

ANALYTICAL REPORT

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Laboratory Job ID: 460-196217-1
Client Project/Site: Ford LTP Livonia MI - E203728

For:
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Authorized for release by:
11/22/2019 1:50:36 PM

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The test results in this report meet all 2003 NELAC and 2009 TNI requirements for accredited parameters, exceptions are noted in this report. This report may not be reproduced except in full, and with written approval from the laboratory. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

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.

Table of Contents

Cover Page	1
Table of Contents	2
Definitions/Glossary	3
Case Narrative	4
Detection Summary	5
Client Sample Results	6
Surrogate Summary	9
QC Sample Results	10
QC Association Summary	14
Lab Chronicle	15
Certification Summary	16
Method Summary	17
Sample Summary	18
Chain of Custody	19
Receipt Checklists	21



Definitions/Glossary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203728

Job ID: 460-196217-1

Qualifiers

GC/MS VOA

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

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
▫	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 MI - E203728

Job ID: 460-196217-1

Job ID: 460-196217-1

Laboratory: Eurofins TestAmerica, Edison

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: Ford LTP Livonia MI - E203728

Report Number: 460-196217-1

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 11/9/2019 11:30 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 2.5° C.

VOLATILE ORGANIC COMPOUNDS (GCMS)

Samples Trip Blank (460-196217-1), MW-68_110719 (460-196217-2), MW-70_110719 (460-196217-3), MW-46_110719 (460-196217-4), MW-71_110719 (460-196217-5) and DUP-11 (460-196217-6) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260C. The samples were analyzed on 11/18/2019 and 11/20/2019.

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

VOLATILE ORGANIC COMPOUNDS (GC/MS)

Samples MW-68_110719 (460-196217-2), MW-70_110719 (460-196217-3), MW-46_110719 (460-196217-4), MW-71_110719 (460-196217-5) and DUP-11 (460-196217-6) were analyzed for Volatile organic compounds (GC/MS) in accordance with SW-846 Method 8260C SIM. The samples were analyzed on 11/18/2019.

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 MI - E203728

Job ID: 460-196217-1

Client Sample ID: Trip Blank

Lab Sample ID: 460-196217-1

No Detections.

Client Sample ID: MW-68_110719

Lab Sample ID: 460-196217-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	0.57	J	2.0	0.33	ug/L	1		8260C SIM	Total/NA
cis-1,2-Dichloroethene	40		1.0	0.22	ug/L	1		8260C	Total/NA
trans-1,2-Dichloroethene	5.3		1.0	0.24	ug/L	1		8260C	Total/NA
Trichloroethene	0.50	J	1.0	0.31	ug/L	1		8260C	Total/NA
Vinyl chloride	17		1.0	0.17	ug/L	1		8260C	Total/NA

Client Sample ID: MW-70_110719

Lab Sample ID: 460-196217-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	5.2		2.0	0.33	ug/L	1		8260C SIM	Total/NA
1,1-Dichloroethene	1.5		1.0	0.26	ug/L	1		8260C	Total/NA
cis-1,2-Dichloroethene	300		1.0	0.22	ug/L	1		8260C	Total/NA
trans-1,2-Dichloroethene	3.2		1.0	0.24	ug/L	1		8260C	Total/NA
Vinyl chloride	440		1.0	0.17	ug/L	1		8260C	Total/NA

Client Sample ID: MW-46_110719

Lab Sample ID: 460-196217-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	7.7		2.0	0.33	ug/L	1		8260C SIM	Total/NA
cis-1,2-Dichloroethene	5.5		1.0	0.22	ug/L	1		8260C	Total/NA
trans-1,2-Dichloroethene	0.91	J	1.0	0.24	ug/L	1		8260C	Total/NA
Vinyl chloride	32		1.0	0.17	ug/L	1		8260C	Total/NA

Client Sample ID: MW-71_110719

Lab Sample ID: 460-196217-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	1.3	J	2.0	0.33	ug/L	1		8260C SIM	Total/NA
cis-1,2-Dichloroethene	0.61	J	1.0	0.22	ug/L	1		8260C	Total/NA
Vinyl chloride	0.83	J	1.0	0.17	ug/L	1		8260C	Total/NA

Client Sample ID: DUP-11

Lab Sample ID: 460-196217-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	5.7		2.0	0.33	ug/L	1		8260C SIM	Total/NA
1,1-Dichloroethene	1.5		1.0	0.26	ug/L	1		8260C	Total/NA
cis-1,2-Dichloroethene	300		1.0	0.22	ug/L	1		8260C	Total/NA
trans-1,2-Dichloroethene	3.1		1.0	0.24	ug/L	1		8260C	Total/NA
Trichloroethene	0.34	J	1.0	0.31	ug/L	1		8260C	Total/NA
Vinyl chloride	450		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 MI - E203728

Job ID: 460-196217-1

Client Sample ID: Trip Blank

Date Collected: 11/07/19 14:45

Date Received: 11/09/19 11:30

Lab Sample ID: 460-196217-1

Matrix: Water

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	-		11/18/19 09:57	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.22	ug/L	-		11/18/19 09:57	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L	-		11/18/19 09:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L	-		11/18/19 09:57	1
Trichloroethene	1.0	U	1.0	0.31	ug/L	-		11/18/19 09:57	1
Vinyl chloride	1.0	U	1.0	0.17	ug/L	-		11/18/19 09:57	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	112		74 - 132		11/18/19 09:57	1
Toluene-d8 (Surr)	101		80 - 120		11/18/19 09:57	1
Dibromofluoromethane (Surr)	120		72 - 131		11/18/19 09:57	1
4-Bromofluorobenzene	105		77 - 124		11/18/19 09:57	1

Client Sample ID: MW-68_110719

Date Collected: 11/07/19 10:09

Date Received: 11/09/19 11:30

Lab Sample ID: 460-196217-2

Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	0.57	J	2.0	0.33	ug/L	-		11/18/19 17:07	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	85		72 - 133		11/18/19 17:07	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	-		11/18/19 14:39	1
cis-1,2-Dichloroethene	40		1.0	0.22	ug/L	-		11/18/19 14:39	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L	-		11/18/19 14:39	1
trans-1,2-Dichloroethene	5.3		1.0	0.24	ug/L	-		11/18/19 14:39	1
Trichloroethene	0.50	J	1.0	0.31	ug/L	-		11/18/19 14:39	1
Vinyl chloride	17		1.0	0.17	ug/L	-		11/18/19 14:39	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	113		74 - 132		11/18/19 14:39	1
Toluene-d8 (Surr)	100		80 - 120		11/18/19 14:39	1
Dibromofluoromethane (Surr)	122		72 - 131		11/18/19 14:39	1
4-Bromofluorobenzene	107		77 - 124		11/18/19 14:39	1

Client Sample ID: MW-70_110719

Date Collected: 11/07/19 11:12

Date Received: 11/09/19 11:30

Lab Sample ID: 460-196217-3

Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	5.2		2.0	0.33	ug/L	-		11/18/19 17:30	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	89		72 - 133		11/18/19 17:30	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203728

Job ID: 460-196217-1

Client Sample ID: MW-70_110719

Lab Sample ID: 460-196217-3

Date Collected: 11/07/19 11:12

Matrix: Water

Date Received: 11/09/19 11:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.5		1.0	0.26	ug/L			11/20/19 01:51	1
cis-1,2-Dichloroethene	300		1.0	0.22	ug/L			11/20/19 01:51	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L			11/20/19 01:51	1
trans-1,2-Dichloroethene	3.2		1.0	0.24	ug/L			11/20/19 01:51	1
Trichloroethene	1.0	U	1.0	0.31	ug/L			11/20/19 01:51	1
Vinyl chloride	440		1.0	0.17	ug/L			11/20/19 01:51	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	114		74 - 132		11/20/19 01:51	1
Toluene-d8 (Surr)	97		80 - 120		11/20/19 01:51	1
Dibromofluoromethane (Surr)	121		72 - 131		11/20/19 01:51	1
4-Bromofluorobenzene	102		77 - 124		11/20/19 01:51	1

Client Sample ID: MW-46_110719

Lab Sample ID: 460-196217-4

Date Collected: 11/07/19 13:00

Matrix: Water

Date Received: 11/09/19 11:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	7.7		2.0	0.33	ug/L			11/18/19 17:53	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	89		72 - 133		11/18/19 17:53	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			11/18/19 15:03	1
cis-1,2-Dichloroethene	5.5		1.0	0.22	ug/L			11/18/19 15:03	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L			11/18/19 15:03	1
trans-1,2-Dichloroethene	0.91	J	1.0	0.24	ug/L			11/18/19 15:03	1
Trichloroethene	1.0	U	1.0	0.31	ug/L			11/18/19 15:03	1
Vinyl chloride	32		1.0	0.17	ug/L			11/18/19 15:03	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	113		74 - 132		11/18/19 15:03	1
Toluene-d8 (Surr)	100		80 - 120		11/18/19 15:03	1
Dibromofluoromethane (Surr)	122		72 - 131		11/18/19 15:03	1
4-Bromofluorobenzene	107		77 - 124		11/18/19 15:03	1

Client Sample ID: MW-71_110719

Lab Sample ID: 460-196217-5

Date Collected: 11/07/19 14:45

Matrix: Water

Date Received: 11/09/19 11:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	1.3	J	2.0	0.33	ug/L			11/18/19 18:17	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	87		72 - 133		11/18/19 18:17	1

Client Sample Results

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203728

Job ID: 460-196217-1

Client Sample ID: MW-71_110719

Lab Sample ID: 460-196217-5

Date Collected: 11/07/19 14:45

Matrix: Water

Date Received: 11/09/19 11:30

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			11/18/19 15:26	1
cis-1,2-Dichloroethene	0.61	J	1.0	0.22	ug/L			11/18/19 15:26	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L			11/18/19 15:26	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L			11/18/19 15:26	1
Trichloroethene	1.0	U	1.0	0.31	ug/L			11/18/19 15:26	1
Vinyl chloride	0.83	J	1.0	0.17	ug/L			11/18/19 15:26	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	113		74 - 132		11/18/19 15:26	1
Toluene-d8 (Surr)	101		80 - 120		11/18/19 15:26	1
Dibromofluoromethane (Surr)	122		72 - 131		11/18/19 15:26	1
4-Bromofluorobenzene	107		77 - 124		11/18/19 15:26	1

Client Sample ID: DUP-11

Lab Sample ID: 460-196217-6

Date Collected: 11/07/19 00:00

Matrix: Water

Date Received: 11/09/19 11:30

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	5.7		2.0	0.33	ug/L			11/18/19 18:40	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	88		72 - 133		11/18/19 18:40	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.5		1.0	0.26	ug/L			11/20/19 02:15	1
cis-1,2-Dichloroethene	300		1.0	0.22	ug/L			11/20/19 02:15	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L			11/20/19 02:15	1
trans-1,2-Dichloroethene	3.1		1.0	0.24	ug/L			11/20/19 02:15	1
Trichloroethene	0.34	J	1.0	0.31	ug/L			11/20/19 02:15	1
Vinyl chloride	450		1.0	0.17	ug/L			11/20/19 02:15	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	113		74 - 132		11/20/19 02:15	1
Toluene-d8 (Surr)	97		80 - 120		11/20/19 02:15	1
Dibromofluoromethane (Surr)	119		72 - 131		11/20/19 02:15	1
4-Bromofluorobenzene	103		77 - 124		11/20/19 02:15	1

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203728

Job ID: 460-196217-1

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	DCA (74-132)	TOL (80-120)	DBFM (72-131)	BFB (77-124)
460-196217-1	Trip Blank	112	101	120	105
460-196217-2	MW-68_110719	113	100	122	107
460-196217-3	MW-70_110719	114	97	121	102
460-196217-4	MW-46_110719	113	100	122	107
460-196217-5	MW-71_110719	113	101	122	107
460-196217-6	DUP-11	113	97	119	103
460-196256-A-4 MS	Matrix Spike	111	99	120	107
460-196256-A-4 MSD	Matrix Spike Duplicate	112	101	119	109
LCS 460-656190/5	Lab Control Sample	110	101	119	108
LCS 460-656649/4	Lab Control Sample	111	99	119	106
LCSD 460-656649/5	Lab Control Sample Dup	110	98	120	103
MB 460-656190/9	Method Blank	113	102	122	107
MB 460-656649/8	Method Blank	113	98	120	103

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)
460-196217-2	MW-68_110719	85
460-196217-3	MW-70_110719	89
460-196217-4	MW-46_110719	89
460-196217-5	MW-71_110719	87
460-196217-6	DUP-11	88
LCS 460-656211/3	Lab Control Sample	93
LCSD 460-656211/4	Lab Control Sample Dup	93
MB 460-656211/8	Method Blank	93

Surrogate Legend

BFB = 4-Bromofluorobenzene

QC Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203728

Job ID: 460-196217-1

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

Lab Sample ID: MB 460-656190/9
Matrix: Water
Analysis Batch: 656190

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			11/18/19 09:33	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.22	ug/L			11/18/19 09:33	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L			11/18/19 09:33	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L			11/18/19 09:33	1
Trichloroethene	1.0	U	1.0	0.31	ug/L			11/18/19 09:33	1
Vinyl chloride	1.0	U	1.0	0.17	ug/L			11/18/19 09:33	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	113		74 - 132		11/18/19 09:33	1
Toluene-d8 (Surr)	102		80 - 120		11/18/19 09:33	1
Dibromofluoromethane (Surr)	122		72 - 131		11/18/19 09:33	1
4-Bromofluorobenzene	107		77 - 124		11/18/19 09:33	1

Lab Sample ID: LCS 460-656190/5
Matrix: Water
Analysis Batch: 656190

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	19.6		ug/L		98	74 - 123
cis-1,2-Dichloroethene	20.0	22.3		ug/L		111	80 - 120
Tetrachloroethene	20.0	21.4		ug/L		107	78 - 122
trans-1,2-Dichloroethene	20.0	22.6		ug/L		113	79 - 120
Trichloroethene	20.0	21.8		ug/L		109	77 - 120
Vinyl chloride	20.0	21.1		ug/L		106	62 - 138

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	110		74 - 132
Toluene-d8 (Surr)	101		80 - 120
Dibromofluoromethane (Surr)	119		72 - 131
4-Bromofluorobenzene	108		77 - 124

Lab Sample ID: 460-196256-A-4 MS
Matrix: Water
Analysis Batch: 656190

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	20.0	18.8		ug/L		94	74 - 123
cis-1,2-Dichloroethene	0.41	J	20.0	22.8		ug/L		112	80 - 120
Tetrachloroethene	1.0	U	20.0	21.2		ug/L		106	78 - 122
trans-1,2-Dichloroethene	1.0	U	20.0	23.1		ug/L		116	79 - 120
Trichloroethene	1.0	U	20.0	21.3		ug/L		106	77 - 120
Vinyl chloride	1.0	U	20.0	21.4		ug/L		107	62 - 138

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	111		74 - 132
Toluene-d8 (Surr)	99		80 - 120
Dibromofluoromethane (Surr)	120		72 - 131

QC Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203728

Job ID: 460-196217-1

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

Lab Sample ID: 460-196256-A-4 MS
Matrix: Water
Analysis Batch: 656190

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

Surrogate	MS %Recovery	MS Qualifier	Limits
4-Bromofluorobenzene	107		77 - 124

Lab Sample ID: 460-196256-A-4 MSD
Matrix: Water
Analysis Batch: 656190

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

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	20.0	21.1		ug/L		105	74 - 123	11	30
cis-1,2-Dichloroethene	0.41	J	20.0	22.2		ug/L		109	80 - 120	3	30
Tetrachloroethene	1.0	U	20.0	20.7		ug/L		104	78 - 122	2	30
trans-1,2-Dichloroethene	1.0	U	20.0	21.9		ug/L		110	79 - 120	5	30
Trichloroethene	1.0	U	20.0	20.6		ug/L		103	77 - 120	3	30
Vinyl chloride	1.0	U	20.0	25.4		ug/L		127	62 - 138	17	30

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	112		74 - 132
Toluene-d8 (Surr)	101		80 - 120
Dibromofluoromethane (Surr)	119		72 - 131
4-Bromofluorobenzene	109		77 - 124

Lab Sample ID: MB 460-656649/8
Matrix: Water
Analysis Batch: 656649

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			11/19/19 21:16	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.22	ug/L			11/19/19 21:16	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L			11/19/19 21:16	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L			11/19/19 21:16	1
Trichloroethene	1.0	U	1.0	0.31	ug/L			11/19/19 21:16	1
Vinyl chloride	1.0	U	1.0	0.17	ug/L			11/19/19 21:16	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	113		74 - 132		11/19/19 21:16	1
Toluene-d8 (Surr)	98		80 - 120		11/19/19 21:16	1
Dibromofluoromethane (Surr)	120		72 - 131		11/19/19 21:16	1
4-Bromofluorobenzene	103		77 - 124		11/19/19 21:16	1

Lab Sample ID: LCS 460-656649/4
Matrix: Water
Analysis Batch: 656649

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	18.5		ug/L		92	74 - 123
cis-1,2-Dichloroethene	20.0	22.0		ug/L		110	80 - 120
Tetrachloroethene	20.0	19.9		ug/L		100	78 - 122
trans-1,2-Dichloroethene	20.0	21.8		ug/L		109	79 - 120
Trichloroethene	20.0	20.8		ug/L		104	77 - 120

Eurofins TestAmerica, Edison

QC Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203728

Job ID: 460-196217-1

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

Lab Sample ID: LCS 460-656649/4
Matrix: Water
Analysis Batch: 656649

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Vinyl chloride	20.0	23.2		ug/L		116	62 - 138

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	111		74 - 132
Toluene-d8 (Surr)	99		80 - 120
Dibromofluoromethane (Surr)	119		72 - 131
4-Bromofluorobenzene	106		77 - 124

Lab Sample ID: LCSD 460-656649/5
Matrix: Water
Analysis Batch: 656649

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	23.6		ug/L		118	74 - 123	24	30
cis-1,2-Dichloroethene	20.0	22.1		ug/L		110	80 - 120	0	30
Tetrachloroethene	20.0	20.0		ug/L		100	78 - 122	0	30
trans-1,2-Dichloroethene	20.0	21.9		ug/L		110	79 - 120	1	30
Trichloroethene	20.0	20.3		ug/L		102	77 - 120	2	30
Vinyl chloride	20.0	20.4		ug/L		102	62 - 138	13	30

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	110		74 - 132
Toluene-d8 (Surr)	98		80 - 120
Dibromofluoromethane (Surr)	120		72 - 131
4-Bromofluorobenzene	103		77 - 124

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

Lab Sample ID: MB 460-656211/8
Matrix: Water
Analysis Batch: 656211

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

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			11/18/19 11:17	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	93		72 - 133		11/18/19 11:17	1

Lab Sample ID: LCS 460-656211/3
Matrix: Water
Analysis Batch: 656211

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dioxane	5.00	5.69		ug/L		114	66 - 135

Surrogate	LCS %Recovery	LCS Qualifier	Limits
4-Bromofluorobenzene	93		72 - 133

Eurofins TestAmerica, Edison

QC Sample Results

Client: ARCADIS U.S., Inc.
 Project/Site: Ford LTP Livonia MI - E203728

Job ID: 460-196217-1

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

Lab Sample ID: LCSD 460-656211/4
Matrix: Water
Analysis Batch: 656211

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	6.09		ug/L		122	66 - 135	7	30
Surrogate		LCS	D						
4-Bromofluorobenzene		93							72 - 133

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QC Association Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203728

Job ID: 460-196217-1

GC/MS VOA

Analysis Batch: 656190

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-196217-1	Trip Blank	Total/NA	Water	8260C	
460-196217-2	MW-68_110719	Total/NA	Water	8260C	
460-196217-4	MW-46_110719	Total/NA	Water	8260C	
460-196217-5	MW-71_110719	Total/NA	Water	8260C	
MB 460-656190/9	Method Blank	Total/NA	Water	8260C	
LCS 460-656190/5	Lab Control Sample	Total/NA	Water	8260C	
460-196256-A-4 MS	Matrix Spike	Total/NA	Water	8260C	
460-196256-A-4 MSD	Matrix Spike Duplicate	Total/NA	Water	8260C	

Analysis Batch: 656211

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-196217-2	MW-68_110719	Total/NA	Water	8260C SIM	
460-196217-3	MW-70_110719	Total/NA	Water	8260C SIM	
460-196217-4	MW-46_110719	Total/NA	Water	8260C SIM	
460-196217-5	MW-71_110719	Total/NA	Water	8260C SIM	
460-196217-6	DUP-11	Total/NA	Water	8260C SIM	
MB 460-656211/8	Method Blank	Total/NA	Water	8260C SIM	
LCS 460-656211/3	Lab Control Sample	Total/NA	Water	8260C SIM	
LCSD 460-656211/4	Lab Control Sample Dup	Total/NA	Water	8260C SIM	

Analysis Batch: 656649

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-196217-3	MW-70_110719	Total/NA	Water	8260C	
460-196217-6	DUP-11	Total/NA	Water	8260C	
MB 460-656649/8	Method Blank	Total/NA	Water	8260C	
LCS 460-656649/4	Lab Control Sample	Total/NA	Water	8260C	
LCSD 460-656649/5	Lab Control Sample Dup	Total/NA	Water	8260C	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203728

Job ID: 460-196217-1

Client Sample ID: Trip Blank

Date Collected: 11/07/19 14:45

Date Received: 11/09/19 11:30

Lab Sample ID: 460-196217-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	656190	11/18/19 09:57	CJM	TAL EDI

Client Sample ID: MW-68_110719

Date Collected: 11/07/19 10:09

Date Received: 11/09/19 11:30

Lab Sample ID: 460-196217-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	656190	11/18/19 14:39	CJM	TAL EDI
Total/NA	Analysis	8260C SIM		1	656211	11/18/19 17:07	KLB	TAL EDI

Client Sample ID: MW-70_110719

Date Collected: 11/07/19 11:12

Date Received: 11/09/19 11:30

Lab Sample ID: 460-196217-3

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	656649	11/20/19 01:51	GXY	TAL EDI
Total/NA	Analysis	8260C SIM		1	656211	11/18/19 17:30	KLB	TAL EDI

Client Sample ID: MW-46_110719

Date Collected: 11/07/19 13:00

Date Received: 11/09/19 11:30

Lab Sample ID: 460-196217-4

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	656190	11/18/19 15:03	CJM	TAL EDI
Total/NA	Analysis	8260C SIM		1	656211	11/18/19 17:53	KLB	TAL EDI

Client Sample ID: MW-71_110719

Date Collected: 11/07/19 14:45

Date Received: 11/09/19 11:30

Lab Sample ID: 460-196217-5

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	656190	11/18/19 15:26	CJM	TAL EDI
Total/NA	Analysis	8260C SIM		1	656211	11/18/19 18:17	KLB	TAL EDI

Client Sample ID: DUP-11

Date Collected: 11/07/19 00:00

Date Received: 11/09/19 11:30

Lab Sample ID: 460-196217-6

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	656649	11/20/19 02:15	GXY	TAL EDI
Total/NA	Analysis	8260C SIM		1	656211	11/18/19 18:40	KLB	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 MI - E203728

Job ID: 460-196217-1

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
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 MI - E203728

Job ID: 460-196217-1

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 MI - E203728

Job ID: 460-196217-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
460-196217-1	Trip Blank	Water	11/07/19 14:45	11/09/19 11:30	
460-196217-2	MW-68_110719	Water	11/07/19 10:09	11/09/19 11:30	
460-196217-3	MW-70_110719	Water	11/07/19 11:12	11/09/19 11:30	
460-196217-4	MW-46_110719	Water	11/07/19 13:00	11/09/19 11:30	
460-196217-5	MW-71_110719	Water	11/07/19 14:45	11/09/19 11:30	
460-196217-6	DUP-11	Water	11/07/19 00:00	11/09/19 11:30	

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Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 460-196217-1

Login Number: 196217

List Number: 1

Creator: DiGuardia, Joseph L

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	
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	

