control limit (0.05).

All compounds associated with the continuing 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 requires the internal standard compounds associated with the VOC exhibit area counts that are not greater than 140% or less than 60% of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

5. Compound Identification

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

All identified compounds met the specified criteria.

6. Field Duplicate Sample Analysis

The field duplicate analysis is used to assess the precision of the field sampling procedures and analytical method. A control limit of 35% for air 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 not greater than five times the RL, a control limit of one times the RL is applied to the difference between the duplicate sample results.

A field duplicate was not performed on a sample location within this SDG.

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 VALIDATION CHECKLIST FOR VOCs

VOCs: TO-15 (Full Scan) and TO-15 SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)					
Tier II Validation					
Canister return pressure (<-2"Hg)		X		X	
Tier III Validation					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Internal standard		X		X	
Field Duplicate Sample RPD					X
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

Notes:

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

%D Percent difference

VALIDATION PERFORMED BY: Joseph C. Houser

SIGNATURE: 

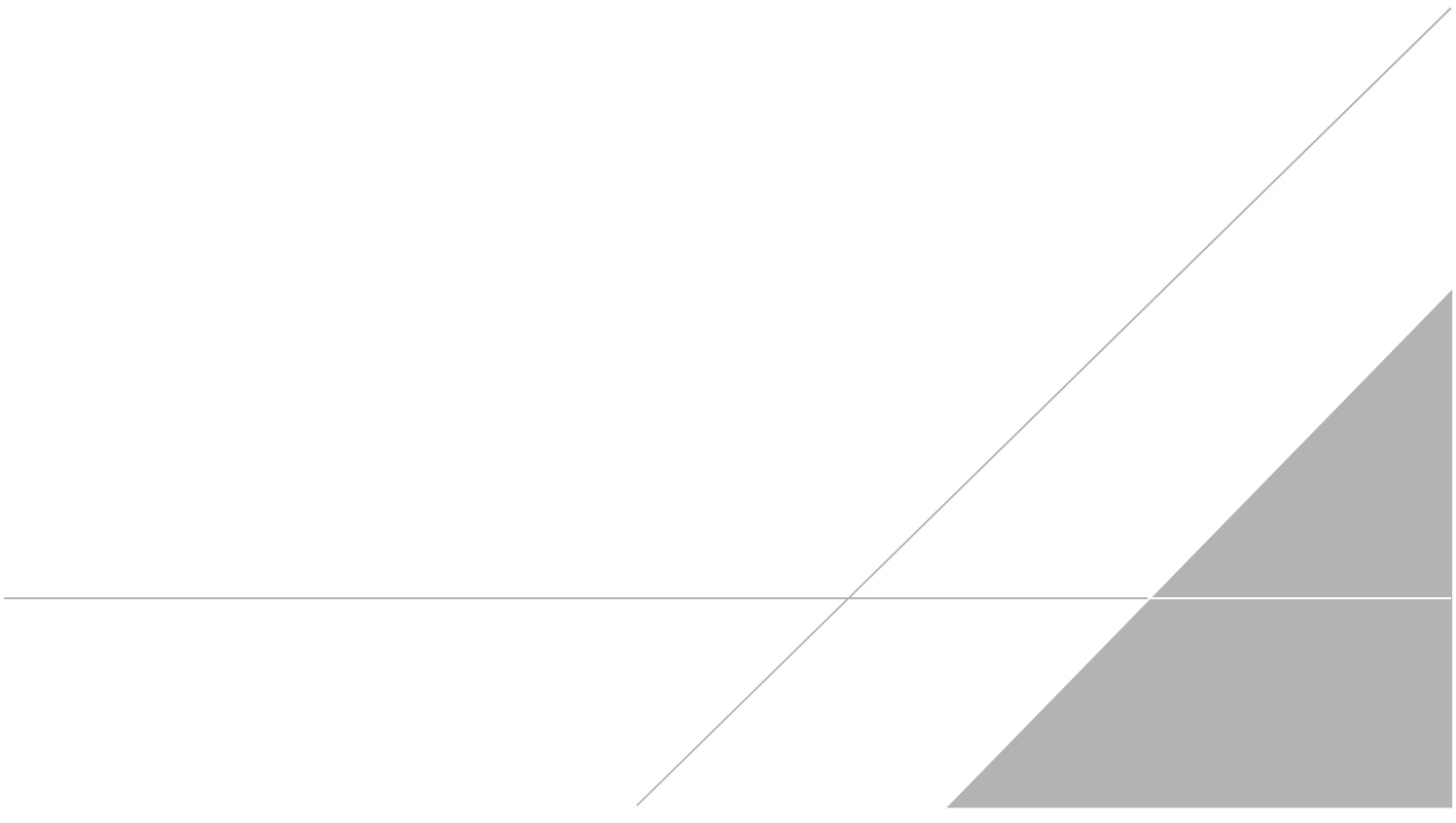
DATE: November 10, 2019

PEER REVIEW: Andrew Korycinski

DATE: November 11, 2019

CHAIN OF CUSTODY

CORRECTED SAMPLE ANALYSIS DATA SHEETS



NO CORRECTIONS/QUALIFERS ADDED TO SAMPLE ANALYSIS DATA SHEETS

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

Client ID:	IAG12001STARK-02_101819		
Lab ID:	1910584-01A	**Date/Time Analyzed:**	10/26/19 05:55 PM
Date/Time Collected:	10/18/19 09:58 AM	**Dilution Factor:**	1.65
Media:	6 Liter Summa Canister (100% Cert Ambier	**Instrument/Filename:**	msd20.i / 20102615

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.16	0.59	0.65	Not Detected
1,4-Dioxane	123-91-1	0.48	0.54	0.59	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.35	0.59	0.65	Not Detected
Tetrachloroethene	127-18-4	0.70	1.0	1.1	0.92 J
trans-1,2-Dichloroethene	156-60-5	0.37	0.59	0.65	Not Detected
Trichloroethene	79-01-6	0.44	0.80	0.89	Not Detected
Vinyl Chloride	75-01-4	0.14	0.38	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	116
4-Bromofluorobenzene	460-00-4	70-130	102
Toluene-d8	2037-26-5	70-130	99

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

Client ID:	AA-12001STARK-01_101819		
Lab ID:	1910584-02A	**Date/Time Analyzed:**	10/26/19 06:34 PM
Date/Time Collected:	10/18/19 09:02 AM	**Dilution Factor:**	1.61
Media:	6 Liter Summa Canister (100% Cert Ambier	**Instrument/Filename:**	msd20.i / 20102616

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	0.15	0.57	0.64	Not Detected
1,4-Dioxane	123-91-1	0.47	0.52	0.58	Not Detected
cis-1,2-Dichloroethene	156-59-2	0.34	0.57	0.64	Not Detected
Tetrachloroethene	127-18-4	0.68	0.98	1.1	Not Detected
trans-1,2-Dichloroethene	156-60-5	0.36	0.57	0.64	Not Detected
Trichloroethene	79-01-6	0.42	0.78	0.86	Not Detected
Vinyl Chloride	75-01-4	0.13	0.37	0.41	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	96
Toluene-d8	2037-26-5	70-130	97

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

Client ID:	IAF-12001STARK-03_101819		
Lab ID:	1910584-03A	**Date/Time Analyzed:**	10/26/19 07:13 PM
Date/Time Collected:	10/18/19 10:59 AM	**Dilution Factor:**	18.4
Media:	6 Liter Summa Canister (100% Cert Ambier	**Instrument/Filename:**	msd20.i / 20102617

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
1,1-Dichloroethene	75-35-4	1.8	6.6	7.3	Not Detected
1,4-Dioxane	123-91-1	5.4	6.0	6.6	Not Detected
cis-1,2-Dichloroethene	156-59-2	3.9	6.6	7.3	Not Detected
Tetrachloroethene	127-18-4	7.8	11	12	Not Detected
trans-1,2-Dichloroethene	156-60-5	4.1	6.6	7.3	Not Detected

D: Analyte not within the DoD scope of accreditation.

Surrogates	CAS#	Limits	%Recovery
1,2-Dichloroethane-d4	17060-07-0	70-130	104
4-Bromofluorobenzene	460-00-4	70-130	97
Toluene-d8	2037-26-5	70-130	96

MODIFIED EPA METHOD TO-15 GC/MS SIM
Ford LTP

Client ID:	IAF-12001STARK-03_101819		
Lab ID:	1910584-03B	**Date/Time Analyzed:**	10/26/19 07:13 PM
Date/Time Collected:	10/18/19 10:59 AM	**Dilution Factor:**	18.4
Media:	6 Liter Summa Canister (100% Cert Ambier	**Instrument/Filename:**	msd20.i / 20102617sim

Compound	CAS#	MDL (ug/m3)	LOD (ug/m3)	Rpt. Limit (ug/m3)	Amount (ug/m3)
Trichloroethene	79-01-6	0.19	0.59	2.0	Not Detected
Vinyl Chloride	75-01-4	0.12	0.28	0.47	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	96
Toluene-d8	2037-26-5	70-130	98

Analysis Request /Canister Chain of Custody

For Laboratory Use Only

PID: ____________ Workorder #: ____________ 1910584

180 Blue Ravine Rd. Suite B, Folsom, CA 95630
Phone (800) 985-5955; Fax (916) 351-8279

Click links below to view:
Canister Sampling Guide
Helium Shroud Video

Client: Ford
PID: NA
Project Name: Ford LTP
Project Manager: Kris Hinskey
P.O.# 30016344.0002B
Sampler: Xenia Chan
Site Name: 12001 STARK

Special Instructions/Notes: Report ONLY: 1,1-DCE, cis-1,2-DCE, trans-1,2-DCE, 1,4-Dioxane, PCE, TCE and VC. Submit results through Cadena at jim.tomalia@cadena.com. Cadena #E203631. Level IV Reporting

Turnaround Time (Rush surcharges may apply)
5 Day Turnaround Time

Lab ID	Sample Identification	Can #	Flow Controller #	Start Sampling Information Date	Start Sampling Information Time	Stop Sampling Information Date	Stop Sampling Information Time	Canister Vacuum/Pressure Initial (in Hg)	Canister Vacuum/Pressure Final (in Hg)	Lab Use Only Receipt	Lab Use Only Final (psig) Gas: N_2 / He	TO-15 (See Special Instructions/Notes)	Do Not Analyze		
01A	IAG12001STARK-02_101819	6L2056	22469	10/17/2019	10:09	10/18/2019	9:58	-29.5	-6			X			
02A	AA-12001STARK-01_101819	6L2065	21012	10/17/2019	10:05	10/18/2019	9:02	-29.5	-6			X			
03A	IAF-12001STARK-03_101819	6L0091	22274	10/17/2019	10:08	10/18/2019	10:59	-29.5	-8			X			
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Relinquished by: (Signature/Affiliation)	Date	Time	Received by: (Signature/Affiliation)	Date	Time
[signature]	10/22/19	1430	[signature] EAA	10/24/19	0937

Lab Use Only

Shipper Name: FedEx | Custody Seals Intact? (Yes) No None

Sample Transportation Notice: Relinquishing signature on this document indicates that samples are shipped in compliance with all applicable local, State, Federal, and international laws, regulations, and ordinances of any kind. Relinquishing signature also indicates agreement to hold harmless, defend, and indemnify Eurofins Air Toxics against any claim, demand, or action, of any kind, related to the collection, handling, of shipping of samples. D.O.T Hotline (800) 467-4922

Daily Log - Ford Off Site VI Investigation - VISIT 1

Project No.: MI001454.0003.00002 / 30016344

Site Location: 12001 STARK

Personnel Onsite: Xenia Chan, Patrick Labadie

Date	Time	Description of Activities
10/16/2019		Purpose: R3V1, building survey, chemical inventory
		Weather: 48.02 degrees F and Cloudy
		Equipment: PID 6153
	8:28	Arcadis on-site
	8:31	Conducted chemical inventory and survey; request doors and windows shut during sampling
	8:37	Arcadis off-site
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Visit 1 Checklist

Keeping windows & doors shut during IA/AA sampling was discussed? yes Field Staff Signature: Xen Chan

Have background sources of VOCs been removed/isolated? yes

Is a sump pit present in the building? no

Location of removed/isolated background VOCs: Tote outside of garage

Daily Log - Ford Off Site VI Investigation - VISIT 2

Project No.: MI001454.0003.00002 / 30016344

Site Location: 12001 STARK

Personnel Onsite: Xenia Chan, Patrick Labadie, and Hayden Ladd

Date	Time	Description of Activities
10/17/2019		Purpose: R3V2, canister deployment
		Weather: 53.96 degrees F and Mostly Cloudy
		Equipment: PID 6153
	9:58	Arcadis onsite
	10:08	Deployed canisters
	10:19	Arcadis off-site
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Visit 2 Checklist

Windows and doors are shut (for IA samples only)? yes

Have background sources of VOCs been removed/isolated? yes

Field Staff Signature:

Number of SSMP samples collected: 0

Number of indoor/ambient air samples collected: 0

Occupancy hours (for commercial properties only): --

Daily Log - Ford Off Site VI Investigation - VISIT 3

Project No.: MI001454.0003.00002 / 30016344

Site Location: 12001 STARK

Personnel Onsite: Julia McClafferty, Xenia Chan

Date	Time	Description of Activities
10/18/2019		Purpose: R3V3, canister deployment and ssmp sampling
		Weather: 37.04 degrees F and Clear
		Equipment: GEM 3782
	8:53	Arrive onsite, conduct canister collection and ssmp sampling
	10:05	Arcadis offsite
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Visit 3 Checklist

Windows and doors are shut (for IA samples only)? yes

Have background sources of VOCs been removed/isolated? yes

Field Staff Signature:

Number of SSMP samples collected: 1

Number of indoor/ambient air samples collected: 3

Occupancy hours (for commercial properties only): --

Remediation and Redevelopment Division
Standard Operating Procedure
Date: February 1, 2013

Indoor Air Sampling Procedure Via USEPA Method TO-15

INDOOR AIR BUILDING SURVEY AND SAMPLING FORM

Date: 10-29-18 (4-17-19) Survey Performed by: Hayden Lutt ~~Ellen R~~ Madison Olender ER

1. OCCUPANT:

Rent: ____ Own: X

10-16-19. X. Chan R3 P. Labadie - owner states no ~~[illegible]~~ changes since last visit

Resident Name: George Hyari

Address: 12001 Stark Rd.

Telephone: Home: 734 968 7934 Work: ____

Cell: ↑

How long have you lived at this location? Since August 2011

List current occupants/occupation below (attach additional pages if necessary):

Age (If under 18)	Sex (M/F)	Occupation
None		

2. OWNER OR LANDLORD: (If same as occupant, check here √ and go to Item No. 3).

Last Name: _____ First Name: _____

Address: _____

City and State: _____

County: _____

Home Phone: _____ Office Phone: _____

INDOOR AIR BUILDING SURVEY AND SAMPLING FORM (continued)

3. SENSITIVE POPULATION:

Daycare/Nursing Home/Hospital/School/Other (specify): None

4. BUILDING CHARACTERISTICS:

Residential/Multi-family Residential/Office/Strip Mall/Commercial/Industrial/School

Describe Building: Residential Year Constructed: _____

Number of floors at or above grade: 1

Number of floors below grade: 0 (full basement/crawl space/slab on grade)

Depth of structure below grade: 0 ft. Basement size: 0 ft²

If the property is residential, what type? (Circle all appropriate responses.)

Ranch	2-Family	3-Family	Raised Ranch
~~Split-Level~~	Colonial	Cape Cod	Contemporary
Mobile Home	Duplex	Apartment House	Townhouses/Condos
Modular	Log Home	Other: _____	

If multiple units, how many? _____

If the property is commercial:

Business type(s) NA

Does it include residences (i.e., multi-use)? Yes No If yes, how many? _____

5. OCCUPANCY:

Is basement/lowest level occupied? (Circle one)

Full-time Occasionally Seldom Almost Never

INDOOR AIR BUILDING SURVEY AND SAMPLING FORM (continued)

Level	General Use (e.g., family room, bedroom, laundry, workshop, storage)
Basement	NA
1st Floor	General use
2nd Floor	
3rd Floor	
4th Floor	

(Use additional page(s) as necessary)

6. CONSTRUCTION CHARACTERISTICS: (Circle all that apply.)

a. Above Grade Construction: (Describe type: wood frame, concrete, stone, brick).

b. Basement Type: Full (Crawlspace) Slab Other: _____

c. Basement Floor: Concrete Dirt Stone Other: Sand

d. Finished Basement Floor: Uncovered Covered NA

If covered, what with? NA

e. Foundation Walls: Poured (Block) Stone Other: _____

f. Foundation Walls: (Unsealed) Sealed Sealed with: _____

g. The Basement is: Wet Damp Dry NA

h. The Basement is: Finished Unfinished Partially Finished NA

i. Sump Present (Y / (N)) If yes, how many? NA

Where Discharged? NA

Water in Sump? Yes No (Not Applicable)

INDOOR AIR BUILDING SURVEY AND SAMPLING FORM (continued)

Identify all potential soil vapor entry points and estimated size (e.g., cracks, utility parts, drains).

Drains in garage area. Some cracks

Are the basement walls or floor sealed with waterproof paint or epoxy coatings? Yes (No)

Type of ground cover outside of building: Grass (Concrete) Asphalt Other _____

Is an existing subsurface depressurization (radon) system in place? Yes (No)

If yes, is it active, or passive?

Is a sub-slab vapor/moisture barrier in place? Yes (No)

Type of barrier: NA

7. HEATING, VENTING, and AIR CONDITIONING

Type of heating system(s) used in this building: (Circle all that apply: Note the primary).

(Hot Air Circulation)	Heat Pump	Hot Water Baseboard
Space Heaters	Steam Radiation	Radiant Floor
Electric Baseboard	Wood Stove	Outdoor Wood Boiler
Other: _____		

The primary type of fuel used is:

(Natural Gas)	Fuel Oil	Kerosene
~~Electric~~	Propane	Solar
Wood	Coal	

Domestic hot water tank fueled by: Natural gas

Location of Boiler/Furnace: Basement Outdoors (Main Floor) Other _____

INDOOR AIR BUILDING SURVEY AND SAMPLING FORM (continued)

Air Conditioning: (Central Air) Window Units Open Windows None

Are air distribution ducts present? (Yes) No

Is there a whole house fan? (Yes) No

Describe the air intake system (outside air supply, cold air return, ductwork, etc.) and its condition where visible. Indicate the locations on the floor plan diagram.

Ductwork is in good condition

8. FACTORS THAT MAY INFLUENCE INDOOR AIR QUALITY

a) Is there an attached garage? (Yes) No

If yes, does it have a separate heating unit? (Yes) No

b) Are any petroleum-powered machines or vehicles stored in an attached garage (e.g., lawn mower, ATV, car) (Yes) No

c) Has the building ever had a fire? Yes (No)

d) Is there a fuel burning or unvented gas space heater? Yes (No)

e) Is there a workshop or hobby/craft area? Yes (No)

If yes, where and what type? _____

f) Is there smoking in the building? Yes (No)

If yes, how frequently? _____

INDOOR AIR BUILDING SURVEY AND SAMPLING FORM (continued)

g) Have cleaning products been used recently? (Yes) No

If yes, when and what type? General purpose

h) Have cosmetic products been used recently? Yes (No)

If yes, when and what type? _____

i) Has there been painting or staining in the last six months? Yes (No)

If yes, when and where? _____

j) Is there new carpet, drapes, or other textiles? Yes (No)

If yes, when and where? _____

k) Have air fresheners been used recently? (Yes) No

If yes, when and what type? Spray cans

l) Is there a kitchen exhaust fan? Yes (No)

If yes, where is it vented? _____

m) Is there a clothes dryer? (Yes) No

If yes, is it vented outside? (Yes) No

n) Has there been a pesticide application? (Yes) No

If yes, when and what type? Bug Spray used last Summer

o) Are there odors in the building? Yes (No)

If yes, please describe: _____

INDOOR AIR BUILDING SURVEY AND SAMPLING FORM (continued)

p) Do any of the building occupants use solvents at work (e.g., chemical manufacturing or laboratory, auto mechanic or auto body shop, painting, fuel oil delivery, boiler mechanic, pesticide application, cosmetology)?

Yes (No)

If yes, what types of solvents are used? NA

If yes, are their clothes washed at work? Yes (No)

q) Do any of the building occupants regularly use or work at a dry-cleaning service? (Circle appropriate response.)

(No)

Unknown

Yes, use dry-cleaning regularly (weekly)

Yes, use dry-cleaning infrequently (monthly or less) → every 2 weeks

Yes, work at a dry-cleaning service

r) Is there a radon mitigation system for the building/structure? Yes (No)

If yes, what is date of installation? NA Active Passive

s) Additional mitigation system information (fan size, location, operating status, liner installed, etc.):

None

t) Is there an irrigation well, or any other well, present at the property: Yes (No)

If yes, please describe placement, use, and history below.

NA

PRODUCT INVENTORY FORM:

Make and Model of field instrument used: ppb RAE 3000

List specific products found in the residence or area that have the potential to affect indoor air quality (e.g., gasoline or kerosene storage cans, glues, paints, cleaning solvents/products, polishes/waxes, new furniture/ carpet, nail polish/hairspray/cologne).

Potential Source	Location	Size and Condition	Chemical Ingredients	Field Instrument Reading (units)	Photo Y/N
Gasoline Storage Cans and Equipment	Garage				
Kerosene Storage Cans	—				
Paints/Thinners/Strippers	Garage				
Cleaning Solvents	~~Garage~~ 4C				
Hobby Supplies – Glue, Paint, Etc.	—				
Oven Cleaner	—				
Carpet/Upholstery Cleaners	Kitchen				
Household Cleaners (non-solvent)	Kitchen				
Moth Balls	Garage				
Polishes/Waxes	—				
Insecticides	Garage				
Furniture/Floor Polish	—				
Hairspray	—				
Cologne/Perfume	Bathroom				
Air Fresheners	Bathroom				
Interior Fuel Tank	—				
Wood Stove/Fireplace	living room				
New Furniture/Upholstery	—				
New Carpeting/Flooring	—				
Others (fill in below)					
Motorcycle					
Snowblower					
Weed Wacker					
Note – Chemicals of concern moved into tote and placed outside garage					

3V1

* Spray foam
* glass cleaner
* brake cleaner

Great Stuff
Great Stuff
Parts Master

Garage PID: 97 ppb
Chemical Tote PID: 577 ppb

Product Inventory Form

I.e. gasoline cans/equipment, kerosene, paints/thinners/strippers, cleaning solvents, hobby supplies (glues), oven cleaner, carpet/upholstery cleaners, household cleaners, moth balls, polishes/waxes, insecticides, furniture/floor polish, hairspray, cologne/perfume, air fresheners, interior fuel tank, wood stove/fireplace, new furniture/upholstery, new carpet/flooring

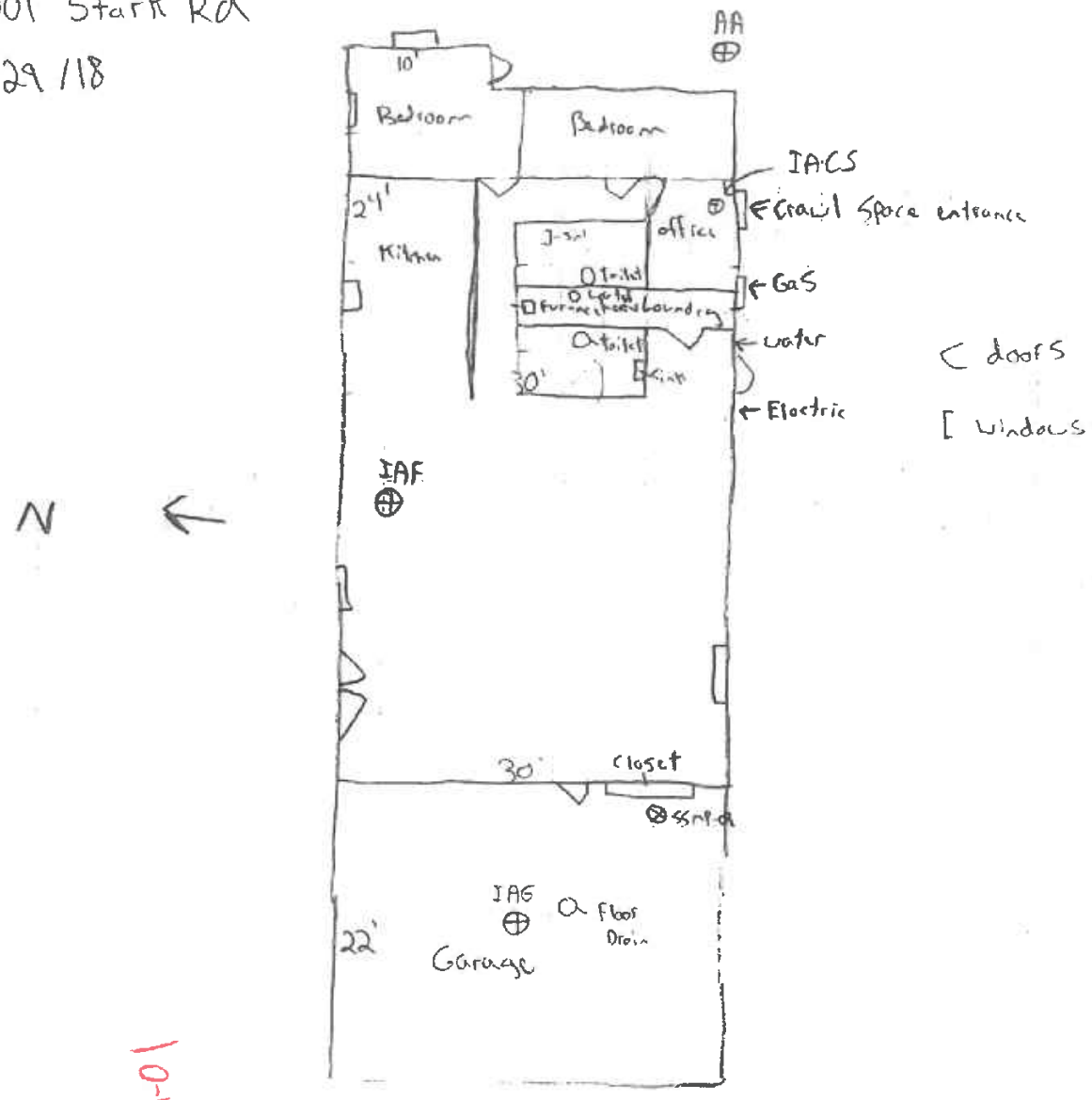
Location	Product Description	Chemical Ingredients	Quantity	PID Reading (ppb)	Photo	Removed (Y/N)
Garage	Moth balls	VOCs		0	Y	Y
Garage	Ortho Home defense	insecticides	2 containers	0	Y	Y
Garage	Rust penetrant	VOCs	Multiple	0	Y	Y
First Floor	Glade-Solid air	VOCs	Multiple	0	Y	Y
Garage	AC Freshener					
Garage	Brakleen	VOCs		0	Y	Y
First Floor	Resolve-Pet Expert	Various	1	0	Y	Y
First Floor	Scotch-guard Auto fabric cleaner	Various	1	0	N	Y
Garage	Rustoleum - High Performance Enamel	VOCs	1	0	N	Y
Garage	Gunk-Engine degreaser	VOCs	1	0	N	Y
Garage	Brazilian Carnauba Cleaner Wax	VOCs	1	0	N	Y
Garage	WD-40	VOCs	1	0	N	Y
Garage	Bulls Eye Shellac	VOCs	1	0	N	Y
Garage	Flex Seal	VOCs	1	0	Y	Y
First Floor	Kiw.-Lamp Dry	VOCs	1	0	N	Y
Garage	Gasoline	VOCs	3	500	Y	Y
Garage	Scrubbing brushes		2	0	Y	Y
	Homework Carpet cleaner		1			
	Caulk		4			
	Gutter sealer		1			
	Off backyard pre-treat		1			
	Round up		1			
	Brake fluid		1			
	Power steering fluid		1			

still in same tote

0 ppb

R3V1 Chemicals all in the same tote

Donald Richmond
12001 Starr Rd
10/29/18



R3 AA-01

~~R2~~ AA-01
Dup

- SB and IACs only collected during R1 sampling.

![ARCADIS]

Indoor/Ambient Air Collection Log Sheet

Office Name & Address (Reporting Information): Arcadis of Michigan, LLC 28550 Cabot Drive, Suite 500, Novi, MI 48377	Project Name: Ford LTP Off-site Sampling
	Project Number: MI001454.0003 / 30016344
Field Manager: Adam Richmond	Site Address: 12001 STARK
Phone Number: 248.994.2240	Special Instructions: Report ONLY: 1,1-DCE, cis-1,2- DCE, trans-1,2-DCE, 1,4-Dioxane, PCE, TCE and VC. Submit results through Cadena at jim.tomalia@cadena.com. Cadena #E203631. Level IV Reporting.
Email Address for Result Reporting: Kristoffer.Hinskey@arcadis.com	Sampler Name: Xenia Chan
Summa Canister Size (1L, 2.7 L, 6L) 6 Liter	Lab: Eurofins

												HVAC System Information						
Sample ID	Sample Location Description	Indoor/ Outdoor	PID in Sampling Area (ppb)	Canister Number	Flow Controller Number	Sample Collection Start Date	Sample Collection Start Time	Beginning Canister Pressure (in. Hg)	Sample Collection End Date	Sample Collection End Time	Ending Canister Pressure (in. Hg)	HVAC Fan On Start?	HVAC Fan On End?	Heat On Start?	Heat On End?	Temperature Setting (°F) Start	Temperature Setting (°F) End	Notes
IAG12001STARK-02_101819	Garage	Indoor	40	6L2056	22469	10/17/2019	10:09	-29.5	10/18/2019	9:58	-6	Yes	yes	No	No	65	65	--
AA-12001STARK-01_101819	NW of house	Outdoor	3	6L2065	21012	10/17/2019	10:05	-29.5	10/18/2019	9:02	-6	--	--	--	--	--	--	--
IAF-12001STARK-03_101819	Living room table	Indoor	454	6L0091	22274	10/17/2019	10:08	-29.5	10/18/2019	10:59	-8	Yes	yes	No	No	65	65	--
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Meteorological Data

Date	Time	Temp. (ºF)		Relative Humidity (%)	Barometric Pressure (in. Hg)	Air Speed (mph)	Source of Weather Information
		Indoor	Outdoor				
10/17/2019	9:59	65	45	70	29.89	NW 15	weather.com app
10/18/2019	9:15	65	42	80	30.11	NW 4	weather.com app
--	--	--	--	--	--	--	weather.com app
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General Notes or Observations

ARCADIS

Soil Vapor Collection Log Sheet

Office Name & Address (Reporting Information): Arcadis of Michigan, LLC 28550 Cabot Drive, Suite 500, Novi, MI 48377	Project Name: Ford LTP Off-site Sampling Project Number: MI001454.0003 / 30016344
Field Manager: Adam Richmond	Site Address: 12001 STARK
Phone Number: 248.994.2240 Email Address for Result Reporting: Kristoffer.Hinskey@arcadis.com	Special Instructions: Report ONLY: 1,1-DCE, cis-1,2- DCE, trans-1,2-DCE, 1,4-Dioxane, PCE, TCE and VC. Submit results through Cadena at jim.tomalia@cadena.com. Cadena #E203631. Level IV Reporting.
	Sampler Name: Xenia Chan
Helium Detector Model Used: Dielectric MGD-2002	Helium Leak Test Method: Bucket Shroud
Summa Canister Size (1L, 2.7 L, 6L): 1 Liter	Lab: Eurofins

Sample ID	Sample Location Description	Date	Pre-Sampling Shut-In / Leak-Down Test Pass/Fail?	Helium Tracer Test - Performed During Sample Point Purge: Shroud Helium Concentration During Purge (% Helium)	Helium Reading in Purged Vapor (% Helium)	Helium Test Pass/Fail (Purge contains <5% of shroud to pass)?	Purge Volume (mL)	Purge Rate (mL/min)	Canister Number	Flow Controller Number	Sample Collection Start Time	Starting Canister Pressure (in. Hg)	Sample Collection End Time	Ending Canister Pressure (in. Hg)	Post-Sampling CO_2 Reading from GEM (%)	Post-Sampling O_2 Reading from GEM (%)	Micromanometer Reading (in. WC)
SSMP-12001STARK-01_101819	Garage	10/18/2019	Pass	49.8	0	Pass	100	100	1L2593	24154	9:14	-29.5	9:26	-6	1.1	19.3	-0.00018
DUP-12001STARK-01_101819	Garage	10/18/2019	Pass	49.8	0	Pass	100	100	1L2976	23352	9:14	-29	9:29	-6	1.1	19.3	-0.00018
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Meteorological Data

Date	Time	Temp. (ºF) Indoor	Temp. (ºF) Outdoor	Relative Humidity (%)	Barometric Pressure (in. Hg)	Source of Weather Information
10/18/2019	9:05	65	42	80	30.10	weather.com app
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--	--	--	--	--	--	weather.com app
--	--	--	--	--	--	weather.com app

Purge Volume Calculations:

The purge volume for each sample has been pre-calculated using the information below.

For sub-slab soil vapor samples the sample train tubing length is ~54 inches and the interior tubing radius is 0.085".
Three volumes of the sample train is 60 milliliters using the equation for volume of a cylinder (volume = pi * radius^2 * height) where Volume = 60 ml, radius = 0.85" and height = 54".
To have sufficient volume to conduct helium leak testing 100 milliliters should be purged from each sample point.

For exterior soil vapor sampling 60 milliliters should be used for the above ground sample train.
Each additional foot of sub-grade tubing account for approximately 13 ml.
To have sufficient volume to conduct helium leak testing at least 100 milliliters should be purged from each sample point.

General Notes or Observations

ATTACHMENT 3

Off-Site Groundwater Analytical Data

Table 4
Off-Site Groundwater Analytical Results
Ford Livonia Transmission Plant
36200 Plymouth Road
Livonia, Michigan

Location:		Residential Drinking Water Criteria	MW-72										MW-72S				MW-73D									
Screen Interval (ft. bgs):			15-20										3-13				13.5-18.5									
Date:	Unit		5/22/2017	7/26/2017	11/7/2017	2/6/2018	5/9/2018	8/10/2018	10/22/2018	3/5/2019	5/17/2019	9/23/2019	12/17/2018	3/5/2019	5/8/2019	9/23/2019	5/22/2017	7/26/2017	11/7/2017	2/6/2018	5/9/2018	8/10/2018	10/22/2018	3/4/2019	5/8/2019	9/24/2019
Semi-volatile Organic Compounds (SVOCs)																										
1,4-Dioxane	µg/l	7.2	1.1 J	0.53 J	0.97 J	0.78 J	0.32 J	1.1 J	1.4 J	0.91 J	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	3.2	3.1	2.8	1.5 J	3.0	1.9 J	3.8	1.6 J	2.3	3.8
Volatile Organic Compounds (VOCs)																										
1,1-Dichloroethene	µg/l	7.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	µg/l	70	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	0.45 J	0.50 J	0.43 J	0.35 J	0.56 J	0.19 J	0.30 J	< 1.0	< 1.0
Tetrachloroethene	µg/l	5.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	µg/l	100	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.20 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.19 J	< 1.0	< 1.0
Vinyl chloride	µg/l	1.0	**3.9**	**2.9**	**1.6**	**1.3**	**1.5 J**	**1.2**	**1.1**	**1.9**	**1.7**	**1.5**	< 1.0	0.24 J	< 1.0	< 1.0	**1.1**	0.85 J	**1.3**	0.79 J	0.80 J	0.75 J	< 1.0	0.71 J	< 1.0	0.48 J
Metals																										
Iron, Dissolved	µg/l	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Total	µg/l	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	µg/l	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Total	µg/l	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anions																										
Nitrate-N	mg/l	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	mg/l	250	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (TOC)																										
Carbon, Dissolved	mg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	mg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gases																										
Ethane	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethene	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methane	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Last Page.

Table 4
Off-Site Groundwater Analytical Results
Ford Livonia Transmission Plant
36200 Plymouth Road
Livonia, Michigan

Location:			MW-73S							MW-73SR				MW-74								
Screen Interval (ft. bgs):			7-12							2.5-12.5				14-19								
Date:	Unit	Residential Drinking Water Criteria	5/22/2017	7/26/2017	11/7/2017	2/6/2018	5/9/2018	8/10/2018	10/22/2018	12/17/2018	3/4/2019	5/8/2019	9/24/2019	5/23/2017	7/26/2017	11/7/2017	2/6/2018	5/9/2018	8/9/2018	10/22/2018	3/8/2019	5/17/2019	9/18/2019
Semi-volatile Organic Compounds (SVOCs)																						
1,4-Dioxane	µg/l	7.2	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	0.86 J	0.87 J	< 2.0	< 2.0	< 2.0	< 2.0	1.5 J	1.3 J	0.66 J	0.34 J	1.6 J	2.0	< 2.0	< 2.0	1.4 J
Volatile Organic Compounds (VOCs)																						
1,1-Dichloroethene	µg/l	7.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	µg/l	70	NA	1.9	1.8	1.3	1.3	1.5	1.7	2.3	2.1	1.8	3.0	NA	< 1.0	< 1.0	0.42 J	0.96 J	0.41 J	0.45 J	0.84 J	1.3	0.62 J
Tetrachloroethene	µg/l	5.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	µg/l	100	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.20 J	0.43 J	0.25 J	< 1.0	0.35 J	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1.0	0.40 J	0.48 J	0.48 J	0.33 J	0.38 J	0.51 J	0.46 J	0.29 J	0.23 J	< 1.0	0.34 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl chloride	µg/l	1.0	**1.6**	**1.3**	**1.9**	**1.1**	**1.2**	0.62 J	0.96 J	**1.7**	**1.5**	< 1.0	**1.3**	< 1.0	**2.7**	**2.4**	**2.0**	0.70 J	**2.8**	**2.2**	**1.1**	< 1.0	**1.7**
Metals																						
Iron, Dissolved	µg/l	300	**3,900**	NA	**1,200**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Total	µg/l	300	**3,900**	NA	**1,200**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	µg/l	50	**1,200**	NA	**940**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Total	µg/l	50	**1,200**	NA	**890**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anions																						
Nitrate-N	mg/l	10	< 1.0	NA	< 0.10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	mg/l	250	80	NA	89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (TOC)																						
Carbon, Dissolved	mg/l	NS	6.1	NA	4.8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	mg/l	NS	5.2	NA	4.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gases																						
Ethane	µg/l	NS	NA	NA	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethene	µg/l	NS	NA	NA	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methane	µg/l	NS	NA	NA	24	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Last Page.

Table 4
Off-Site Groundwater Analytical Results
Ford Livonia Transmission Plant
36200 Plymouth Road
Livonia, Michigan

Location:			MW-74S				MW-75D										MW-75S								
Screen Interval (ft. bgs):			3-13				12-17										5-10								
Date:	Unit	Residential Drinking Water Criteria	12/21/2018	3/8/2019	5/8/2019	9/18/2019	5/23/2017	7/26/2017	11/8/2017	2/6/2018	5/9/2018	8/9/2018	10/22/2018	3/7/2019	5/15/2019	9/18/2019	5/23/2017	7/26/2017	11/8/2017	2/6/2018	5/9/2018	8/9/2018	10/22/2018	12/18/2018	3/7/2019
Semi-volatile Organic Compounds (SVOCs)																									
1,4-Dioxane	µg/l	7.2	< 2.0	< 2.0	< 2.0	< 2.0	1.9 J	1.8 J	1.8 J	0.91 J	0.65 J	2.0	2.3	1.5 J	1.5 J	3.3	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Volatile Organic Compounds (VOCs)																									
1,1-Dichloroethene	µg/l	7.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	µg/l	70	1.3	0.82 J	0.97 J	1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	5.0	< 1.0	0.21 J	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	µg/l	100	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl chloride	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	**6.4**	**3.7**	**4.9 J**	**1.9**	**2.4**	**1.8**	**1.7**	**1.6**	**1.7**	**1.6**	0.45 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Metals																									
Iron, Dissolved	µg/l	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 100	NA	**330**	NA	NA	NA	NA	NA	NA
Iron, Total	µg/l	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	210	NA	**350**	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	µg/l	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**63**	NA	42	NA	NA	NA	NA	NA	NA
Manganese, Total	µg/l	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**70**	NA	42	NA	NA	NA	NA	NA	NA
Anions																									
Nitrate-N	mg/l	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**21**	NA	8.0 J	NA	NA	NA	NA	NA	NA
Sulfate	mg/l	250	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	89	NA	110	NA	NA	NA	NA	NA	NA
Total Organic Carbon (TOC)																									
Carbon, Dissolved	mg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.6	NA	13	NA	NA	NA	NA	NA	NA
Total Organic Carbon	mg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.6	NA	13	NA	NA	NA	NA	NA	NA
Gases																									
Ethane	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.95 J	NA	NA	NA	NA	NA	NA
Ethene	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	NA	NA	NA	NA	NA
Methane	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3,200	NA	NA	NA	NA	NA	NA

See Notes on Last Page.

Table 4
Off-Site Groundwater Analytical Results
Ford Livonia Transmission Plant
36200 Plymouth Road
Livonia, Michigan

Location:		Residential Drinking Water Criteria	MW-75SR				MW-76										MW-76S			
Screen Interval (ft. bgs):			2.5-12.5				15-20										4.5-14.5			
Date:	Unit		12/18/2019	3/7/2019	5/9/2019	9/18/2019	5/23/2017	7/26/2017	11/8/2017	2/6/2018	5/10/2018	8/9/2018	10/22/2018	12/21/2018	3/1/2019	5/17/2019	9/17/2019	12/21/2018	3/1/2019	5/8/2019	9/17/2019
Semi-volatile Organic Compounds (SVOCs)																					
1,4-Dioxane	µg/l	7.2	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	1.0 J	< 2.0	<2.0	< 2.0	< 2.0	<2.0	< 2.0	< 2.0	< 2.0
Volatile Organic Compounds (VOCs)																					
1,1-Dichloroethene	µg/l	7.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<1.0	< 1.0	< 1.0	<1.0	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	µg/l	70	< 1.0	< 1.0	< 1.0	< 1.0	NA	3.9	4.0	2.2	2.6	2.2	1.8	< 1.0	1.3	1.2	1.4	<1.0	<1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	5.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<1.0	< 1.0	< 1.0	<1.0	<1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	µg/l	100	< 1.0	< 1.0	< 1.0	< 1.0	NA	0.54 J	0.49 J	< 1.0	0.35 J	0.35 J	0.25 J	< 1.0	0.22 J	< 1.0	< 1.0	<1.0	<1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<1.0	< 1.0	< 1.0	<1.0	< 1.0	< 1.0	< 1.0
Vinyl chloride	µg/l	1.0	< 1.0	< 1.0	< 1.0	0.51 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<1.0	< 1.0	< 1.0	<1.0	<1.0	< 1.0	< 1.0
Metals																					
Iron, Dissolved	µg/l	300	NA	NA	NA	NA	**340**	NA	270	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Total	µg/l	300	NA	NA	NA	NA	**480**	NA	280	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	µg/l	50	NA	NA	NA	NA	**760**	NA	**760**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Total	µg/l	50	NA	NA	NA	NA	**800**	NA	**770**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anions																					
Nitrate-N	mg/l	10	NA	NA	NA	NA	1.2 J	NA	3.3 J	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	mg/l	250	NA	NA	NA	NA	120	NA	160	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (TOC)																					
Carbon, Dissolved	mg/l	NS	NA	NA	NA	NA	1.1	NA	4.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	mg/l	NS	NA	NA	NA	NA	0.90 J	NA	1.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gases																					
Ethane	µg/l	NS	NA	NA	NA	NA	NA	NA	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethene	µg/l	NS	NA	NA	NA	NA	NA	NA	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methane	µg/l	NS	NA	NA	NA	NA	NA	NA	1.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Last Page.

Table 4
Off-Site Groundwater Analytical Results
Ford Livonia Transmission Plant
36200 Plymouth Road
Livonia, Michigan

Location:			MW-77										MW-77S				MW-78										
Screen Interval (ft. bgs):			9-14										2.5-12.5				7-12										
Date:	Unit	Residential Drinking Water Criteria	5/25/2017	7/26/2017	11/10/2017	2/8/2018	5/11/2018	8/6/2018	10/23/2018	3/4/2019	5/16/2019	9/17/2019	12/27/2018	3/4/2019	5/16/2019	9/17/2019	5/25/2017	7/25/2017	11/9/2017	2/8/2018	5/8/2018	8/6/2018	10/22/2018	12/19/2018	2/26/2019	5/13/2019	9/19/2019
Semi-volatile Organic Compounds (SVOCs)																											
1,4-Dioxane	µg/l	7.2	NA	0.32 J	< 2.0	< 2.0	0.27 J	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	NA	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	0.90 J	< 2.0	< 2.0	< 2.0	< 2.0
Volatile Organic Compounds (VOCs)																											
1,1-Dichloroethene	µg/l	7.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	µg/l	70	NA	0.67 J	0.73 J	0.66 J	0.54 J	0.61 J	0.74 J	0.60 J	0.39 J	0.66 J	< 1.0	0.30 J	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	0.28 J	0.26 J	< 1.0	0.22 J	0.19 J	0.22 J
Tetrachloroethene	µg/l	5.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	µg/l	100	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1.0	0.87 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.17 J	< 1.0	< 1.0	< 1.0	0.22 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl chloride	µg/l	1.0	0.51 J	0.45 J	< 1.0	< 1.0	< 1.0	0.24 J	< 1.0	0.48 J	0.24 J	0.35 J	< 1.0	0.20 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Metals																											
Iron, Dissolved	µg/l	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Total	µg/l	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	µg/l	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Total	µg/l	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anions																											
Nitrate-N	mg/l	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	mg/l	250	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (TOC)																											
Carbon, Dissolved	mg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	mg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gases																											
Ethane	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethene	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methane	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Last Page.

Table 4
Off-Site Groundwater Analytical Results
Ford Livonia Transmission Plant
36200 Plymouth Road
Livonia, Michigan

Location:			MW-78S				MW-79D										MW-79S							MW-79SR			
Screen Interval (ft. bgs):			2.5-12.5				10-15										5-10							2.5-12.5			
Date:	Unit	Residential Drinking Water Criteria	12/19/2018	2/26/2019	5/13/2019	9/19/2019	5/24/2017	7/25/2017	11/9/2017	2/8/2018	5/8/2018	8/6/2018	10/24/2018	3/7/2019	5/15/2019	9/19/2019	5/24/2017	7/25/2017	11/9/2017	2/8/2018	5/8/2018	8/6/2018	10/30/2018	12/19/2018	3/1/2019	5/15/2019	9/18/2019
Semi-volatile Organic Compounds (SVOCs)																											
1,4-Dioxane	µg/l	7.2	<2.0	< 2.0	< 2.0	< 2.0	NA	< 2.0	< 2.0	< 2.0	0.49 J	0.87 J	0.95 J	< 2.0	0.99 J	< 2.0	NA	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	<2.0	< 2.0	< 2.0
Volatile Organic Compounds (VOCs)																											
1,1-Dichloroethene	µg/l	7.0	<1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	µg/l	70	<1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	5.0	<1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	µg/l	100	<1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	<1.0	< 1.0	< 1.0
Vinyl chloride	µg/l	1.0	<1.0	< 1.0	< 1.0	< 1.0	**3.2**	**4.1**	**3.6**	**1.9**	**3.5**	**2.8**	**1.3**	**1.6**	**2.6**	**1.5**	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.56 J	0.53 J	0.36 J	0.40 J
Metals																											
Iron, Dissolved	µg/l	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**990**	NA	**2,500**	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Total	µg/l	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1,100**	NA	**2,900**	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	µg/l	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**110**	NA	**200**	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Total	µg/l	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**120**	NA	**200**	NA	NA	NA	NA	NA	NA	NA	NA
Anions																											
Nitrate-N	mg/l	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.063 J	NA	< 0.10	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	mg/l	250	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	41	NA	69	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (TOC)																											
Carbon, Dissolved	mg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.1	NA	4.9	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	mg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.1	NA	4.4	NA	NA	NA	NA	NA	NA	NA	NA
Gases																											
Ethane	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA
Ethene	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA
Methane	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.6	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Last Page.

Table 4
Off-Site Groundwater Analytical Results
Ford Livonia Transmission Plant
36200 Plymouth Road
Livonia, Michigan

Location:			MW-80S							MW-80SR				MW-81									MW-81S			
Screen Interval (ft. bgs):			7-12							2.5-12.5				8-13									2.5-12.5			
Date:	Unit	Residential Drinking Water Criteria	5/24/2017	7/25/2017	11/8/2017	2/8/2018	5/8/2018	8/6/2018	10/22/2018	12/27/2018	3/6/2019	5/10/2019	9/23/2019	5/26/2017	7/25/2017	11/9/2017	2/6/2018	5/10/2018	8/9/2018	10/23/2018	3/6/2019	5/17/2019	9/19/2019	12/26/2018	3/6/2019	5/17/2019	9/19/2019
Semi-volatile Organic Compounds (SVOCs)																										
1,4-Dioxane	µg/l	7.2	NA	0.52 J	0.55 J	0.33 J	0.46 J	< 2.0	1.2 J	< 2.0	< 2.0	< 2.0	< 2.0	NA	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Volatile Organic Compounds (VOCs)																										
1,1-Dichloroethene	µg/l	7.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	µg/l	70	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.18 J	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	5.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	µg/l	100	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl chloride	µg/l	1.0	**4.6**	**7.1**	**7.6**	**2.9**	**6.3**	**6.2**	**4.1**	**1.4**	**2.1**	**3.2**	**3.4**	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.69 J	< 1.0	< 1.0	< 1.0	0.66 J	< 1.0	< 1.0
Metals																										
Iron, Dissolved	µg/l	300	**600**	NA	**3,600**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Total	µg/l	300	**530**	NA	**3,600**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	µg/l	50	**200**	NA	**230**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Total	µg/l	50	**190**	NA	**230**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anions																										
Nitrate-N	mg/l	10	< 0.10	NA	< 0.10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	mg/l	250	97	NA	110	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (TOC)																										
Carbon, Dissolved	mg/l	NS	5.6	NA	5.7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	mg/l	NS	4.5	NA	5.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gases																										
Ethane	µg/l	NS	NA	NA	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethene	µg/l	NS	NA	NA	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methane	µg/l	NS	NA	NA	55	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Last Page.

Table 4
Off-Site Groundwater Analytical Results
Ford Livonia Transmission Plant
36200 Plymouth Road
Livonia, Michigan

Location:		Residential Drinking Water Criteria	MW-82D										MW-82S							MW-82SR			
Screen Interval (ft. bgs):			18-23										9-14							5-15			
Date:	Unit		5/24/2017	7/25/2017	11/8/2017	2/6/2018	5/10/2018	8/8/2018	10/23/2018	3/6/2019	5/17/2019	9/23/2019	5/24/2017	7/25/2017	11/8/2017	2/6/2018	5/10/2018	8/8/2018	10/23/2018	12/26/2018	3/5/2019	5/17/2019	9/23/2019
Semi-volatile Organic Compounds (SVOCs)																							
1,4-Dioxane	µg/l	7.2	NA	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	NA	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Volatile Organic Compounds (VOCs)																							
1,1-Dichloroethene	µg/l	7.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	µg/l	70	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	5.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	µg/l	100	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.16 J	< 1.0	< 1.0
Vinyl chloride	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.78 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.27 J	< 1.0	< 1.0
Metals																							
Iron, Dissolved	µg/l	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	180	NA	**710**	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Total	µg/l	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**380**	NA	**720**	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	µg/l	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**510**	NA	**390**	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Total	µg/l	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**550**	NA	**380**	NA	NA	NA	NA	NA	NA	NA	NA
Anions																							
Nitrate-N	mg/l	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 0.10	NA	< 0.10	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	mg/l	250	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	**470**	NA	**270**	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (TOC)																							
Carbon, Dissolved	mg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.7	NA	4.8	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	mg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.1	NA	2.2	NA	NA	NA	NA	NA	NA	NA	NA
Gases																							
Ethane	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA
Ethene	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	< 1.0	NA	NA	NA	NA	NA	NA	NA	NA
Methane	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Last Page.

Table 4
Off-Site Groundwater Analytical Results
Ford Livonia Transmission Plant
36200 Plymouth Road
Livonia, Michigan

Location:		Residential Drinking Water Criteria	MW-83										MW-83S				MW-84									
Screen Interval (ft. bgs):			8-13										3-13				8-13									
Date:	Unit		5/26/2017	7/25/2017	11/9/2017	2/8/2018	5/11/2018	8/8/2018	10/22/2018	3/5/2019	5/22/2019	9/18/2019	12/26/2018	3/5/2019	5/22/2019	9/18/2019	5/25/2017	7/25/2017	11/9/2017	2/8/2018	5/8/2018	8/6/2018	10/23/2018	2/28/2019	5/21/2019	9/24/2019
Semi-volatile Organic Compounds (SVOCs)																										
1,4-Dioxane	µg/l	7.2	NA	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	0.92 J	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	NA	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	0.86 J	< 2.0	< 2.0	< 2.0
Volatile Organic Compounds (VOCs)																										
1,1-Dichloroethene	µg/l	7.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	µg/l	70	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	5.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	µg/l	100	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.17 J	< 1.0	< 1.0	0.23 J	0.20 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.14 J	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl chloride	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.27 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Metals																										
Iron, Dissolved	µg/l	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Total	µg/l	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	µg/l	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Total	µg/l	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anions																										
Nitrate-N	mg/l	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	mg/l	250	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (TOC)																										
Carbon, Dissolved	mg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	mg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gases																										
Ethane	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethene	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methane	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table 4
Off-Site Groundwater Analytical Results
Ford Livonia Transmission Plant
36200 Plymouth Road
Livonia, Michigan

Location:		Residential Drinking Water Criteria	MW-84S				MW-85										MW-85S	MW-85SR	
Screen Interval (ft. bgs):			2.5-12.5				8-13										2.5-12.5	4.5-9.5	
Date:	Unit		12/21/2018	2/28/2019	5/9/2019	9/24/2019	5/25/2017	7/25/2017	11/7/2017	2/8/2018	5/8/2018	8/8/2018	10/22/2018	2/26/2019	5/17/2019	9/17/2019	12/21/2018	4/12/2019	9/17/2019
Semi-volatile Organic Compounds (SVOCs)																			
1,4-Dioxane	µg/l	7.2	< 2.0	< 2.0	< 2.0	< 2.0	NA	0.29 J	< 2.0	0.41 J	0.45 J	< 2.0	1.0 J	< 2.0	1.3 J	< 2.0	1.1 J	< 2.0	< 2.0
Volatile Organic Compounds (VOCs)																			
1,1-Dichloroethene	µg/l	7.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	µg/l	70	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	5.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	µg/l	100	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1.0	< 1.0	< 1.0	< 1.0	0.17 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl chloride	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	**8.6**	**7.3**	**7.3**	**5.5**	**7.5**	**7.2**	**5.5**	**5.5**	**5.4**	**6.5**	**7.8**	**2.2**	**2.1**
Metals																			
Iron, Dissolved	µg/l	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Total	µg/l	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	µg/l	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Total	µg/l	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anions																			
Nitrate-N	mg/l	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	mg/l	250	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (TOC)																			
Carbon, Dissolved	mg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	mg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gases																			
Ethane	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethene	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methane	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

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Table 4
Off-Site Groundwater Analytical Results
Ford Livonia Transmission Plant
36200 Plymouth Road
Livonia, Michigan

Location:			MW-86										MW-86S				MW-87										
Screen Interval (ft. bgs):			12-17										2.5-12.5				14-19										
Date:	Unit	Residential Drinking Water Criteria	5/25/2017	7/26/2017	11/10/2017	2/8/2018	5/10/2018	8/6/2018	10/24/2018	2/28/2019	5/21/2019	9/19/2019	12/18/2018	2/28/2019	5/13/2019	9/19/2019	5/23/2017	7/26/2017	11/10/2017	2/8/2018	5/10/2018	8/6/2018	10/23/2018	12/21/2018	2/28/2019	5/21/2019	9/20/2019
Semi-volatile Organic Compounds (SVOCs)																											
1,4-Dioxane	µg/l	7.2	NA	0.99 J	0.87 J	< 2.0	1.2 J	< 2.0	1.4 J	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	NA	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	0.88 J	< 2.0	< 2.0	< 2.0	< 2.0
Volatile Organic Compounds (VOCs)																											
1,1-Dichloroethene	µg/l	7.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	µg/l	70	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	5.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	µg/l	100	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	NA	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl chloride	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Metals																											
Iron, Dissolved	µg/l	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Total	µg/l	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	µg/l	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Total	µg/l	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anions																											
Nitrate-N	mg/l	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	mg/l	250	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (TOC)																											
Carbon, Dissolved	mg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	mg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gases																											
Ethane	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethene	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methane	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Last Page.

Table 4
Off-Site Groundwater Analytical Results
Ford Livonia Transmission Plant
36200 Plymouth Road
Livonia, Michigan

Location: / Screen Interval (ft. bgs): / Date:	Unit	Residential Drinking Water Criteria	MW-87S 4.5-14.5				MW-96S 2.5-12.5				MW-97S 2.5-12.5				MW-98S 2.5-12.5				MW-99S 3-13				MW-100S 3-13			
			12/21/2018	3/1/2019	5/13/2019	9/20/2019	12/18/2018	2/27/2019	5/16/2019	9/20/2019	12/27/2018	3/6/2019	5/10/2019	9/19/2019	12/19/2018	3/6/2019	5/10/2019	9/20/2019	12/21/2018	3/7/2019	5/9/2019	9/16/2019	12/18/2018	2/27/2019	5/9/2019	9/16/2019
Semi-volatile Organic Compounds (SVOCs)																										
1,4-Dioxane	µg/l	7.2	<2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	1.0 J	< 2.0	< 2.0	< 2.0
Volatile Organic Compounds (VOCs)																										
1,1-Dichloroethene	µg/l	7.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	µg/l	70	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.21 J	0.94 J	0.57 J	0.89 J	0.30 J	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	5.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	µg/l	100	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl chloride	µg/l	1.0	<1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.42 J	< 1.0	< 1.0	< 1.0	0.43 J	< 1.0	< 1.0	< 1.0	0.28 J	< 1.0	< 1.0	0.22 J	< 1.0	< 1.0	< 1.0
Metals																										
Iron, Dissolved	µg/l	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Total	µg/l	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	µg/l	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Total	µg/l	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anions																										
Nitrate-N	mg/l	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	mg/l	250	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (TOC)																										
Carbon, Dissolved	mg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	mg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gases																										
Ethane	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethene	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methane	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Last Page.

Table 4
Off-Site Groundwater Analytical Results
Ford Livonia Transmission Plant
36200 Plymouth Road
Livonia, Michigan

Location:		Residential Drinking Water Criteria	MW-101S				MW-102				MW-102S				MW-105S				MW-106S				MW-107S			
Screen Interval (ft. bgs):			4.5-14.5				10-15				2.5-12.5				2.5-12.5				2.5-12.5				2.5-12.5			
Date:	Unit		12/21/2018	3/6/2019	5/8/2019	9/16/2019	12/19/2018	2/25/2019	5/17/2019	9/18/2019	12/19/2018	2/25/2019	5/14/2019	9/18/2019	12/26/2018	2/25/2019	5/14/2019	9/16/2019	12/19/2018	2/27/2019	5/16/2019	9/23/2019	12/26/2018	2/27/2019	5/10/2019	9/24/2019
Semi-volatile Organic Compounds (SVOCs)																										
1,4-Dioxane	µg/l	7.2	< 2.0	< 2.0	< 2.0	< 2.0	1.7 J	1.3 J	1.1 J	1.0 J	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Volatile Organic Compounds (VOCs)																										
1,1-Dichloroethene	µg/l	7.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	µg/l	70	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	µg/l	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl chloride	µg/l	1.0	< 1.0	0.58 J	< 1.0	< 1.0	**1.6**	**1.7**	**1.8**	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Metals																										
Iron, Dissolved	µg/l	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Total	µg/l	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	µg/l	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Total	µg/l	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anions																										
Nitrate-N	mg/l	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	mg/l	250	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (TOC)																										
Carbon, Dissolved	mg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	mg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gases																										
Ethane	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethene	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methane	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Last Page.

Table 4
Off-Site Groundwater Analytical Results
Ford Livonia Transmission Plant
36200 Plymouth Road
Livonia, Michigan

Location:		Residential Drinking Water Criteria	MW-108S				MW-131S				MW-132S				MW-133S			MW-134S			MW-135S			MW-136S		
Screen Interval (ft. bgs):			2.5-12.5				2.5-12.5				2.5-12.5				4-9			5-10			5-10			2-7		
Date:	Unit		12/26/2018	2/25/2019	5/14/2019	9/19/2019	12/26/2018	2/26/2019	5/14/2019	9/16/2019	12/26/2018	2/26/2019	5/14/2019	9/16/2019	2/14/2019	5/23/2019	9/17/2019	2/14/2019	5/20/2019	9/17/2019	2/14/2019	5/20/2019	9/16/2019	2/19/2019	5/22/2019	9/18/2019
Semi-volatile Organic Compounds (SVOCs)																										
1,4-Dioxane	µg/l	7.2	0.90 J	NS	0.93 J	< 2.0	1.0 J	< 2.0	1.3 J	1.3 J	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Volatile Organic Compounds (VOCs)																										
1,1-Dichloroethene	µg/l	7.0	< 1.0	NS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	µg/l	70	< 1.0	NS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	5.0	< 1.0	NS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	µg/l	100	< 1.0	NS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1.0	< 1.0	NS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl chloride	µg/l	1.0	< 1.0	NS	< 1.0	< 1.0	0.98 J	0.69 J	0.85 J	0.87 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.96 J
Metals																										
Iron, Dissolved	µg/l	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Total	µg/l	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	µg/l	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Total	µg/l	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anions																										
Nitrate-N	mg/l	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	mg/l	250	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (TOC)																										
Carbon, Dissolved	mg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	mg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gases																										
Ethane	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethene	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methane	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Last Page.

Table 4
Off-Site Groundwater Analytical Results
Ford Livonia Transmission Plant
36200 Plymouth Road
Livonia, Michigan

Location:			MW-137S			MW-138S			MW-139S			MW-140S			MW-141S			MW-142S			MW-192S	
Screen Interval (ft. bgs):			2-7			2-7			2-7			2-7			3-8			2.5-7.5			2.5-7.5	
Date:	Unit	Residential Drinking Water Criteria	2/23/2019	5/13/2019	9/23/2019	2/19/2019	5/16/2019	9/23/2019	2/26/2019	5/9/2019	9/20/2019	2/26/2019	5/16/2019	9/18/2019	2/27/2019	5/15/2019	9/18/2019	2/25/2019	5/23/2019	9/16/2019	4/11/2019	9/20/2019
Semi-volatile Organic Compounds (SVOCs)																						
1,4-Dioxane	µg/l	7.2	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Volatile Organic Compounds (VOCs)																						
1,1-Dichloroethene	µg/l	7.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	µg/l	70	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.34 J
Tetrachloroethene	µg/l	5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	µg/l	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl chloride	µg/l	1.0	< 1.0	0.91 J	**1.1**	**1.7**	**1.6**	**1.4**	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Metals																						
Iron, Dissolved	µg/l	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Iron, Total	µg/l	300	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Dissolved	µg/l	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Manganese, Total	µg/l	50	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anions																						
Nitrate-N	mg/l	10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Sulfate	mg/l	250	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon (TOC)																						
Carbon, Dissolved	mg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Total Organic Carbon	mg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Gases																						
Ethane	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Ethene	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Methane	µg/l	NS	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

See Notes on Last Page.

Table 4
Off-Site Groundwater Analytical Results
Ford Livonia Transmission Plant
36200 Plymouth Road
Livonia, Michigan

Notes:
All results are compared to the MDEQ Part 201 Generic Cleanup Criteria, December 31, 2013.
Bolded Result exceeds residential Drinking Water criteria
< Result not detected above reporting limit.

Footnote:
* Residential Drinking Water Criteria for 1,4-dioxane is derived from the MDEQ Proposed Rule Changes (September 2016) and Emergency Rules (October 27, 2016).
** Groundwater results for Trichloroethene and Vinyl Chloride are compared to the published MDEQ Remediation and Redevelopment Division Target Detection Limit of 1.0 µg/l.

Abbreviations:
EGLE Michigan Department of Environment, Great Lakes, and Energy
ft. bgs feet below ground surface
J estimated result
MDEQ Michigan Department of Environmental Quality
mg/l milligrams per liter
NA not analyzed
NS no standard / not sampled
µg/l micrograms per liter

Analytical Methods:
8260B
8260 SIM

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Appendix A – Summary of 1Q 2019 Off-Site Shallow Groundwater Sampling Results
Ford Livonia Transmission Plant

					Location:	MW-72	MW-72	MW-72	MW-72	MW-72S	MW-73D	MW-73D	MW-73D	MW-73D	MW-73S	MW-73S	MW-73S	MW-73S	MW-73SR
					Date:	2/6/2018	5/9/2018	8/10/2018	10/22/2018	12/17/2018	2/6/2018	5/9/2018	8/10/2018	10/22/2018	2/6/2018	5/9/2018	8/10/2018	10/22/2018	12/17/2018
					Sample Name:	MW-72-020618	MW-72_050818	MW-72_081018	MW-72_102218	MW-72S-121718	MW-73D-020618	MW-73D_050918	MW-73D_081018	MW-73D_102218	MW-73S-020618	MW-73S_050818	MW-73S_081018	MW-73S_102218	MW-73SR-121718
					Screen Interval (ft. bgs):	15-20	15-20	15-20	15-20	3-13	13.5-18.5	13.5-18.5	13.5-18.5	13.5-18.5	7-12	7-12	7-12	7-12	2.5-12.5
					Lab SDG #:	91361-1	95403-1	99859-1	103231-1	106083-1	91361-1	95547-1	99859-1	103231-1	91361-1	95403-1	99859-1	103231-1	106083-1
analytic_method	chemical_name	fraction	cas_rn	Ford_LTP_ Offsite Res DW	MI GW (DEQ2018) NON-RES DW														
SW8468260BBYSIM	1,4-Dioxane	T	123-91-1	7.2	350	0.78 J	0.32 J	1.1 J	1.4 J	< 2.0	1.5 J	3.0	1.9 J	3.8	< 2.0	< 2.0	< 2.0	0.86 J	0.87 J
SW8260B	1,1-Dichloroethene	T	75-35-4	7.0	7	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	T	156-59-2	70	70	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.43 J	0.35 J	0.56 J	0.19 J	1.3	1.3	1.5	1.7	2.3
SW8260B	Tetrachloroethene	T	127-18-4	5.0	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	T	156-60-5	100	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.20 J	0.43 J
SW8260B	Trichloroethene	T	79-01-6	1.0	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.33 J	0.38 J	0.51 J	0.46 J	0.29 J
SW8260B	Vinyl chloride	T	75-01-4	1.0	2	1.3	1.5 J	1.2	1.1	< 1.0	0.79 J	0.80 J	0.75 J	< 1.0	1.1	1.2	0.62 J	0.96 J	1.7

					Location:	MW-74	MW-74	MW-74	MW-74	MW-74S	MW-75D	MW-75D	MW-75D	MW-75D	MW-75S	MW-75S	MW-75S	MW-75S	MW-75SR
					Date:	2/6/2018	5/9/2018	8/9/2018	10/22/2018	12/21/2018	2/6/2018	5/9/2018	8/9/2018	10/22/2018	2/6/2018	5/9/2018	8/9/2018	10/22/2018	12/18/2018
					Sample Name:	MW-74-020618	MW-74_050918	MW-74_080918	MW-74_102218	MW-74S-122118	MW-75D-020618	MW-75D_050918	MW-75D_080918	MW-75D_102218	MW-75S-020618	MW-75S_050918	MW-75S_080918	MW-75S_102218	MW-75 SR-121818
					Screen Interval (ft. bgs):	14-19	14-19	14-19	14-19	3-13	12-17	12-17	12-17	12-17	5-10	5-10	5-10	5-10	2.5-12.5
					Lab SDG #:	91361-1	95547-1	99859-1	103231-1	106317-1	91361-1	95547-1	99859-1	103231-1	91361-1	95547-1	99859-1	103231-1	106083-2
analytic_method	chemical_name	fraction	cas_rn	Ford_LTP_ Offsite Res DW	MI GW (DEQ2018) NON-RES DW														
SW8468260BBYSIM	1,4-Dioxane	T	123-91-1	7.2	350	0.66 J	0.34 J	1.6 J	2.0	< 2.0	0.91 J	0.65 J	2.0	2.3	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
SW8260B	1,1-Dichloroethene	T	75-35-4	7.0	7	< 1.0	< 1.0 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 J	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	T	156-59-2	70	70	0.42 J	0.96 J	0.41 J	0.45 J	1.3	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 J	< 1.0	< 1.0	< 1.0
SW8260B	Tetrachloroethene	T	127-18-4	5.0	5	< 1.0	< 1.0 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 J	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	T	156-60-5	100	100	< 1.0	< 1.0 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 J	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	T	79-01-6	1.0	5	< 1.0	< 1.0 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 J	< 1.0	< 1.0	< 1.0
SW8260B	Vinyl chloride	T	75-01-4	1.0	2	2.0	0.70 J	2.8	2.2	< 1.0	1.9	2.4	1.8	1.7	< 1.0	< 1.0 J	< 1.0	< 1.0	< 1.0

					Location:	MW-76	MW-76	MW-76	MW-76	MW-76S	MW-77	MW-77	MW-77	MW-77	MW-77S	MW-78	MW-78	MW-78	MW-78
					Date:	2/6/2018	5/10/2018	8/9/2018	10/22/2018	12/21/2018	2/8/2018	5/11/2018	8/6/2018	10/23/2018	12/27/2018	2/8/2018	5/8/2018	8/6/2018	10/22/2018
					Sample Name:	MW-76-020618	MW-76_051018	MW-76_080918	MW-76_102218	MW-76S-MS/MSD-122118	MW-77_020818	MW-77_051118	MW-77_080618	MW-77_102318	MW-77S_122718	MW-78_020818	MW-78_050818	MW-78_080618	MW-78_102218
					Screen Interval (ft. bgs):	15-20	15-20	15-20	15-20	4.5-14.5	9-14	9-14	9-14	9-14	2.5-12.5	7-12	7-12	7-12	7-12
					Lab SDG #:	91361-1	95547-1	99859-1	103231-1	106318-1	91428-1	95547-1	99575-1	103472-1	106464-1	91428-1	95403-1	99575-1	103230-1
analytic_method	chemical_name	fraction	cas_rn	Ford_LTP_ Offsite Res DW	MI GW (DEQ2018) NON-RES DW														
SW8468260BBYSIM	1,4-Dioxane	T	123-91-1	7.2	350	< 2.0	< 2.0	< 2.0	1.0 J	< 2.0	< 2.0	0.27 J	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	0.90 J
SW8260B	1,1-Dichloroethene	T	75-35-4	7.0	7	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	T	156-59-2	70	70	2.2	2.6	2.2	1.8	< 1.0	0.66 J	0.54 J	0.61 J	0.74 J	< 1.0	< 1.0	< 1.0	0.28 J	0.26 J
SW8260B	Tetrachloroethene	T	127-18-4	5.0	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	T	156-60-5	100	100	< 1.0	0.35 J	0.35 J	0.25 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	T	79-01-6	1.0	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Vinyl chloride	T	75-01-4	1.0	2	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.24 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Notes:
All units are measured in micrograms per liter.

Abbreviations:

ft bgs	Feet below ground surface
J	Estimated value
<	Less than

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Appendix A – Summary of 1Q 2019 Off-Site Shallow Groundwater Sampling Results
Ford Livonia Transmission Plant

					Location:	MW-78S	MW-79D	MW-79D	MW-79D	MW-79D	MW-79S	MW-79S	MW-79S	MW-79S	MW-79SR	MW-80S	MW-80S	MW-80S	MW-80S
					Date:	12/19/2018	2/8/2018	5/8/2018	8/6/2018	10/24/2018	2/8/2018	5/8/2018	8/6/2018	10/30/2018	12/19/2018	2/8/2018	5/8/2018	8/6/2018	10/22/2018
					Sample Name:	MW-78S_121918	MW-79D_020818	MW-79D_050818	MW-79D_080618	MW-79_102418	MW-79S_020818	MW-79S_050818	MW-79S_080618	MW-79S_103018	MW-79SR-121918	MW-80S_020818	MW-80S_050818	MW-80S_080618	MW-80S_102218
					Screen Interval (ft. bgs):	2.5-12.5	10-15	10-15	10-15	10-15	5-10	5-10	5-10	5-10	2.5-12.5	7-12	7-12	7-12	7-12
					Lab SDG #:	106260-1	91428-1	95403-1	99575-1	103472-1	91428-1	95403-1	99575-1	103818-1	106257-1	91428-1	95403-1	99575-1	103230-1
analytic_method	chemical_name	fraction	cas_rn	Ford_LTP_Offsite Res DW	MI GW (DEQ2018) NON-RES DW														
SW8468260BBYSIM	1,4-Dioxane	T	123-91-1	7.2	350	< 2.0	< 2.0	0.49 J	0.87 J	0.95 J	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	0.33 J	0.46 J	< 2.0	1.2 J
SW8260B	1,1-Dichloroethene	T	75-35-4	7.0	7	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	T	156-59-2	70	70	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Tetrachloroethene	T	127-18-4	5.0	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	T	156-60-5	100	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	T	79-01-6	1.0	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Vinyl chloride	T	75-01-4	1.0	2	< 1.0	1.9	3.5	2.8	1.3	< 1.0	< 1.0	< 1.0	< 1.0	0.56 J	2.9	6.3	6.2	4.1

					Location:	MW-80SR	MW-81	MW-81	MW-81	MW-81	MW-81S	MW-82D	MW-82D	MW-82D	MW-82D	MW-82S	MW-82S	MW-82S	MW-82S
					Date:	12/27/2018	2/6/2018	5/10/2018	8/9/2018	10/23/2018	12/26/2018	2/6/2018	5/10/2018	8/8/2018	10/23/2018	2/6/2018	5/10/2018	8/8/2018	10/23/2018
					Sample Name:	MW-80SR_122718	MW-81-020618	MW-81_051018	MW-81_080918	MW-81_102318	MW-81S_122618	MW-82D-020618	MW-82D_051018	MW-82D-080818	MW-82D_102318	MW-82S-020618	MW-82S_051018	MW-82S-080818	MW-82S_102318
					Screen Interval (ft. bgs):	2.5-12.5	8-13	8-13	8-13	8-13	2.5-12.5	18-23	18-23	18-23	18-23	9-14	9-14	9-14	9-14
					Lab SDG #:	106467-1	91361-1	95547-1	99859-1	103472-1	106456-1	91361-1	95547-1	99733-1	103472-1	91361-1	95547-1	99733-1	103472-1
analytic_method	chemical_name	fraction	cas_rn	Ford_LTP_Offsite Res DW	MI GW (DEQ2018) NON-RES DW														
SW8468260BBYSIM	1,4-Dioxane	T	123-91-1	7.2	350	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
SW8260B	1,1-Dichloroethene	T	75-35-4	7.0	7	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	T	156-59-2	70	70	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Tetrachloroethene	T	127-18-4	5.0	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	T	156-60-5	100	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	T	79-01-6	1.0	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Vinyl chloride	T	75-01-4	1.0	2	1.4	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

					Location:	MW-82SR	MW-83	MW-83	MW-83	MW-83	MW-83S	MW-84	MW-84	MW-84	MW-84	MW-84S	MW-85	MW-85	MW-85
					Date:	12/26/2018	2/8/2018	5/11/2018	8/8/2018	10/22/2018	12/26/2018	2/8/2018	5/8/2018	8/6/2018	10/23/2018	12/21/2018	2/8/2018	5/8/2018	8/8/2018
					Sample Name:	MW-82SR_122618	MW-83_020818	MW-83_051118	MW-83-080818	MW-83_102218	MW-83S-MS/MSD_122618	MW-84_020818	MW-84_050818	MW-84_080618	MW-84_102318	MW-84S-122118	MW-85_020818	MW-85_050818	MW-85-080818
					Screen Interval (ft. bgs):	5-15	8-13	8-13	8-13	8-13	3-13	8-13	8-13	8-13	8-13	2.5-12.5	8-13	8-13	8-13
					Lab SDG #:	106456-1	91428-1	95547-1	99733-1	103230-1	106456-1	91428-1	95403-1	99575-1	103472-1	106318-1	91428-1	95403-1	99733-1
analytic_method	chemical_name	fraction	cas_rn	Ford_LTP_Offsite Res DW	MI GW (DEQ2018) NON-RES DW														
SW8468260BBYSIM	1,4-Dioxane	T	123-91-1	7.2	350	< 2.0	< 2.0	< 2.0	< 2.0	0.92 J	< 2.0	< 2.0	< 2.0	< 2.0	0.86 J	< 2.0	0.41 J	0.45 J	< 2.0
SW8260B	1,1-Dichloroethene	T	75-35-4	7.0	7	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	T	156-59-2	70	70	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Tetrachloroethene	T	127-18-4	5.0	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	T	156-60-5	100	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	T	79-01-6	1.0	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.23 J	< 1.0	< 1.0	0.14 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Vinyl chloride	T	75-01-4	1.0	2	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	5.5	7.5	7.2

Notes:
All units are measured in micrograms per liter.

Abbreviations:

ft bgs	Feet below ground surface
J	Estimated value
<	Less than

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Appendix A – Summary of 1Q 2019 Off-Site Shallow Groundwater Sampling Results
Ford Livonia Transmission Plant

					Location:	MW-85	MW-85S	MW-86	MW-86	MW-86	MW-86	MW-86S	MW-87	MW-87	MW-87	MW-87	MW-87S	MW-88S	MW-89S
					Date:	10/22/2018	12/21/2018	2/8/2018	5/10/2018	8/6/2018	10/24/2018	12/18/2018	2/8/2018	5/10/2018	8/6/2018	10/23/2018	12/21/2018	12/17/2018	12/19/2018
					Sample Name:	MW-85_102218	MW-85S-122118	MW-86_020818	MW-86_051018	MW-86_080618	MW-86_102418	MW-86S-121818	MW-87_020818	MW-87_051018	MW-87_080618	MW-87_102318	MW-87S-122118	MW-88S-121718	MW-89S-121918
					Screen Interval (ft. bgs):	8-13	2.5-12.5	12-17	12-17	12-17	12-17	2.5-12.5	14-19	14-19	14-19	14-19	4.5-14.5	3-13	3-13
					Lab SDG #:	103230-1	106318-1	91428-1	95547-1	99575-1	103472-1	106083-2	91428-1	95547-1	99575-1	103472-1	106317-1	106083-1	106257-1
analytic_method	chemical_name	fraction	cas_rn	Ford_LTP_ Offsite Res DW	MI GW (DEQ2018) NON-RES DW														
SW8468260BBYSIM	1,4-Dioxane	T	123-91-1	7.2	350	1.0 J	1.1 J	< 2.0	1.2 J	< 2.0	1.4 J	< 2.0	< 2.0	< 2.0	< 2.0	0.88 J	< 2.0	< 2.0	< 2.0
SW8260B	1,1-Dichloroethene	T	75-35-4	7.0	7	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	T	156-59-2	70	70	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.2
SW8260B	Tetrachloroethene	T	127-18-4	5.0	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	T	156-60-5	100	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	T	79-01-6	1.0	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Vinyl chloride	T	75-01-4	1.0	2	5.5	7.8	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

					Location:	MW-90S	MW-91S	MW-92S	MW-93S	MW-94S	MW-94S	MW-95S	MW-96S	MW-97S	MW-98S	MW-99S	MW-100S	MW-101S	MW-102
					Date:	12/27/2018	12/28/2018	12/19/2018	12/17/2018	12/21/2018	12/21/2018	12/19/2018	12/18/2018	12/27/2018	12/19/2018	12/21/2018	12/18/2018	12/21/2018	12/19/2018
					Sample Name:	MW-90S_122718	MW-91S_122818	MW-92S-121918	MW-93S-121718	MW-94S-122118	DUP-02-122118	MW-95S-121918	MW-96S-121818	MW-97S_122718	MW-98S_121918	MW-99S-122118	MW-100S-121818	MW-101S-122118	MW-102_121918
					Screen Interval (ft. bgs):	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	3-13	3-13	4.5-14.5	10-15
					Lab SDG #:	106467-1	106462-1	106257-1	106083-1	106317-1	106317-1	106257-1	106083-2	106464-1	106260-1	106317-1	106083-2	106318-1	106260-1
analytic_method	chemical_name	fraction	cas_rn	Ford_LTP_ Offsite Res DW	MI GW (DEQ2018) NON-RES DW														
SW8468260BBYSIM	1,4-Dioxane	T	123-91-1	7.2	350	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	1.0 J	< 2.0	1.7 J
SW8260B	1,1-Dichloroethene	T	75-35-4	7.0	7	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	T	156-59-2	70	70	< 1.0	< 1.0	< 1.0	< 1.0	0.16 J	0.18 J	< 1.0	< 1.0	< 1.0	< 1.0	0.94 J	< 1.0	< 1.0	< 1.0
SW8260B	Tetrachloroethene	T	127-18-4	5.0	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	T	156-60-5	100	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	T	79-01-6	1.0	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Vinyl chloride	T	75-01-4	1.0	2	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.1	< 1.0	< 1.0	< 1.0	< 1.0	0.22 J	< 1.0	1.6

					Location:	MW-102	MW-102S	MW-102S	MW-103S	MW-104S	MW-105S	MW-105S	MW-106S	MW-107S	MW-108S	MW-109S	MW-110S	MW-111S	MW-112S
					Date:	2/25/2019	12/19/2018	2/25/2019	2/5/2019	2/5/2019	12/26/2018	2/25/2019	12/19/2018	12/26/2018	12/26/2018	12/28/2018	2/5/2019	2/4/2019	12/28/2018
					Sample Name:	MW-102_022519	MW-102S_121918	MW-102S_022519	MW-103S-020519	MW-104S-020519	MW-105S_122618	MW-105S_022519	MW-106S_121918	MW-107S_122618	MW-108S_122618	MW-109S_122818	MW-110S-020519	MW-111S_020419	MW-112S_122818
					Screen Interval (ft. bgs):	10-15	2.5-12.5	2.5-12.5	2-7	9-14	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	8-13	8-13	2.5-12.5
					Lab SDG #:	108565-1	106260-1	108565-1	107779-1	107781-1	106468-1	108565-1	106260-1	106456-1	106468-1	106461-1	107782-1	107780-1	106461-1
analytic_method	chemical_name	fraction	cas_rn	Ford_LTP_ Offsite Res DW	MI GW (DEQ2018) NON-RES DW														
SW8468260BBYSIM	1,4-Dioxane	T	123-91-1	7.2	350	1.3 J	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	0.90 J	< 2.0	< 2.0	< 2.0	< 2.0
SW8260B	1,1-Dichloroethene	T	75-35-4	7.0	7	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	T	156-59-2	70	70	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.45 J	< 1.0	< 1.0	< 1.0
SW8260B	Tetrachloroethene	T	127-18-4	5.0	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	T	156-60-5	100	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.25 J	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	T	79-01-6	1.0	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Vinyl chloride	T	75-01-4	1.0	2	1.7	< 1.0	< 1.0	0.58 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.28 J	< 1.0	< 1.0	< 1.0

Notes:
All units are measured in micrograms per liter.

Abbreviations:

ft bgs	Feet below ground surface
J	Estimated value
<	Less than

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Appendix A – Summary of 1Q 2019 Off-Site Shallow Groundwater Sampling Results
Ford Livonia Transmission Plant

					Location:	MW-115S	MW-116S	MW-117S	MW-118S	MW-118S	MW-119S	MW-121S	MW-123S	MW-123S	MW-126S	MW-127S	MW-128S	MW-128S	MW-130S
					Date:	12/26/2018	12/26/2018	12/26/2018	12/27/2018	12/27/2018	12/27/2018	12/27/2018	12/28/2018	12/28/2018	12/27/2018	12/28/2018	12/27/2018	12/27/2018	12/28/2018
					Sample Name:	MW-115S_122618	MW-116S_122618	MW-117S_122618	MW-118S_122718	DUP-04_122718	MW-119S_122718	MW-121S_122718	MW-123S_122818	DUP-05_122818	MW-126S_122718	MW-127S_122818	MW-128S_122718	DUP-03_122718	MW-130S_122818
					Screen Interval (ft. bgs):	2.5-12.5	3-13	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	3-13	3-13	4-14	4-14	3-13
					Lab SDG #:	106465-1	106465-1	106465-1	106466-1	106466-1	106466-1	106466-1	106463-1	106463-1	106464-1	106462-1	106467-1	106467-1	106463-1
analytic_method	chemical_name	fraction	cas_rn	Ford_LTP_ Offsite Res DW	MI GW (DEQ2018) NON-RES DW														
SW8468260BBYSIM	1,4-Dioxane	T	123-91-1	7.2	350	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
SW8260B	1,1-Dichloroethene	T	75-35-4	7.0	7	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	T	156-59-2	70	70	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.19 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Tetrachloroethene	T	127-18-4	5.0	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	T	156-60-5	100	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	T	79-01-6	1.0	5	< 1.0	< 1.0	0.29 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Vinyl chloride	T	75-01-4	1.0	2	2.7	< 1.0	0.92 J	0.68 J	0.74 J	< 1.0	< 1.0	4.6	3.2	< 1.0	1.5	< 1.0	< 1.0	1.1

					Location:	MW-131S	MW-132S	MW-133S	MW-134S	MW-135S	MW-136S	MW-137S	MW-138S	MW-139S	MW-140S	MW-141S	MW-142S	MW-143S	MW-145S
					Date:	12/26/2018	12/26/2018	2/14/2019	2/14/2019	2/14/2019	2/19/2019	2/23/2019	2/19/2019	2/26/2019	2/26/2019	2/27/2019	2/25/2019	2/20/2019	2/20/2019
					Sample Name:	MW-131S_122618	MW-132S_122618	MW-133S_021419	MW-134S_021419	MW-135S_021419	MW-136S_021919	MW-137S-022319	MW-138S-021919	MW-139S-022619	MW-140S-022619	MW-141S_022719	MW-142S_022519	MW-143S-022019	MW-145S-022019
					Screen Interval (ft. bgs):	2.5-12.5	2.5-12.5	4-9	5-10	5-10	2-7	2-7	2-7	2-7	2-7	3-8	2.5-7.5	5.5-10.5	6-11
					Lab SDG #:	106468-1	106468-1	108101-1	108101-1	108101-1	108389-1	108500-1	108384-1	108628-1	108630-1	108722-1	108560-1	108383-1	108385-1
analytic_method	chemical_name	fraction	cas_rn	Ford_LTP_ Offsite Res DW	MI GW (DEQ2018) NON-RES DW														
SW8468260BBYSIM	1,4-Dioxane	T	123-91-1	7.2	350	1.0 J	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
SW8260B	1,1-Dichloroethene	T	75-35-4	7.0	7	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	T	156-59-2	70	70	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Tetrachloroethene	T	127-18-4	5.0	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	T	156-60-5	100	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	T	79-01-6	1.0	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Vinyl chloride	T	75-01-4	1.0	2	0.98 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.7	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

					Location:	MW-146S	MW-147S	MW-148S	MW-149S	MW-150S	MW-151S	MW-152S	MW-153S	MW-154S	MW-155S	MW-155S	MW-156S	MW-158S	MW-159S
					Date:	2/20/2019	2/20/2019	2/23/2019	2/21/2019	2/25/2019	2/23/2019	2/21/2019	2/21/2019	2/21/2019	2/26/2019	2/26/2019	2/27/2019	2/22/2019	2/22/2019
					Sample Name:	MW-146S-022019	MW-147S-022019	MW-148S-022319	MW-149S-022119	MW-150S_022519	MW-151S-022319	MW-152S-022119	MW-153S-022119	MW-154S-022119	MW-155S-022619	DUP-03-022619	MW-156S_022719	MW-158S-022219	MW-159S-022219
					Screen Interval (ft. bgs):	6-11	2-7	2-7	2-7	2-7	2.5-7.5	2.5-7.5	2-7	2-7	2-7	2-7	3-8	2.5-7.5	4-9
					Lab SDG #:	108387-1	108386-1	108504-1	108469-1	108559-1	108502-1	108464-1	108463-1	108462-1	108631-1	108631-1	108723-1	108465-1	108467-1
analytic_method	chemical_name	fraction	cas_rn	Ford_LTP_ Offsite Res DW	MI GW (DEQ2018) NON-RES DW														
SW8468260BBYSIM	1,4-Dioxane	T	123-91-1	7.2	350	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
SW8260B	1,1-Dichloroethene	T	75-35-4	7.0	7	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	T	156-59-2	70	70	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Tetrachloroethene	T	127-18-4	5.0	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	T	156-60-5	100	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	T	79-01-6	1.0	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Vinyl chloride	T	75-01-4	1.0	2	0.23 J	0.38 J	0.94 J	1.4	0.46 J	1.2	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Notes:
All units are measured in micrograms per liter.

Abbreviations:

ft bgs	Feet below ground surface
J	Estimated value
<	Less than

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Appendix A – Summary of 1Q 2019 Off-Site Shallow Groundwater Sampling Results
Ford Livonia Transmission Plant

					Location:	MW-160S	MW-161S	MW-162S	MW-163S	MW-163S	MW-164S	MW-167S	MW-168S
					Date:	2/27/2019	2/27/2019	2/28/2019	2/28/2019	2/28/2019	2/22/2019	2/25/2019	2/25/2019
					Sample Name:	MW-160S_022719	MW-161S_022719	MW-162S-022819	MW-163S-022819	DUP-04-022819	MW-164S-022219	MW-167S_022519	MW-168S_022519
					Screen Interval (ft. bgs):	4-9	2.5-7.5	3-8	2-7	2-7	3-8	5-10	2-7
					Lab SDG #:	108721-1	108720-1	108810-1	108808-1	108808-1	108468-1	108557-1	108561-1
analytic_method	chemical_name	fraction	cas_rn	Ford_LTP_Offsite Res DW	MI GW (DEQ2018) NON-RES DW								
SW8468260BBYSIM	1,4-Dioxane	T	123-91-1	7.2	350	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
SW8260B	1,1-Dichloroethene	T	75-35-4	7.0	7	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	T	156-59-2	70	70	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Tetrachloroethene	T	127-18-4	5.0	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	T	156-60-5	100	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0 J
SW8260B	Trichloroethene	T	79-01-6	1.0	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Vinyl chloride	T	75-01-4	1.0	2	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

					Location:	MW-169S	MW-170S	MW-171S	MW-172S	MW-173S	MW-174S	MW-175S	MW-176S
					Date:	2/25/2019	3/6/2019	2/23/2019	2/28/2019	2/28/2019	2/28/2019	3/1/2019	3/5/2019
					Sample Name:	MW-169S_022519	MW-170S_030619	MW-171S-022319	MW-172S-022819	MW-173S-022819	MW-174S-022819	MW-175S-030119	MW-176S_030519
					Screen Interval (ft. bgs):	2-7	4.5-9.5	2-7	4.5-9.5	5.5-10.5	5.5-10.5	6-11	5-10
					Lab SDG #:	108555-1	109088-1	108503-1	108806-1	108812-1	108804-1	108807-1	109011-1
analytic_method	chemical_name	fraction	cas_rn	Ford_LTP_Offsite Res DW	MI GW (DEQ2018) NON-RES DW								
SW8468260BBYSIM	1,4-Dioxane	T	123-91-1	7.2	350	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
SW8260B	1,1-Dichloroethene	T	75-35-4	7.0	7	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	T	156-59-2	70	70	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Tetrachloroethene	T	127-18-4	5.0	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	T	156-60-5	100	100	< 1.0	< 1.0	< 1.0	0.21 J	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	T	79-01-6	1.0	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.14 J	< 1.0	< 1.0
SW8260B	Vinyl chloride	T	75-01-4	1.0	2	0.21 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

					Location:	MW-177S	MW-178S	MW-179S	MW-181S	MW-182S	MW-182S	MW-183S
					Date:	3/5/2019	3/4/2019	3/4/2019	3/4/2019	3/5/2019	3/5/2019	3/1/2019
					Sample Name:	MW-177S_030519	MW-178S_030419	MW-179S_030419	MW-181S_030419	MW-182S_030519	DUP-05_030519	MW-183S-030119
					Screen Interval (ft. bgs):	4-9	4.5-9.5	6-11	3.5-8.5	4-9	4-9	8-13
					Lab SDG #:	109013-1	108923-1	108922-1	108920-1	109010-1	109010-1	108813-1
analytic_method	chemical_name	fraction	cas_rn	Ford_LTP_Offsite Res DW	MI GW (DEQ2018) NON-RES DW							
SW8468260BBYSIM	1,4-Dioxane	T	123-91-1	7.2	350	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
SW8260B	1,1-Dichloroethene	T	75-35-4	7.0	7	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	T	156-59-2	70	70	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Tetrachloroethene	T	127-18-4	5.0	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	T	156-60-5	100	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	T	79-01-6	1.0	5	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Vinyl chloride	T	75-01-4	1.0	2	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Notes:
All units are measured in micrograms per liter.

Abbreviations:

ft bgs	Feet below ground surface
J	Estimated value
<	Less than

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Appendix A – Summary of Off-Site Shallow Groundwater Sampling Results
2Q 2019
Ford Livonia Transmission Plant

				Location:	MW-72	MW-72S	MW-73D	MW-73SR	MW-74	MW-74S	MW-75D	MW-75SR	MW-76	MW-76S	MW-77	MW-77S	MW-78	MW-78S	MW-79D
				Date:	5/17/2019	5/8/2019	5/8/2019	5/8/2019	5/17/2019	5/8/2019	5/15/2019	5/9/2019	5/17/2019	5/8/2019	5/16/2019	5/16/2019	5/13/2019	5/13/2019	5/15/2019
				Screen Interval (ft. bgs):	15-20	3-13	13.5-18.5	2.5-12.5	14-19	3-13	12-17	2.5-12.5	15-20	4.5-14.5	9-14	2.5-12.5	7-12	2.5-12.5	10-15
Analytic Method	Chemical Name	Ford LTP Offsite Res DW	MI GW (EGLE2018) NON-RES DW																
SW8468260BBYSIM	1,4-Dioxane	7.2	350		< 2.0	< 2.0	2.3	< 2.0	< 2.0	< 2.0	1.5 J	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	0.99 J
SW8260B	1,1-Dichloroethene	7	7		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	70	70		< 1.0	< 1.0	< 1.0	1.8	1.3	0.97 J	< 1.0	< 1.0	1.2	< 1.0	0.39 J	< 1.0	0.19 J	< 1.0	< 1.0
SW8260B	Tetrachloroethene	5	5		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	100	100		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	1	5		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Vinyl chloride	1	2		**1.7**	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	**1.7**	< 1.0	< 1.0	< 1.0	0.24 J	< 1.0	< 1.0	< 1.0	**2.6**

				Location:	MW-79SR	MW-80SR	MW-81	MW-81S	MW-82D	MW-82SR	MW-83	MW-83S	MW-84	MW-84S	MW-85	MW-85SR	MW-86	MW-86S	MW-87
				Date:	5/15/2019	43595	5/17/2019	5/17/2019	5/17/2019	5/17/2019	5/22/2019	5/22/2019	5/21/2019	5/9/2019	5/17/2019	4/12/2019	5/21/2019	5/13/2019	5/21/2019
				Screen Interval (ft. bgs):	2.5-12.5	2.5-12.5	8-13	2.5-12.5	18-23	5-15	8-13	3-13	8-13	2.5-12.5	8-13	4.5-9.5	12-17	2.5-12.5	14-19
Analytic Method	Chemical Name	Ford LTP Offsite Res DW	MI GW (EGLE2018) NON-RES DW																
SW8468260BBYSIM	1,4-Dioxane	7.2	350		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	1.3 J	< 2.0	< 2.0	< 2.0	< 2.0
SW8260B	1,1-Dichloroethene	7	7		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	70	70		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Tetrachloroethene	5	5		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	100	100		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	1	5		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Vinyl chloride	1	2		0.36 J	**3.2**	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	**5.4**	**2.2**	< 1.0	< 1.0	< 1.0

				Location:	MW-87S	MW-88S	MW-89S	MW-90S	MW-91S	MW-92S	MW-93S	MW-94S	MW-95S	MW-96S	MW-97S	MW-98S	MW-99S	MW-100S	MW-101S
				Date:	5/13/2019	5/16/2019	5/10/2019	5/14/2019	5/21/2019	5/17/2019	5/13/2019	5/15/2019	5/16/2019	5/16/2019	5/10/2019	5/10/2019	5/9/2019	5/9/2019	5/8/2019
				Screen Interval (ft. bgs):	4.5-14.5	3-13	3-13	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	3-13	3-13	4.5-14.5
Analytic Method	Chemical Name	Ford LTP Offsite Res DW	MI GW (EGLE2018) NON-RES DW																
SW8468260BBYSIM	1,4-Dioxane	7.2	350		< 2.0	< 2.0	< 2.0	1.3 J	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
SW8260B	1,1-Dichloroethene	7	7		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	70	70		< 1.0	< 1.0	0.43 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.89 J	< 1.0	< 1.0
SW8260B	Tetrachloroethene	5	5		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	100	100		< 1.0	< 1.0	< 1.0	0.24 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	1	5		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Vinyl chloride	1	2		< 1.0	< 1.0	**2.0**	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Notes:
All units are measured in micrograms per liter (µg/l).
All results are compared to the EGLE Part 201 Generic Cleanup Criteria, December 31, 2013.

Bolded	Result exceeds residential Drinking Water criteria
<	Result not detected above reporting limit.

Abbreviations:

EGLE	Michigan Department of Environment, Great Lakes, and Energy
ft. bgs	feet below ground surface
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Appendix A – Summary of Off-Site Shallow Groundwater Sampling Results
2Q 2019
Ford Livonia Transmission Plant

				Location:	MW-102	MW-102S	MW-103S	MW-104S	MW-105S	MW-106S	MW-107S	MW-108S	MW-109S	MW-110S	MW-111S	MW-112S	MW-115S	MW-116S	MW-117S
				Date:	5/17/2019	5/14/2019	5/16/2019	5/15/2019	5/14/2019	5/16/2019	5/10/2019	5/14/2019	5/10/2019	5/15/2019	5/15/2019	5/16/2019	5/17/2019	5/16/2019	5/16/2019
				Screen Interval (ft. bgs):	10-15	2.5-12.5	2.0-7.0	9.0-14.0	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	8.0-13.0	8.0-13.0	2.5-12.5	2.5-12.5	3-13	2.5-12.5
Analytic Method	Chemical Name	Ford LTP Offsite Res DW	MI GW (EGLE2018) NON-RES DW																
SW8468260BBYSIM	1,4-Dioxane	7.2	350		1.1 J	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	0.93 J	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
SW8260B	1,1-Dichloroethene	7	7		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	70	70		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.21 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.16 J
SW8260B	Tetrachloroethene	5	5		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	100	100		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	1	5		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.37 J
SW8260B	Vinyl chloride	1	2		**1.8**	< 1.0	0.36 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	**2.2 J**	< 1.0	**1.1**

				Location:	MW-118S	MW-119S	MW-121S	MW-125	MW-125S	MW-126S	MW-127S	MW-128S	MW-129	MW-129S	MW-130S	MW-131S	MW-132S	MW-133S	MW-134S
				Date:	5/15/2019	5/10/2019	5/13/2019	4/18/2019	4/18/2019	5/13/2019	5/16/2019	5/22/2019	4/18/2019	4/18/2019	5/13/2019	5/14/2019	5/14/2019	5/23/2019	5/20/2019
				Screen Interval (ft. bgs):	2.5-12.5	2.5-12.5	2.5-12.5	7-12	2-7	3-13	3-13	4-14	10-15	2-7	3-13	2.5-12.5	2.5-12.5	4-9	5-10
Analytic Method	Chemical Name	Ford LTP Offsite Res DW	MI GW (EGLE2018) NON-RES DW																
SW8468260BBYSIM	1,4-Dioxane	7.2	350		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	1.4 J	1.3 J	< 2.0	< 2.0	< 2.0
SW8260B	1,1-Dichloroethene	7	7		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	70	70		< 1.0	0.16 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Tetrachloroethene	5	5		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	100	100		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	1	5		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Vinyl chloride	1	2		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.97 J	0.85 J	< 1.0	< 1.0	< 1.0

				Location:	MW-135S	MW-136S	MW-137S	MW-138S	MW-139S	MW-140S	MW-141S	MW-142S	MW-143S	MW-144S	MW-145S	MW-146S	MW-147S	MW-148S	MW-150S
				Date:	5/20/2019	5/22/2019	5/13/2019	5/16/2019	5/9/2019	5/16/2019	5/15/2019	5/23/2019	5/23/2019	5/20/2019	5/23/2019	5/14/2019	5/15/2019	5/15/2019	5/22/2019
				Screen Interval (ft. bgs):	5-10	2-7	2-7	2-7	2-7	2-7	3-8	2.5-7.5	5.5-10.5	7-12	6-11	6-11	2-7	2-7	2-7
Analytic Method	Chemical Name	Ford LTP Offsite Res DW	MI GW (EGLE2018) NON-RES DW																
SW8468260BBYSIM	1,4-Dioxane	7.2	350		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	1.2 J	< 2.0	1.1 J	< 2.0
SW8260B	1,1-Dichloroethene	7	7		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	70	70		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Tetrachloroethene	5	5		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	100	100		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	1	5		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Vinyl chloride	1	2		< 1.0	< 1.0	0.91 J	**1.6**	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.20 J	< 1.0	0.76 J	< 1.0

Notes:
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All results are compared to the EGLE Part 201 Generic Cleanup Criteria, December 31, 2013.

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Abbreviations:

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Appendix A – Summary of Off-Site Shallow Groundwater Sampling Results
2Q 2019
Ford Livonia Transmission Plant

				Location:	MW-151S	MW-152S	MW-153S	MW-154S	MW-155S	MW-156S	MW-157S	MW-158S	MW-159S	MW-160S	MW-161S	MW-162S	MW-163S	MW-164S	MW-165S
				Date:	5/21/2019	5/14/2019	5/10/2019	5/14/2019	5/9/2019	5/17/2019	5/16/2019	5/10/2019	5/9/2019	5/16/2019	5/9/2019	5/17/2019	5/10/2019	5/10/2019	5/10/2019
				Screen Interval (ft. bgs):	2.5-7.5	2.5-7.5	2-7	2-7	2-7	3-8	2.5-7.5	2.5-7.5	4-9	4-9	2.5-7.5	3-8	2-7	3-8	2-7
Analytic Method	Chemical Name	Ford LTP Offsite Res DW	MI GW (EGLE2018) NON-RES DW																
SW8468260BBYSIM	1,4-Dioxane	7.2	350		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
SW8260B	1,1-Dichloroethene	7	7		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	70	70		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Tetrachloroethene	5	5		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	100	100		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	1	5		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Vinyl chloride	1	2		0.92 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

				Location:	MW-166S	MW-167S	MW-168S	MW-169S	MW-170S	MW-171S	MW-172S	MW-173S	MW-174S	MW-175S	MW-176S	MW-177S	MW-178S	MW-179S	MW-180SR
				Date:	5/23/2019	5/20/2019	5/15/2019	5/15/2019	5/10/2019	5/13/2019	5/13/2019	5/13/2019	5/13/2019	5/13/2019	5/13/2019	5/15/2019	5/15/2019	5/17/2019	5/16/2019
				Screen Interval (ft. bgs):	6-11	5-10	2-7	2-7	4.5-9.5	2-7	4.5-9.5	5.5-10.5	5.5-10.5	6-11	5-10	4-9	4.5-9.5	6-11	6.5-11.5
Analytic Method	Chemical Name	Ford LTP Offsite Res DW	MI GW (EGLE2018) NON-RES DW																
SW8468260BBYSIM	1,4-Dioxane	7.2	350		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	2.8
SW8260B	1,1-Dichloroethene	7	7		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	70	70		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Tetrachloroethene	5	5		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	100	100		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	1	5		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Vinyl chloride	1	2		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

				Location:	MW-181S	MW-182S	MW-183S	MW-184S	MW-185S	MW-186S	MW-187	MW-187S	MW-188S	MW-189	MW-189S	MW-190	MW-190S	MW-191S	MW-192S
				Date:	5/16/2019	5/13/2019	5/13/2019	5/15/2019	5/9/2019	4/12/2019	4/12/2019	4/12/2019	4/18/2019	4/16/2019	4/16/2019	4/19/2019	4/19/2019	4/22/2019	4/11/2019
				Screen Interval (ft. bgs):	3.5-8.5	4-9	8-13	4.5-9.5	6-11	2.5-7.5	13-Aug	8-Mar	8-Mar	15-Oct	4.5-9.5	14-Sep	2.5-7.5	2.5-7.5	2.5-7.5
Analytic Method	Chemical Name	Ford LTP Offsite Res DW	MI GW (EGLE2018) NON-RES DW																
SW8468260BBYSIM	1,4-Dioxane	7.2	350		< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
SW8260B	1,1-Dichloroethene	7	7		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	70	70		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	0.74 J	1.0	2.3	< 1.0
SW8260B	Tetrachloroethene	5	5		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	100	100		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	1	5		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	0.57 J	< 1.0
SW8260B	Vinyl chloride	1	2		< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Notes:
All units are measured in micrograms per liter (µg/l).
All results are compared to the EGLE Part 201 Generic Cleanup Criteria, December 31, 2013.

Bolded	Result exceeds residential Drinking Water criteria
<	Result not detected above reporting limit.

Abbreviations:

EGLE	Michigan Department of Environment, Great Lakes, and Energy
ft. bgs	feet below ground surface
J	estimated result

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Appendix A – Summary of Off-Site Shallow Groundwater Sampling Results
3Q 2019
Ford Livonia Transmission Plant

Location:				MW-72	MW-72S	MW-73D	MW-73SR	MW-74	MW-74S	MW-75D	MW-75SR	MW-76	MW-76S	MW-77	MW-77S	MW-78	MW-78S	MW-79D
Date:				9/23/2019	9/23/2019	9/24/2019	9/24/2019	9/18/2019	9/18/2019	9/18/2019	9/18/2019	9/17/2019	9/17/2019	9/17/2019	9/17/2019	9/19/2019	9/19/2019	9/19/2019
Screen Interval (ft. bgs):				15-20	3-13	13.5-18.5	2.5-12.5	14-19	3-13	12-17	2.5-12.5	15-20	4.5-14.5	9-14	2.5-12.5	7-12	2.5-12.5	10-15
Analytic Method	Chemical Name	Ford LTP Offsite Res DW	MI GW (EGLE2018) NON-RES DW															
SW8468260BBYSIM	1,4-Dioxane	7.2	350	< 2.0	< 2.0	3.8	< 2.0	1.4 J	< 2.0	3.3	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
SW8260B	1,1-Dichloroethene	7.0	7.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	70	70	< 1.0	< 1.0	< 1.0	3.0	0.62 J	1.0	< 1.0	< 1.0	1.4	< 1.0	0.66 J	< 1.0	0.22 J	< 1.0	< 1.0
SW8260B	Tetrachloroethene	5.0	5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	100	100	< 1.0	< 1.0	< 1.0	0.35 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	1.0	5.0	< 1.0	< 1.0	< 1.0	0.34 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Vinyl chloride	1.0	2.0	**1.5**	< 1.0	0.48 J	**1.3**	**1.7**	< 1.0	**1.6**	0.51 J	< 1.0	< 1.0	0.35 J	< 1.0	< 1.0	< 1.0	**1.5**

Location:				MW-79SR	MW-80SR	MW-81	MW-81S	MW-82D	MW-82SR	MW-83	MW-83S	MW-84	MW-84S	MW-85	MW-85SR	MW-86	MW-86S	MW-87
Date:				9/18/2019	9/23/2019	9/19/2019	9/19/2019	9/23/2019	9/23/2019	9/18/2019	9/18/2019	9/24/2019	9/24/2019	9/17/2019	9/17/2019	9/19/2019	9/19/2019	9/20/2019
Screen Interval (ft. bgs):				2.5-12.5	2.5-12.5	8-13	2.5-12.5	18-23	5-15	8-13	3-13	8-13	2.5-12.5	8-13	4.5-9.5	12-17	2.5-12.5	14-19
Analytic Method	Chemical Name	Ford LTP Offsite Res DW	MI GW (EGLE2018) NON-RES DW															
SW8468260BBYSIM	1,4-Dioxane	7.2	350	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
SW8260B	1,1-Dichloroethene	7.0	7.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	70	70	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Tetrachloroethene	5.0	5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	100	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	1.0	5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.17 J	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Vinyl chloride	1.0	2.0	0.40 J	**3.4**	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	**6.5**	**2.1**	< 1.0	< 1.0	< 1.0

Location:				MW-87S	MW-88S	MW-89S	MW-90S	MW-91S	MW-92S	MW-93S	MW-94S	MW-95S	MW-96S	MW-97S	MW-98S	MW-99S	MW-100S	MW-101S
Date:				9/20/2019	9/17/2019	9/24/2019	9/20/2019	9/18/2019	9/18/2019	9/16/2019	9/19/2019	9/18/2019	9/20/2019	9/19/2019	9/20/2019	9/16/2019	9/16/2019	9/16/2019
Screen Interval (ft. bgs):				4.5-14.5	3-13	3-13	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	3-13	3-13	4.5-14.5
Analytic Method	Chemical Name	Ford LTP Offsite Res DW	MI GW (EGLE2018) NON-RES DW															
SW8468260BBYSIM	1,4-Dioxane	7.2	350	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
SW8260B	1,1-Dichloroethene	7.0	7.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	70	70	< 1.0	< 1.0	0.87 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.23 J	< 1.0	< 1.0	0.21 J	0.30 J	< 1.0	< 1.0
SW8260B	Tetrachloroethene	5.0	5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	100	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	1.0	5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Vinyl chloride	1.0	2.0	< 1.0	< 1.0	**2.3**	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.54 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Notes:
All units are measured in micrograms per liter (µg/l).
All results are compared to the EGLE Part 201 Generic Cleanup Criteria, December 31, 2013.
Bolded Result exceeds residential Drinking Water criteria
< Result not detected above reporting limit.

Abbreviations:
EGLE Michigan Department of Environment, Great Lakes, and Energy
ft. bgs feet below ground surface
J estimated result

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Appendix A – Summary of Off-Site Shallow Groundwater Sampling Results
3Q 2019
Ford Livonia Transmission Plant

Location:				MW-102	MW-102S	MW-103S	MW-104S	MW-105S	MW-106S	MW-107S	MW-108S	MW-109S	MW-110S	MW-111S	MW-112S	MW-115S	MW-116S	MW-117S
Date:				9/18/2019	9/18/2019	9/20/2019	9/17/2019	9/16/2019	9/23/2019	9/24/2019	9/19/2019	9/23/2019	9/17/2019	9/19/2019	9/17/2019	9/18/2019	9/16/2019	9/18/2019
Screen Interval (ft. bgs):				10-15	2.5-12.5	2-7	9-14	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	8-13	8-13	2.5-12.5	2.5-12.5	3-13	2.5-12.5
Analytic Method	Chemical Name	Ford LTP Offsite Res DW	MI GW (EGLE2018) NON-RES DW															
SW8468260BBYSIM	1,4-Dioxane	7.2	350	1.0 J	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
SW8260B	1,1-Dichloroethene	7.0	7.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	70	70	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.38 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Tetrachloroethene	5.0	5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	100	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	1.0	5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.27 J
SW8260B	Vinyl chloride	1.0	2.0	1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	**3.1**	< 1.0	0.54 J

Location:				MW-118S	MW-119S	MW-121S	MW-123S	MW-125	MW-125S	MW-126S	MW-127S	MW-128S	MW-129	MW-129S	MW-130S	MW-131S	MW-132S	MW-133S
Date:				9/18/2019	9/16/2019	9/19/2019	9/16/2019	9/25/2019	9/25/2019	9/17/2019	9/18/2019	9/20/2019	9/24/2019	9/23/2019	9/20/2019	9/16/2019	9/16/2019	9/17/2019
Screen Interval (ft. bgs):				2.5-12.5	2.5-12.5	2.5-12.5	2.5-12.5	7-12	2-7	3-13	3-13	4-14	10-15	2-7	3-13	2.5-12.5	2.5-12.5	4-9
Analytic Method	Chemical Name	Ford LTP Offsite Res DW	MI GW (EGLE2018) NON-RES DW															
SW8468260BBYSIM	1,4-Dioxane	7.2	350	< 2.0	< 2.0	< 2.0	1.1 J	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	1.3 J	< 2.0	< 2.0
SW8260B	1,1-Dichloroethene	7.0	7.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	70	70	< 1.0	0.21 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Tetrachloroethene	5.0	5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	100	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	1.0	5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Vinyl chloride	1.0	2.0	0.50 J	< 1.0	< 1.0	**3.9**	< 1.0	< 1.0	< 1.0	**2.7**	< 1.0	< 1.0	< 1.0	**1.2**	0.87 J	< 1.0	< 1.0

Location:				MW-134S	MW-135S	MW-136S	MW-137S	MW-138S	MW-139S	MW-140S	MW-141S	MW-142S	MW-143S	MW-144S	MW-145S	MW-146S	MW-147S	MW-148S
Date:				9/17/2019	9/16/2019	9/18/2019	9/23/2019	9/23/2019	9/20/2019	9/18/2019	9/18/2019	9/16/2019	9/19/2019	9/19/2019	9/19/2019	9/17/2019	9/19/2019	9/20/2019
Screen Interval (ft. bgs):				5-10	5-10	2-7	2-7	2-7	2-7	2-7	3-8	2.5-7.5	5.5-10.5	7-12	6-11	6-11	2-7	2-7
Analytic Method	Chemical Name	Ford LTP Offsite Res DW	MI GW (EGLE2018) NON-RES DW															
SW8468260BBYSIM	1,4-Dioxane	7.2	350	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	1.1 J	< 2.0	< 2.0
SW8260B	1,1-Dichloroethene	7.0	7.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	70	70	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Tetrachloroethene	5.0	5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	100	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	1.0	5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Vinyl chloride	1.0	2.0	< 1.0	< 1.0	0.96 J	**1.1**	**1.4**	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.20 J	0.82 J	**2.2**

Notes:
All units are measured in micrograms per liter (µg/l).
All results are compared to the EGLE Part 201 Generic Cleanup Criteria, December 31, 2013.
Bolded Result exceeds residential Drinking Water criteria
< Result not detected above reporting limit.

Abbreviations:
EGLE Michigan Department of Environment, Great Lakes, and Energy
ft. bgs feet below ground surface
J estimated result

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Appendix A – Summary of Off-Site Shallow Groundwater Sampling Results
3Q 2019
Ford Livonia Transmission Plant

			Location:	MW-149S	MW-150S	MW-152S	MW-153S	MW-154S	MW-155S	MW-156S	MW-157S	MW-158S	MW-159S	MW-160S	MW-161S	MW-162S	MW-163S	MW-164S	MW-165S
			Date:	9/18/2019	9/19/2019	9/20/2019	9/20/2019	9/20/2019	9/17/2019	9/19/2019	9/19/2019	9/23/2019	9/23/2019	9/18/2019	9/24/2019	9/18/2019	9/18/2019	9/19/2019	9/19/2019
			Screen Interval (ft. bgs):	2-7	2-7	2.5-7.5	2-7	2-7	2-7	3-8	2.5-7.5	2.5-7.5	4-9	4-9	2.5-7.5	3-8	2-7	3-8	2-7
Analytic Method	Chemical Name	Ford LTP Offsite Res DW	MI GW (EGLE2018) NON-RES DW																
SW8468260BBYSIM	1,4-Dioxane	7.2	350	0.96 J	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
SW8260B	1,1-Dichloroethene	7.0	7.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	70	70	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Tetrachloroethene	5.0	5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	100	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	1.0	5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Vinyl chloride	1.0	2.0	**1.9**	0.35 J	0.34 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

			Location:	MW-166S	MW-167S	MW-168S	MW-169S	MW-170S	MW-171S	MW-172S	MW-173S	MW-174S	MW-175S	MW-176S	MW-177S	MW-178S	MW-179S	MW-180SR	MW-181S
			Date:	9/17/2019	9/20/2019	9/16/2019	9/17/2019	9/24/2019	9/16/2019	9/20/2019	9/20/2019	9/24/2019	9/20/2019	9/23/2019	9/19/2019	9/18/2019	9/17/2019	9/17/2019	9/17/2019
			Screen Interval (ft. bgs):	6-11	5-10	2-7	2-7	4.5-9.5	2-7	4.5-9.5	5.5-10.5	5.5-10.5	6-11	5-10	4-9	4.5-9.5	6-11	6.5-11.5	3.5-8.5
Analytic Method	Chemical Name	Ford LTP Offsite Res DW	MI GW (EGLE2018) NON-RES DW																
SW8468260BBYSIM	1,4-Dioxane	7.2	350	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	1.2 J	< 2.0
SW8260B	1,1-Dichloroethene	7.0	7.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	70	70	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Tetrachloroethene	5.0	5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.16 J	< 1.0
SW8260B	trans-1,2-Dichloroethene	100	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	1.0	5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Vinyl chloride	1.0	2.0	< 1.0	< 1.0	0.38 J	0.28 J	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

			Location:	MW-182S	MW-183S	MW-184S	MW-185S	MW-186S	MW-187	MW-187S	MW-188S	MW-189	MW-189S	MW-190	MW-190S	MW-191S	MW-192S	MW-193S
			Date:	9/18/2019	9/17/2019	9/24/2019	9/23/2019	9/24/2019	9/19/2019	9/19/2019	9/19/2019	9/18/2019	9/18/2019	9/19/2019	9/19/2019	9/17/2019	9/20/2019	9/16/2019
			Screen Interval (ft. bgs):	4-9	8-13	4.5-9.5	6-11	2.5-7.5	8-13	3-8	3-8	10-15	4.5-9.5	9-14	2.5-7.5	2.5-7.5	2.5-7.5	3-8
Analytic Method	Chemical Name	Ford LTP Offsite Res DW	MI GW (EGLE2018) NON-RES DW															
SW8468260BBYSIM	1,4-Dioxane	7.2	350	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
SW8260B	1,1-Dichloroethene	7.0	7.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	cis-1,2-Dichloroethene	70	70	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	1.5	1.1	5.2	0.34 J	< 1.0
SW8260B	Tetrachloroethene	5.0	5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	trans-1,2-Dichloroethene	100	100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
SW8260B	Trichloroethene	1.0	5.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	0.59 J	< 1.0	< 1.0
SW8260B	Vinyl chloride	1.0	2.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Notes:
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