

ANALYTICAL REPORT

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Laboratory Job ID: 460-196898-1
Client Project/Site: Ford LTP Livonia On-site

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

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



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Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia On-site

Job ID: 460-196898-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
F1	MS and/or MSD Recovery is outside acceptance limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.
U	Indicates the analyte was analyzed for but not detected.

Glossary

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

Case Narrative

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia On-site

Job ID: 460-196898-1

Job ID: 460-196898-1

Laboratory: Eurofins TestAmerica, Edison

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: Ford LTP Livonia On-site

Report Number: 460-196898-1

With the exceptions noted as flags or footnotes, standard analytical protocols were followed in the analysis of the samples and no problems were encountered or anomalies observed. In addition all laboratory quality control samples were within established control limits, with any exceptions noted below. Each sample was analyzed to achieve the lowest possible reporting limit within the constraints of the method. In some cases, due to interference or analytes present at high concentrations, samples were diluted. For diluted samples, the reporting limits are adjusted relative to the dilution required.

Eurofins TestAmerica, Edison attests to the validity of the laboratory data generated by Eurofins TestAmerica facilities reported herein. All analyses performed by Eurofins TestAmerica facilities were done using established laboratory SOPs that incorporate QA/QC procedures described in the application methods. Eurofins TestAmerica's operations groups have reviewed the data for compliance with the laboratory QA/QC plan, and data have been found to be compliant with laboratory protocols unless otherwise noted below.

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory.

Calculations are performed before rounding to avoid round-off errors in calculated results.

All holding times were met and proper preservation noted for the methods performed on these samples, unless otherwise detailed in the individual sections below.

All solid sample results are reported on an "as received" basis unless otherwise indicated by the presence of a % solids value in the method header.

This laboratory report is confidential and is intended for the sole use of Eurofins TestAmerica and its client.

RECEIPT

The samples were received on 11/18/2019 9:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 4.1° C.

VOLATILE ORGANIC COMPOUNDS (GCMS)

Samples TRIP BLANK (460-196898-1), PW-16-02_111419 (460-196898-2), TW-16-03_111419 (460-196898-3), TW-16-04_111419 (460-196898-4), MW-37_111419 (460-196898-5) and MW-32_111419 (460-196898-6) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260C. The samples were analyzed on 11/26/2019 and 11/27/2019.

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

VOLATILE ORGANIC COMPOUNDS (GC/MS)

Samples PW-16-02_111419 (460-196898-2), TW-16-03_111419 (460-196898-3), TW-16-04_111419 (460-196898-4), MW-37_111419 (460-196898-5) and MW-32_111419 (460-196898-6) were analyzed for Volatile organic compounds (GC/MS) in accordance with SW-846 Method 8260C SIM. The samples were analyzed on 11/24/2019.

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

Detection Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia On-site

Job ID: 460-196898-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 460-196898-1

No Detections.

Client Sample ID: PW-16-02_111419

Lab Sample ID: 460-196898-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	0.67	J	1.0	0.22	ug/L	1		8260C	Total/NA
Vinyl chloride	0.40	J	1.0	0.17	ug/L	1		8260C	Total/NA

Client Sample ID: TW-16-03_111419

Lab Sample ID: 460-196898-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.43	J	2.0	0.33	ug/L	1		8260C SIM	Total/NA
cis-1,2-Dichloroethene	52		1.0	0.22	ug/L	1		8260C	Total/NA
Vinyl chloride	87		1.0	0.17	ug/L	1		8260C	Total/NA

Client Sample ID: TW-16-04_111419

Lab Sample ID: 460-196898-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.86	J	2.0	0.33	ug/L	1		8260C SIM	Total/NA
cis-1,2-Dichloroethene	20		1.0	0.22	ug/L	1		8260C	Total/NA
Vinyl chloride	46		1.0	0.17	ug/L	1		8260C	Total/NA

Client Sample ID: MW-37_111419

Lab Sample ID: 460-196898-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	2.9		1.0	0.22	ug/L	1		8260C	Total/NA

Client Sample ID: MW-32_111419

Lab Sample ID: 460-196898-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	3.0		1.0	0.22	ug/L	1		8260C	Total/NA
Vinyl chloride	0.70	J	1.0	0.17	ug/L	1		8260C	Total/NA

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Edison

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia On-site

Job ID: 460-196898-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 460-196898-1

Date Collected: 11/14/19 00:00

Matrix: Water

Date Received: 11/18/19 09:30

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.26	ug/L	-		11/27/19 12:39	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.22	ug/L	-		11/27/19 12:39	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L	-		11/27/19 12:39	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L	-		11/27/19 12:39	1
Trichloroethene	1.0	U	1.0	0.31	ug/L	-		11/27/19 12:39	1
Vinyl chloride	1.0	U	1.0	0.17	ug/L	-		11/27/19 12:39	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	101		74 - 132		11/27/19 12:39	1
Toluene-d8 (Surr)	86		80 - 120		11/27/19 12:39	1
Dibromofluoromethane (Surr)	104		72 - 131		11/27/19 12:39	1
4-Bromofluorobenzene	100		77 - 124		11/27/19 12:39	1

Client Sample ID: PW-16-02_111419

Lab Sample ID: 460-196898-2

Date Collected: 11/14/19 11:57

Matrix: Water

Date Received: 11/18/19 09:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.33	ug/L	-		11/24/19 05:33	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	97		72 - 133		11/24/19 05:33	1

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.26	ug/L	-		11/27/19 14:15	1
cis-1,2-Dichloroethene	0.67	J	1.0	0.22	ug/L	-		11/27/19 14:15	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L	-		11/27/19 14:15	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L	-		11/27/19 14:15	1
Trichloroethene	1.0	U	1.0	0.31	ug/L	-		11/27/19 14:15	1
Vinyl chloride	0.40	J	1.0	0.17	ug/L	-		11/27/19 14:15	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	99		74 - 132		11/27/19 14:15	1
Toluene-d8 (Surr)	89		80 - 120		11/27/19 14:15	1
Dibromofluoromethane (Surr)	102		72 - 131		11/27/19 14:15	1
4-Bromofluorobenzene	102		77 - 124		11/27/19 14:15	1

Client Sample ID: TW-16-03_111419

Lab Sample ID: 460-196898-3

Date Collected: 11/14/19 11:04

Matrix: Water

Date Received: 11/18/19 09:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.43	J	2.0	0.33	ug/L	-		11/24/19 05:56	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	98		72 - 133		11/24/19 05:56	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia On-site

Job ID: 460-196898-1

Client Sample ID: TW-16-03_111419

Lab Sample ID: 460-196898-3

Date Collected: 11/14/19 11:04

Matrix: Water

Date Received: 11/18/19 09:30

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.26	ug/L	-		11/26/19 05:05	1
cis-1,2-Dichloroethene	52		1.0	0.22	ug/L			11/26/19 05:05	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L			11/26/19 05:05	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L			11/26/19 05:05	1
Trichloroethene	1.0	U	1.0	0.31	ug/L			11/26/19 05:05	1
Vinyl chloride	87		1.0	0.17	ug/L			11/26/19 05:05	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	99		74 - 132		11/26/19 05:05	1
Toluene-d8 (Surr)	90		80 - 120		11/26/19 05:05	1
Dibromofluoromethane (Surr)	100		72 - 131		11/26/19 05:05	1
4-Bromofluorobenzene	98		77 - 124		11/26/19 05:05	1

Client Sample ID: TW-16-04_111419

Lab Sample ID: 460-196898-4

Date Collected: 11/14/19 10:15

Matrix: Water

Date Received: 11/18/19 09:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.86	J	2.0	0.33	ug/L	-		11/24/19 06:19	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	96		72 - 133		11/24/19 06:19	1

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.26	ug/L	-		11/26/19 05:29	1
cis-1,2-Dichloroethene	20		1.0	0.22	ug/L			11/26/19 05:29	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L			11/26/19 05:29	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L			11/26/19 05:29	1
Trichloroethene	1.0	U	1.0	0.31	ug/L			11/26/19 05:29	1
Vinyl chloride	46		1.0	0.17	ug/L			11/26/19 05:29	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	101		74 - 132		11/26/19 05:29	1
Toluene-d8 (Surr)	91		80 - 120		11/26/19 05:29	1
Dibromofluoromethane (Surr)	101		72 - 131		11/26/19 05:29	1
4-Bromofluorobenzene	98		77 - 124		11/26/19 05:29	1

Client Sample ID: MW-37_111419

Lab Sample ID: 460-196898-5

Date Collected: 11/14/19 14:03

Matrix: Water

Date Received: 11/18/19 09:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.33	ug/L	-		11/24/19 06:43	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	92		72 - 133		11/24/19 06:43	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia On-site

Job ID: 460-196898-1

Client Sample ID: MW-37_111419

Lab Sample ID: 460-196898-5

Date Collected: 11/14/19 14:03

Matrix: Water

Date Received: 11/18/19 09:30

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.26	ug/L			11/26/19 05:53	1
cis-1,2-Dichloroethene	2.9		1.0	0.22	ug/L			11/26/19 05:53	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L			11/26/19 05:53	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L			11/26/19 05:53	1
Trichloroethene	1.0	U	1.0	0.31	ug/L			11/26/19 05:53	1
Vinyl chloride	1.0	U	1.0	0.17	ug/L			11/26/19 05:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	101		74 - 132		11/26/19 05:53	1
Toluene-d8 (Surr)	92		80 - 120		11/26/19 05:53	1
Dibromofluoromethane (Surr)	99		72 - 131		11/26/19 05:53	1
4-Bromofluorobenzene	100		77 - 124		11/26/19 05:53	1

Client Sample ID: MW-32_111419

Lab Sample ID: 460-196898-6

Date Collected: 11/14/19 15:19

Matrix: Water

Date Received: 11/18/19 09:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.33	ug/L			11/24/19 07:06	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	98		72 - 133		11/24/19 07:06	1

Method: 8260C - Volatile Organic Compounds by GC/MS

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.26	ug/L			11/26/19 06:17	1
cis-1,2-Dichloroethene	3.0		1.0	0.22	ug/L			11/26/19 06:17	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L			11/26/19 06:17	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L			11/26/19 06:17	1
Trichloroethene	1.0	U	1.0	0.31	ug/L			11/26/19 06:17	1
Vinyl chloride	0.70	J	1.0	0.17	ug/L			11/26/19 06:17	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	100		74 - 132		11/26/19 06:17	1
Toluene-d8 (Surr)	90		80 - 120		11/26/19 06:17	1
Dibromofluoromethane (Surr)	101		72 - 131		11/26/19 06:17	1
4-Bromofluorobenzene	98		77 - 124		11/26/19 06:17	1

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia On-site

Job ID: 460-196898-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		DCA (74-132)	TOL (80-120)	DBFM (72-131)	BFB (77-124)
460-196895-B-3 MS	Matrix Spike	97	87	104	100
460-196895-B-3 MSD	Matrix Spike Duplicate	95	86	102	102
460-196898-1	TRIP BLANK	101	86	104	100
460-196898-2	PW-16-02_111419	99	89	102	102
460-196898-3	TW-16-03_111419	99	90	100	98
460-196898-4	TW-16-04_111419	101	91	101	98
460-196898-5	MW-37_111419	101	92	99	100
460-196898-6	MW-32_111419	100	90	101	98
LCS 460-658195/4	Lab Control Sample	98	91	101	98
LCS 460-658634/3	Lab Control Sample	97	88	103	99
LCSD 460-658195/5	Lab Control Sample Dup	97	90	102	99
MB 460-658195/8	Method Blank	100	91	100	99
MB 460-658634/7	Method Blank	100	88	102	100

Surrogate Legend

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

TOL = Toluene-d8 (Surr)

DBFM = Dibromofluoromethane (Surr)

BFB = 4-Bromofluorobenzene

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

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	BFB
		(72-133)
460-196898-2	PW-16-02_111419	97
460-196898-3	TW-16-03_111419	98
460-196898-4	TW-16-04_111419	96
460-196898-5	MW-37_111419	92
460-196898-6	MW-32_111419	98
LCS 460-657840/4	Lab Control Sample	90
LCSD 460-657840/5	Lab Control Sample Dup	100
MB 460-657840/8	Method Blank	105

Surrogate Legend

BFB = 4-Bromofluorobenzene

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia On-site

Job ID: 460-196898-1

Method: 8260C - Volatile Organic Compounds by GC/MS

Lab Sample ID: MB 460-658195/8
Matrix: Water
Analysis Batch: 658195

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

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.26	ug/L			11/25/19 22:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.22	ug/L			11/25/19 22:40	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L			11/25/19 22:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L			11/25/19 22:40	1
Trichloroethene	1.0	U	1.0	0.31	ug/L			11/25/19 22:40	1
Vinyl chloride	1.0	U	1.0	0.17	ug/L			11/25/19 22:40	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	100		74 - 132		11/25/19 22:40	1
Toluene-d8 (Surr)	91		80 - 120		11/25/19 22:40	1
Dibromofluoromethane (Surr)	100		72 - 131		11/25/19 22:40	1
4-Bromofluorobenzene	99		77 - 124		11/25/19 22:40	1

Lab Sample ID: LCS 460-658195/4
Matrix: Water
Analysis Batch: 658195

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	20.0	20.4		ug/L		102	74 - 123
cis-1,2-Dichloroethene	20.0	20.4		ug/L		102	80 - 120
Tetrachloroethene	20.0	17.7		ug/L		89	78 - 122
trans-1,2-Dichloroethene	20.0	20.7		ug/L		103	79 - 120
Trichloroethene	20.0	18.0		ug/L		90	77 - 120
Vinyl chloride	20.0	21.5		ug/L		107	62 - 138

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	98		74 - 132
Toluene-d8 (Surr)	91		80 - 120
Dibromofluoromethane (Surr)	101		72 - 131
4-Bromofluorobenzene	98		77 - 124

Lab Sample ID: LCSD 460-658195/5
Matrix: Water
Analysis Batch: 658195

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	20.0	20.0		ug/L		100	74 - 123	2	30
cis-1,2-Dichloroethene	20.0	20.9		ug/L		104	80 - 120	2	30
Tetrachloroethene	20.0	17.9		ug/L		89	78 - 122	1	30
trans-1,2-Dichloroethene	20.0	20.2		ug/L		101	79 - 120	2	30
Trichloroethene	20.0	18.3		ug/L		92	77 - 120	2	30
Vinyl chloride	20.0	21.4		ug/L		107	62 - 138	0	30

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	97		74 - 132
Toluene-d8 (Surr)	90		80 - 120
Dibromofluoromethane (Surr)	102		72 - 131

Eurofins TestAmerica, Edison

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia On-site

Job ID: 460-196898-1

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

Lab Sample ID: LCSD 460-658195/5
Matrix: Water
Analysis Batch: 658195

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

Surrogate	LCSD LCSD		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene	99		77 - 124

Lab Sample ID: MB 460-658634/7
Matrix: Water
Analysis Batch: 658634

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

Analyte	MB MB		RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
	Result	Qualifier							
1,1-Dichloroethene	1.0	U	1.0	0.26	ug/L			11/27/19 08:38	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.22	ug/L			11/27/19 08:38	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L			11/27/19 08:38	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L			11/27/19 08:38	1
Trichloroethene	1.0	U	1.0	0.31	ug/L			11/27/19 08:38	1
Vinyl chloride	1.0	U	1.0	0.17	ug/L			11/27/19 08:38	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
1,2-Dichloroethane-d4 (Surr)	100		74 - 132		11/27/19 08:38	1
Toluene-d8 (Surr)	88		80 - 120		11/27/19 08:38	1
Dibromofluoromethane (Surr)	102		72 - 131		11/27/19 08:38	1
4-Bromofluorobenzene	100		77 - 124		11/27/19 08:38	1

Lab Sample ID: LCS 460-658634/3
Matrix: Water
Analysis Batch: 658634

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

Analyte	Spike Added	LCS LCS		Unit	D	%Rec	%Rec. Limits
		Result	Qualifier				
1,1-Dichloroethene	20.0	22.2		ug/L		111	74 - 123
cis-1,2-Dichloroethene	20.0	22.6		ug/L		113	80 - 120
Tetrachloroethene	20.0	18.6		ug/L		93	78 - 122
trans-1,2-Dichloroethene	20.0	22.6		ug/L		113	79 - 120
Trichloroethene	20.0	19.9		ug/L		99	77 - 120
Vinyl chloride	20.0	22.7		ug/L		113	62 - 138

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	97		74 - 132
Toluene-d8 (Surr)	88		80 - 120
Dibromofluoromethane (Surr)	103		72 - 131
4-Bromofluorobenzene	99		77 - 124

Lab Sample ID: 460-196895-B-3 MS
Matrix: Water
Analysis Batch: 658634

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

Analyte	Sample Sample		Spike Added	MS MS		Unit	D	%Rec	%Rec. Limits
	Result	Qualifier		Result	Qualifier				
1,1-Dichloroethene	1.0	U F1	200	250	F1	ug/L		125	74 - 123
cis-1,2-Dichloroethene	1.0	U	200	231		ug/L		115	80 - 120
Tetrachloroethene	1.0	U	200	195		ug/L		97	78 - 122
trans-1,2-Dichloroethene	1.0	U F1	200	237		ug/L		118	79 - 120
Trichloroethene	1.0	U	200	211		ug/L		106	77 - 120

Eurofins TestAmerica, Edison

QC Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia On-site

Job ID: 460-196898-1

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

Lab Sample ID: 460-196895-B-3 MS

Client Sample ID: Matrix Spike

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 658634

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Vinyl chloride	1.0	U	200	238		ug/L		119	62 - 138
Surrogate	MS %Recovery	MS Qualifier	Limits						
1,2-Dichloroethane-d4 (Surr)	97		74 - 132						
Toluene-d8 (Surr)	87		80 - 120						
Dibromofluoromethane (Surr)	104		72 - 131						
4-Bromofluorobenzene	100		77 - 124						

Lab Sample ID: 460-196895-B-3 MSD

Client Sample ID: Matrix Spike Duplicate

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 658634

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U F1	200	242		ug/L		121	74 - 123	3	30
cis-1,2-Dichloroethene	1.0	U	200	234		ug/L		117	80 - 120	2	30
Tetrachloroethene	1.0	U	200	199		ug/L		100	78 - 122	2	30
trans-1,2-Dichloroethene	1.0	U F1	200	242	F1	ug/L		121	79 - 120	2	30
Trichloroethene	1.0	U	200	214		ug/L		107	77 - 120	1	30
Vinyl chloride	1.0	U	200	246		ug/L		123	62 - 138	3	30
Surrogate	MSD %Recovery	MSD Qualifier	Limits								
1,2-Dichloroethane-d4 (Surr)	95		74 - 132								
Toluene-d8 (Surr)	86		80 - 120								
Dibromofluoromethane (Surr)	102		72 - 131								
4-Bromofluorobenzene	102		77 - 124								

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

Lab Sample ID: MB 460-657840/8

Client Sample ID: Method Blank

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 657840

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	2.0	U	2.0	0.33	ug/L			11/23/19 23:19	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	105		72 - 133					11/23/19 23:19	1

Lab Sample ID: LCS 460-657840/4

Client Sample ID: Lab Control Sample

Matrix: Water

Prep Type: Total/NA

Analysis Batch: 657840

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	5.00	4.85		ug/L		97	66 - 135
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
4-Bromofluorobenzene	90		72 - 133				

Eurofins TestAmerica, Edison

QC Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia On-site

Job ID: 460-196898-1

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

Lab Sample ID: LCSD 460-657840/5
Matrix: Water
Analysis Batch: 657840

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

Analyte	Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,4-Dioxane	5.00	5.70		ug/L		114	66 - 135	16	30
Surrogate		LCSD	LCSD						
		%Recovery	Qualifier						Limits
4-Bromofluorobenzene		100							72 - 133

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QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia On-site

Job ID: 460-196898-1

GC/MS VOA

Analysis Batch: 657840

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-196898-2	PW-16-02_111419	Total/NA	Water	8260C SIM	
460-196898-3	TW-16-03_111419	Total/NA	Water	8260C SIM	
460-196898-4	TW-16-04_111419	Total/NA	Water	8260C SIM	
460-196898-5	MW-37_111419	Total/NA	Water	8260C SIM	
460-196898-6	MW-32_111419	Total/NA	Water	8260C SIM	
MB 460-657840/8	Method Blank	Total/NA	Water	8260C SIM	
LCS 460-657840/4	Lab Control Sample	Total/NA	Water	8260C SIM	
LCSD 460-657840/5	Lab Control Sample Dup	Total/NA	Water	8260C SIM	

Analysis Batch: 658195

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-196898-3	TW-16-03_111419	Total/NA	Water	8260C	
460-196898-4	TW-16-04_111419	Total/NA	Water	8260C	
460-196898-5	MW-37_111419	Total/NA	Water	8260C	
460-196898-6	MW-32_111419	Total/NA	Water	8260C	
MB 460-658195/8	Method Blank	Total/NA	Water	8260C	
LCS 460-658195/4	Lab Control Sample	Total/NA	Water	8260C	
LCSD 460-658195/5	Lab Control Sample Dup	Total/NA	Water	8260C	

Analysis Batch: 658634

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-196898-1	TRIP BLANK	Total/NA	Water	8260C	
460-196898-2	PW-16-02_111419	Total/NA	Water	8260C	
MB 460-658634/7	Method Blank	Total/NA	Water	8260C	
LCS 460-658634/3	Lab Control Sample	Total/NA	Water	8260C	
460-196895-B-3 MS	Matrix Spike	Total/NA	Water	8260C	
460-196895-B-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260C	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia On-site

Job ID: 460-196898-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 460-196898-1

Date Collected: 11/14/19 00:00

Matrix: Water

Date Received: 11/18/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	658634	11/27/19 12:39	SZD	TAL EDI

Client Sample ID: PW-16-02_111419

Lab Sample ID: 460-196898-2

Date Collected: 11/14/19 11:57

Matrix: Water

Date Received: 11/18/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	658634	11/27/19 14:15	SZD	TAL EDI
Total/NA	Analysis	8260C SIM		1	657840	11/24/19 05:33	DAS	TAL EDI

Client Sample ID: TW-16-03_111419

Lab Sample ID: 460-196898-3

Date Collected: 11/14/19 11:04

Matrix: Water

Date Received: 11/18/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	658195	11/26/19 05:05	VBP	TAL EDI
Total/NA	Analysis	8260C SIM		1	657840	11/24/19 05:56	DAS	TAL EDI

Client Sample ID: TW-16-04_111419

Lab Sample ID: 460-196898-4

Date Collected: 11/14/19 10:15

Matrix: Water

Date Received: 11/18/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	658195	11/26/19 05:29	VBP	TAL EDI
Total/NA	Analysis	8260C SIM		1	657840	11/24/19 06:19	DAS	TAL EDI

Client Sample ID: MW-37_111419

Lab Sample ID: 460-196898-5

Date Collected: 11/14/19 14:03

Matrix: Water

Date Received: 11/18/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	658195	11/26/19 05:53	VBP	TAL EDI
Total/NA	Analysis	8260C SIM		1	657840	11/24/19 06:43	DAS	TAL EDI

Client Sample ID: MW-32_111419

Lab Sample ID: 460-196898-6

Date Collected: 11/14/19 15:19

Matrix: Water

Date Received: 11/18/19 09:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	658195	11/26/19 06:17	VBP	TAL EDI
Total/NA	Analysis	8260C SIM		1	657840	11/24/19 07:06	DAS	TAL EDI

Laboratory References:

TAL EDI = Eurofins TestAmerica, Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900

Eurofins TestAmerica, Edison

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia On-site

Job ID: 460-196898-1

Laboratory: Eurofins TestAmerica, Edison

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

Authority	Program	Identification Number	Expiration Date
Connecticut	State	PH-0200	09-30-20
DE Haz. Subst. Cleanup Act (HSCA)	State	<cert No.>	12-31-21
Georgia	State	12028 (NJ)	06-30-20
Massachusetts	State Program	M-NJ312	06-30-20
New Jersey	NELAP	12028	06-30-20
New York	NELAP	11452	04-01-20
Pennsylvania	NELAP	68-00522	02-28-20
Rhode Island	State	LAO00132	12-30-19
USDA	US Federal Programs	P330-18-00135	05-03-21

Laboratory: Eurofins TestAmerica, Canton

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

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-20
Connecticut	State	PH-0590	12-31-19
Florida	NELAP	E87225	06-30-20
Georgia	State	4062	02-23-20
Illinois	NELAP	004498	07-31-20
Iowa	State	421	06-01-20
Kansas	NELAP	E-10336	04-30-20
Kentucky (UST)	State	112225	02-23-20
Kentucky (WW)	State	KY98016	12-31-19
Minnesota	NELAP	OH00048	12-31-19
Minnesota (Petrofund)	State Program	3506	07-31-21
New Jersey	NELAP	OH001	06-30-20
New York	NELAP	10975	03-31-20
Ohio VAP	State	CL0024	06-05-21
Oregon	NELAP	4062	02-23-20
Pennsylvania	NELAP	68-00340	08-31-20
Texas	NELAP	T104704517-18-10	08-31-20
USDA	US Federal Programs	P330-16-00404	12-28-19
Virginia	NELAP	010101	09-14-20
Washington	State	C971	01-12-20
West Virginia DEP	State	210	12-31-19

Method Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia On-site

Job ID: 460-196898-1

Method	Method Description	Protocol	Laboratory
8260C	Volatile Organic Compounds by GC/MS	SW846	TAL EDI
8260C SIM	Volatile Organic Compounds (GC/MS)	SW846	TAL EDI
5030C	Purge and Trap	SW846	TAL EDI

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL EDI = Eurofins TestAmerica, Edison, 777 New Durham Road, Edison, NJ 08817, TEL (732)549-3900



Sample Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia On-site

Job ID: 460-196898-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
460-196898-1	TRIP BLANK	Water	11/14/19 00:00	11/18/19 09:30	
460-196898-2	PW-16-02_111419	Water	11/14/19 11:57	11/18/19 09:30	
460-196898-3	TW-16-03_111419	Water	11/14/19 11:04	11/18/19 09:30	
460-196898-4	TW-16-04_111419	Water	11/14/19 10:15	11/18/19 09:30	
460-196898-5	MW-37_111419	Water	11/14/19 14:03	11/18/19 09:30	
460-196898-6	MW-32_111419	Water	11/14/19 15:19	11/18/19 09:30	

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Chain of Custody Record

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

Regulatory program: DW NPDES RCRA Other

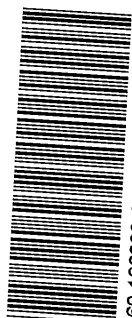
Client Project Manager: Kris Hinskey
Site Contact: Rachel Bielak
Telephone: 248-994-2240
Telephone: 330-497-9396

Company Name: Arcadis
Address: 28550 Cabot Drive, Suite 500
City/State/Zip: Novi, MI, 48377
Phone: 248-994-2240

Project Name: Ford LTP On-Site
Project Number: 30016346.0001B
PO # 30016346.0001B

Sampler Name: Xenia Chen
Method of Shipment/Carrier: 10 day
Shipping/Tracking No:

Sample Identification	Sample Date	Sample Time	Matrix			Composites/Preservatives					TAT if different from below	Analyses						Sample Specific Notes / Special Instructions:				
			Air	Water	Sediment	Solid	Other:	H2SO4	HNO3	HCl		NaOH	ZnAc/NiOH	Unpres	Other:	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B		PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM
TRIP BLANK																						1 TRIP BLANK
PW-16-02-111419	11/14/19	1157	X					X				10 day	X	X	X	X	X	X	X	X	X	3 VOLS for 8260B 3 VOLS for 8260B SIM
TW-16-03-111419	11/14/19	1104	X					X				10 day	X	X	X	X	X	X	X	X	X	
TW-16-04-111419	11/14/19	1015	X					X				10 day	X	X	X	X	X	X	X	X	X	
MW-37-111419	11/14/19	1403	X					X				10 day	X	X	X	X	X	X	X	X	X	
MU-32-111419	11/14/19	1519	X					X				10 day	X	X	X	X	X	X	X	X	X	



460-196898 Chain of Custody

Possible Hazard Identification
 Non-Hazard Irritable Poison B In Irritant Inflammable

Special Instructions/QC Requirements & Comments:
 Relinquished by: [Signature]
 Relinquished by: Ford VI Trailer codes
 Relinquished by: [Signature]
 Relinquished by: [Signature] ETEL-MI
 Relinquished by: [Signature] ETEL-MI

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
[Signature]	Arcadis	11/14/19 1545	Ford VI Trailer Codes	Arcadis	11/14/19 1545
[Signature]	Arcadis	11/14/19 1730	[Signature]	Arcadis	11/14/19 1730
[Signature]	Arcadis	11/14/19 1808	New Gold Storage	Arcadis	11/14/19 1808
[Signature]	ARCADIS	11/15/19 1120	Molly Morrison	ETAL-MI	11/15/19 1020
[Signature]	ETAL-MI	11/15/19 1625	Jenny Myers	ETAL-MI	11/16/19 0730



**Eurofins TestAmerica Edison
Receipt Temperature and pH Log**

Job Number: 196998

Number of Coolers: 1 IR Gun # 11

Cooler Temperatures

	RAW	CORRECTED
Cooler #1:	<u>9.8</u> °C	<u>14</u> °C
Cooler #2:	°C	°C
Cooler #3:	°C	°C
Cooler #4:	°C	°C
Cooler #5:	°C	°C
Cooler #6:	°C	°C
Cooler #7:	°C	°C
Cooler #8:	°C	°C
Cooler #9:	°C	°C

TALS Sample Number	Ammonia (pH<2)	COD (pH<2)	Nitrate Nitrite (pH<2)	Metals* (pH<2)	Hardness (pH<2)	Pest (pH 5-9)	EPH or QAM (pH<2)	Phenols (pH<2)	Sulfide (pH>9)	TKN (pH<2)	TOC (pH<2)	Total Cyanide (pH>12)	Total Phos (pH<2)	Other	Other

If pH adjustments are required record the information below:

Sample No(s), adjusted: _____

Preservative Name/Conc.: _____

Volume of Preservative used (ml): _____

Lot # of Preservative(s): _____

Expiration Date: _____

The appropriate Project Manager and Department Manager should be notified about the samples which were pH adjusted.

* Samples for Metal analysis which are out of compliance must be acidified at least 24 hours prior to analysis.

Initials: WVT Date: 11/19/19

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 460-196898-1

Login Number: 196898

List Number: 1

Creator: Infante, Warleny M

List Source: Eurofins TestAmerica, Edison

Question	Answer	Comment
Radioactivity wasn't checked or is \leq background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	CS#1055323
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <math><6\text{mm}</math> (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

