

ANALYTICAL REPORT

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Laboratory Job ID: 240-110950-1
Client Project/Site: Ford LTP Livonia MI - E203728

For:
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Authorized for release by:
4/27/2019 11:05:08 AM

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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 MI - E203728

Job ID: 240-110950-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*	ISTD response or retention time outside acceptable limits
F1	MS and/or MSD Recovery is outside acceptance limits.
F2	MS/MSD RPD exceeds control 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.
X	Surrogate is outside control limits

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
α	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: 240-110950-1

Job ID: 240-110950-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: Ford LTP Livonia MI - E203728

Report Number: 240-110950-1

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, Canton 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 4/13/2019 9:45 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 1.4° C.

VOLATILE ORGANIC COMPOUNDS (GCMS)

Samples HPT-223_20-24_041119 (240-110950-1), HPT-223_15-19_041119 (240-110950-2), HPT-223_10-14_041119 (240-110950-3), HPT-223_5-9_041119 (240-110950-4), TRIP BLANK (240-110950-5) and DUP-04 (240-110950-6) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 04/22/2019.

1,2-Dichloroethane-d4 (Surr) and Dibromofluoromethane (Surr) failed the surrogate recovery criteria high for HPT-223_20-24_041119 (240-110950-1). Refer to the QC report for details.

Samples HPT-223_15-19_041119 (240-110950-2)[10X], HPT-223_10-14_041119 (240-110950-3)[6.67X] and HPT-223_5-9_041119 (240-110950-4)[3.33X] required dilution prior to analysis. The reporting limits have been adjusted accordingly.

There was an MS/MSD analyzed in batch 240-377606 but could not be reported because the associated sample needed reanalyzed in a different batch: HPT-223_10-14_041119 (240-110950-3), HPT-223_5-9_041119 (240-110950-4), TRIP BLANK (240-110950-5) and DUP-04 (240-110950-6).

Surrogate recovery for the following sample was outside the upper control limit: HPT-223_20-24_041119 (240-110950-1). This sample

Case Narrative

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

Job ID: 240-110950-1

Job ID: 240-110950-1 (Continued)

Laboratory: Eurofins TestAmerica, Canton (Continued)

did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

The pH of the sample was greater than 2. The sample was analyzed within the normal 14 day holding time; however, experimental evidence suggests that some aromatic compounds in wastewater samples, notably, Benzene, Toluene, and Ethylbenzene are susceptible to biological degradation if sample is not preserved to a pH of 2: HPT-223_15-19_041119 (240-110950-2).

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

VOLATILE ORGANIC COMPOUNDS (GCMS SIM)

Samples HPT-223_20-24_041119 (240-110950-1), HPT-223_15-19_041119 (240-110950-2), HPT-223_10-14_041119 (240-110950-3), HPT-223_5-9_041119 (240-110950-4) and DUP-04 (240-110950-6) were analyzed for volatile organic compounds (GCMS SIM) in accordance with EPA SW-846 Method 8260B SIM. The samples were analyzed on 04/16/2019.

The pH is greater than 2 for the following sample: HPT-223_15-19_041119 (240-110950-2).

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



Method Summary

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

Job ID: 240-110950-1

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

Protocol References:

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

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396



Sample Summary

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

Job ID: 240-110950-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
240-110950-1	HPT-223_20-24_041119	Water	04/11/19 11:35	04/13/19 09:45
240-110950-2	HPT-223_15-19_041119	Water	04/11/19 11:50	04/13/19 09:45
240-110950-3	HPT-223_10-14_041119	Water	04/11/19 12:05	04/13/19 09:45
240-110950-4	HPT-223_5-9_041119	Water	04/11/19 12:20	04/13/19 09:45
240-110950-5	TRIP BLANK	Water	04/11/19 00:00	04/13/19 09:45
240-110950-6	DUP-04	Water	04/11/19 00:00	04/13/19 09:45

Detection Summary

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

Job ID: 240-110950-1

Client Sample ID: HPT-223_20-24_041119

Lab Sample ID: 240-110950-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Trichloroethene	0.37	J	1.0	0.10	ug/L	1		8260B	Total/NA

Client Sample ID: HPT-223_15-19_041119

Lab Sample ID: 240-110950-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	270		10	1.6	ug/L	10		8260B	Total/NA
trans-1,2-Dichloroethene	120		10	1.9	ug/L	10		8260B	Total/NA
Trichloroethene	42		10	1.0	ug/L	10		8260B	Total/NA

Client Sample ID: HPT-223_10-14_041119

Lab Sample ID: 240-110950-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	10		6.7	1.1	ug/L	6.67		8260B	Total/NA
trans-1,2-Dichloroethene	10		6.7	1.3	ug/L	6.67		8260B	Total/NA
Trichloroethene	130		6.7	0.67	ug/L	6.67		8260B	Total/NA

Client Sample ID: HPT-223_5-9_041119

Lab Sample ID: 240-110950-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	6.5		3.3	0.53	ug/L	3.33		8260B	Total/NA
trans-1,2-Dichloroethene	1.5	J	3.3	0.63	ug/L	3.33		8260B	Total/NA
Trichloroethene	82		3.3	0.33	ug/L	3.33		8260B	Total/NA

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-110950-5

No Detections.

Client Sample ID: DUP-04

Lab Sample ID: 240-110950-6

No Detections.

This Detection Summary does not include radiochemical test results.

Eurofins TestAmerica, Canton

Client Sample Results

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

Job ID: 240-110950-1

Client Sample ID: HPT-223_20-24_041119

Lab Sample ID: 240-110950-1

Date Collected: 04/11/19 11:35

Matrix: Water

Date Received: 04/13/19 09:45

Method: 8260B 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	0.86	ug/L			04/16/19 18:16	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	102		63 - 125		04/16/19 18:16	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			04/22/19 20:08	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			04/22/19 20:08	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			04/22/19 20:08	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			04/22/19 20:08	1
Trichloroethene	0.37	J	1.0	0.10	ug/L			04/22/19 20:08	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			04/22/19 20:08	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	125	X	70 - 121		04/22/19 20:08	1
4-Bromofluorobenzene (Surr)	81		59 - 120		04/22/19 20:08	1
Toluene-d8 (Surr)	104		70 - 123		04/22/19 20:08	1
Dibromofluoromethane (Surr)	145	X	75 - 128		04/22/19 20:08	1

Client Sample Results

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

Job ID: 240-110950-1

Client Sample ID: HPT-223_15-19_041119

Lab Sample ID: 240-110950-2

Date Collected: 04/11/19 11:50

Matrix: Water

Date Received: 04/13/19 09:45

Method: 8260B 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	0.86	ug/L	-		04/16/19 18:42	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	103		63 - 125		04/16/19 18:42	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	10	U	10	1.9	ug/L	-		04/22/19 20:30	10
cis-1,2-Dichloroethene	270		10	1.6	ug/L			04/22/19 20:30	10
Tetrachloroethene	10	U	10	1.5	ug/L			04/22/19 20:30	10
trans-1,2-Dichloroethene	120		10	1.9	ug/L			04/22/19 20:30	10
Trichloroethene	42		10	1.0	ug/L			04/22/19 20:30	10
Vinyl chloride	10	U	10	2.0	ug/L			04/22/19 20:30	10

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	109		70 - 121		04/22/19 20:30	10
4-Bromofluorobenzene (Surr)	70		59 - 120		04/22/19 20:30	10
Toluene-d8 (Surr)	97		70 - 123		04/22/19 20:30	10
Dibromofluoromethane (Surr)	127		75 - 128		04/22/19 20:30	10

Client Sample Results

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

Job ID: 240-110950-1

Client Sample ID: HPT-223_10-14_041119

Lab Sample ID: 240-110950-3

Date Collected: 04/11/19 12:05

Matrix: Water

Date Received: 04/13/19 09:45

Method: 8260B 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	0.86	ug/L	-		04/16/19 19:08	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	106		63 - 125		04/16/19 19:08	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	6.7	U	6.7	1.3	ug/L	-		04/22/19 14:51	6.67
cis-1,2-Dichloroethene	10		6.7	1.1	ug/L			04/22/19 14:51	6.67
Tetrachloroethene	6.7	U	6.7	1.0	ug/L			04/22/19 14:51	6.67
trans-1,2-Dichloroethene	10		6.7	1.3	ug/L			04/22/19 14:51	6.67
Trichloroethene	130		6.7	0.67	ug/L			04/22/19 14:51	6.67
Vinyl chloride	6.7	U	6.7	1.3	ug/L			04/22/19 14:51	6.67

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	86		70 - 121		04/22/19 14:51	6.67
4-Bromofluorobenzene (Surr)	96		59 - 120		04/22/19 14:51	6.67
Toluene-d8 (Surr)	96		70 - 123		04/22/19 14:51	6.67
Dibromofluoromethane (Surr)	88		75 - 128		04/22/19 14:51	6.67

Client Sample Results

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

Job ID: 240-110950-1

Client Sample ID: HPT-223_5-9_041119

Lab Sample ID: 240-110950-4

Date Collected: 04/11/19 12:20

Matrix: Water

Date Received: 04/13/19 09:45

Method: 8260B 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	0.86	ug/L	-		04/16/19 19:33	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	106		63 - 125					04/16/19 19:33	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	3.3	U	3.3	0.63	ug/L	-		04/22/19 15:16	3.33
cis-1,2-Dichloroethene	6.5		3.3	0.53	ug/L			04/22/19 15:16	3.33
Tetrachloroethene	3.3	U	3.3	0.50	ug/L	-		04/22/19 15:16	3.33
trans-1,2-Dichloroethene	1.5	J	3.3	0.63	ug/L			04/22/19 15:16	3.33
Trichloroethene	82		3.3	0.33	ug/L			04/22/19 15:16	3.33
Vinyl chloride	3.3	U	3.3	0.67	ug/L	-		04/22/19 15:16	3.33
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	86		70 - 121					04/22/19 15:16	3.33
4-Bromofluorobenzene (Surr)	101		59 - 120					04/22/19 15:16	3.33
Toluene-d8 (Surr)	99		70 - 123					04/22/19 15:16	3.33
Dibromofluoromethane (Surr)	93		75 - 128					04/22/19 15:16	3.33

Client Sample Results

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

Job ID: 240-110950-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-110950-5

Date Collected: 04/11/19 00:00

Matrix: Water

Date Received: 04/13/19 09:45

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			04/22/19 15:41	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			04/22/19 15:41	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			04/22/19 15:41	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			04/22/19 15:41	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			04/22/19 15:41	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			04/22/19 15:41	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	87		70 - 121		04/22/19 15:41	1
4-Bromofluorobenzene (Surr)	93		59 - 120		04/22/19 15:41	1
Toluene-d8 (Surr)	97		70 - 123		04/22/19 15:41	1
Dibromofluoromethane (Surr)	94		75 - 128		04/22/19 15:41	1

Client Sample Results

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

Job ID: 240-110950-1

Client Sample ID: DUP-04

Lab Sample ID: 240-110950-6

Date Collected: 04/11/19 00:00

Matrix: Water

Date Received: 04/13/19 09:45

Method: 8260B 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	0.86	ug/L			04/16/19 19:59	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	100		63 - 125		04/16/19 19:59	1

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			04/22/19 16:05	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			04/22/19 16:05	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			04/22/19 16:05	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			04/22/19 16:05	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			04/22/19 16:05	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			04/22/19 16:05	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	85		70 - 121		04/22/19 16:05	1
4-Bromofluorobenzene (Surr)	97		59 - 120		04/22/19 16:05	1
Toluene-d8 (Surr)	96		70 - 123		04/22/19 16:05	1
Dibromofluoromethane (Surr)	92		75 - 128		04/22/19 16:05	1

Surrogate Summary

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

Job ID: 240-110950-1

Method: 8260B - Volatile Organic Compounds (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 (70-121)	BFB (59-120)	TOL (70-123)	DBFM (75-128)
240-110950-1	HPT-223_20-24_041119	125 X	81	104	145 X
240-110950-2	HPT-223_15-19_041119	109	70	97	127
240-110950-2 MS	HPT-223_15-19_041119	95	99	107	115
240-110950-2 MSD	HPT-223_15-19_041119	91	98	104	113
240-110950-3	HPT-223_10-14_041119	86	96	96	88
240-110950-4	HPT-223_5-9_041119	86	101	99	93
240-110950-5	TRIP BLANK	87	93	97	94
240-110950-6	DUP-04	85	97	96	92
LCS 240-377602/4	Lab Control Sample	96	101	111	119
LCS 240-377606/4	Lab Control Sample	86	100	92	101
MB 240-377602/35	Method Blank	106	75	96	120
MB 240-377606/6	Method Blank	87	102	95	91

Surrogate Legend

DCA = 1,2-Dichloroethane-d4 (Surr)
 BFB = 4-Bromofluorobenzene (Surr)
 TOL = Toluene-d8 (Surr)
 DBFM = Dibromofluoromethane (Surr)

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

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	DCA
		(63-125)
240-110948-A-3 MS	Matrix Spike	103
240-110948-A-3 MSD	Matrix Spike Duplicate	112
240-110950-1	HPT-223_20-24_041119	102
240-110950-2	HPT-223_15-19_041119	103
240-110950-3	HPT-223_10-14_041119	106
240-110950-4	HPT-223_5-9_041119	106
240-110950-6	DUP-04	100
LCS 240-376688/4	Lab Control Sample	104
MB 240-376688/5	Method Blank	101

Surrogate Legend

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

QC Sample Results

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

Job ID: 240-110950-1

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

Lab Sample ID: MB 240-377602/35
Matrix: Water
Analysis Batch: 377602

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	0.19	ug/L			04/22/19 13:00	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			04/22/19 13:00	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			04/22/19 13:00	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			04/22/19 13:00	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			04/22/19 13:00	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			04/22/19 13:00	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	106		70 - 121		04/22/19 13:00	1
4-Bromofluorobenzene (Surr)	75		59 - 120		04/22/19 13:00	1
Toluene-d8 (Surr)	96		70 - 123		04/22/19 13:00	1
Dibromofluoromethane (Surr)	120		75 - 128		04/22/19 13:00	1

Lab Sample ID: LCS 240-377602/4
Matrix: Water
Analysis Batch: 377602

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	10.0	9.97		ug/L		100	65 - 139
cis-1,2-Dichloroethene	10.0	11.5		ug/L		115	76 - 128
Tetrachloroethene	10.0	11.9		ug/L		119	74 - 130
trans-1,2-Dichloroethene	10.0	12.7		ug/L		127	78 - 133
Trichloroethene	10.0	10.2		ug/L		102	76 - 125
Vinyl chloride	10.0	10.0		ug/L		100	58 - 143

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	96		70 - 121
4-Bromofluorobenzene (Surr)	101		59 - 120
Toluene-d8 (Surr)	111		70 - 123
Dibromofluoromethane (Surr)	119		75 - 128

Lab Sample ID: 240-110950-2 MS
Matrix: Water
Analysis Batch: 377602

Client Sample ID: HPT-223_15-19_041119
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	10	U	100	82.0		ug/L		82	53 - 140
cis-1,2-Dichloroethene	270		100	359		ug/L		90	64 - 130
Tetrachloroethene	10	U	100	84.8		ug/L		85	51 - 136
trans-1,2-Dichloroethene	120		100	232		ug/L		110	68 - 133
Trichloroethene	42		100	120		ug/L		78	55 - 131
Vinyl chloride	10	U	100	104		ug/L		104	43 - 154

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	95		70 - 121
4-Bromofluorobenzene (Surr)	99		59 - 120
Toluene-d8 (Surr)	107		70 - 123

Eurofins TestAmerica, Canton

QC Sample Results

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

Job ID: 240-110950-1

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

Lab Sample ID: 240-110950-2 MS
Matrix: Water
Analysis Batch: 377602

Client Sample ID: HPT-223_15-19_041119
Prep Type: Total/NA

<i>Surrogate</i>	<i>%Recovery</i>	<i>MS MS Qualifier</i>	<i>Limits</i>
<i>Dibromofluoromethane (Surr)</i>	115		75 - 128

Lab Sample ID: 240-110950-2 MSD
Matrix: Water
Analysis Batch: 377602

Client Sample ID: HPT-223_15-19_041119
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	10	U	100	91.6		ug/L		92	53 - 140	11	35
cis-1,2-Dichloroethene	270		100	360		ug/L		91	64 - 130	0	21
Tetrachloroethene	10	U	100	100		ug/L		100	51 - 136	17	23
trans-1,2-Dichloroethene	120		100	239		ug/L		117	68 - 133	3	24
Trichloroethene	42		100	128		ug/L		85	55 - 131	6	23
Vinyl chloride	10	U	100	109		ug/L		109	43 - 154	5	29

<i>Surrogate</i>	<i>%Recovery</i>	<i>MSD MSD Qualifier</i>	<i>Limits</i>
<i>1,2-Dichloroethane-d4 (Surr)</i>	91		70 - 121
<i>4-Bromofluorobenzene (Surr)</i>	98		59 - 120
<i>Toluene-d8 (Surr)</i>	104		70 - 123
<i>Dibromofluoromethane (Surr)</i>	113		75 - 128

Lab Sample ID: MB 240-377606/6
Matrix: Water
Analysis Batch: 377606

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	0.19	ug/L			04/22/19 13:12	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			04/22/19 13:12	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			04/22/19 13:12	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			04/22/19 13:12	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			04/22/19 13:12	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			04/22/19 13:12	1

<i>Surrogate</i>	<i>%Recovery</i>	<i>MB MB Qualifier</i>	<i>Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
<i>1,2-Dichloroethane-d4 (Surr)</i>	87		70 - 121		04/22/19 13:12	1
<i>4-Bromofluorobenzene (Surr)</i>	102		59 - 120		04/22/19 13:12	1
<i>Toluene-d8 (Surr)</i>	95		70 - 123		04/22/19 13:12	1
<i>Dibromofluoromethane (Surr)</i>	91		75 - 128		04/22/19 13:12	1

Lab Sample ID: LCS 240-377606/4
Matrix: Water
Analysis Batch: 377606

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	10.0	10.1		ug/L		101	65 - 139
cis-1,2-Dichloroethene	10.0	10.0		ug/L		100	76 - 128
Tetrachloroethene	10.0	10.1		ug/L		101	74 - 130
trans-1,2-Dichloroethene	10.0	10.0		ug/L		100	78 - 133
Trichloroethene	10.0	9.69		ug/L		97	76 - 125

Eurofins TestAmerica, Canton

QC Sample Results

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

Job ID: 240-110950-1

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

Lab Sample ID: LCS 240-377606/4
Matrix: Water
Analysis Batch: 377606

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Vinyl chloride	10.0	11.0		ug/L		110	58 - 143
Surrogate							
	LCS %Recovery	LCS Qualifier	Limits				
1,2-Dichloroethane-d4 (Surr)	86		70 - 121				
4-Bromofluorobenzene (Surr)	100		59 - 120				
Toluene-d8 (Surr)	92		70 - 123				
Dibromofluoromethane (Surr)	101		75 - 128				

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

Lab Sample ID: MB 240-376688/5
Matrix: Water
Analysis Batch: 376688

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	0.86	ug/L			04/16/19 12:17	1
Surrogate									
	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	101		63 - 125					04/16/19 12:17	1

Lab Sample ID: LCS 240-376688/4
Matrix: Water
Analysis Batch: 376688

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	10.0	10.9		ug/L		109	59 - 131
Surrogate							
	LCS %Recovery	LCS Qualifier	Limits				
1,2-Dichloroethane-d4 (Surr)	104		63 - 125				

Lab Sample ID: 240-110948-A-3 MS
Matrix: Water
Analysis Batch: 376688

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
1,4-Dioxane	2.0	U * F1 F2	10.0	3.85	F1 *	ug/L		38	52 - 129
Surrogate									
	MS %Recovery	MS Qualifier	Limits						
1,2-Dichloroethane-d4 (Surr)	103		63 - 125						

Lab Sample ID: 240-110948-A-3 MSD
Matrix: Water
Analysis Batch: 376688

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
1,4-Dioxane	2.0	U * F1 F2	10.0	3.22	F1 F2 *	ug/L		32	52 - 129	18	13

Eurofins TestAmerica, Canton

QC Sample Results

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

Job ID: 240-110950-1

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

Lab Sample ID: 240-110948-A-3 MSD
Matrix: Water
Analysis Batch: 376688

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

<i>Surrogate</i>	<i>MSD</i> <i>%Recovery</i>	<i>MSD</i> <i>Qualifier</i>	<i>Limits</i>
1,2-Dichloroethane-d4 (Surr)	112		63 - 125

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14

QC Association Summary

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

Job ID: 240-110950-1

GC/MS VOA

Analysis Batch: 376688

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-110950-1	HPT-223_20-24_041119	Total/NA	Water	8260B SIM	
240-110950-2	HPT-223_15-19_041119	Total/NA	Water	8260B SIM	
240-110950-3	HPT-223_10-14_041119	Total/NA	Water	8260B SIM	
240-110950-4	HPT-223_5-9_041119	Total/NA	Water	8260B SIM	
240-110950-6	DUP-04	Total/NA	Water	8260B SIM	
MB 240-376688/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-376688/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-110948-A-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-110948-A-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 377602

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-110950-1	HPT-223_20-24_041119	Total/NA	Water	8260B	
240-110950-2	HPT-223_15-19_041119	Total/NA	Water	8260B	
MB 240-377602/35	Method Blank	Total/NA	Water	8260B	
LCS 240-377602/4	Lab Control Sample	Total/NA	Water	8260B	
240-110950-2 MS	HPT-223_15-19_041119	Total/NA	Water	8260B	
240-110950-2 MSD	HPT-223_15-19_041119	Total/NA	Water	8260B	

Analysis Batch: 377606

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-110950-3	HPT-223_10-14_041119	Total/NA	Water	8260B	
240-110950-4	HPT-223_5-9_041119	Total/NA	Water	8260B	
240-110950-5	TRIP BLANK	Total/NA	Water	8260B	
240-110950-6	DUP-04	Total/NA	Water	8260B	
MB 240-377606/6	Method Blank	Total/NA	Water	8260B	
LCS 240-377606/4	Lab Control Sample	Total/NA	Water	8260B	

Lab Chronicle

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

Job ID: 240-110950-1

Client Sample ID: HPT-223_20-24_041119

Lab Sample ID: 240-110950-1

Date Collected: 04/11/19 11:35

Matrix: Water

Date Received: 04/13/19 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	377602	04/22/19 20:08	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	376688	04/16/19 18:16	SAM	TAL CAN

Client Sample ID: HPT-223_15-19_041119

Lab Sample ID: 240-110950-2

Date Collected: 04/11/19 11:50

Matrix: Water

Date Received: 04/13/19 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		10	377602	04/22/19 20:30	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	376688	04/16/19 18:42	SAM	TAL CAN

Client Sample ID: HPT-223_10-14_041119

Lab Sample ID: 240-110950-3

Date Collected: 04/11/19 12:05

Matrix: Water

Date Received: 04/13/19 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		6.67	377606	04/22/19 14:51	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	376688	04/16/19 19:08	SAM	TAL CAN

Client Sample ID: HPT-223_5-9_041119

Lab Sample ID: 240-110950-4

Date Collected: 04/11/19 12:20

Matrix: Water

Date Received: 04/13/19 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		3.33	377606	04/22/19 15:16	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	376688	04/16/19 19:33	SAM	TAL CAN

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-110950-5

Date Collected: 04/11/19 00:00

Matrix: Water

Date Received: 04/13/19 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	377606	04/22/19 15:41	LRW	TAL CAN

Client Sample ID: DUP-04

Lab Sample ID: 240-110950-6

Date Collected: 04/11/19 00:00

Matrix: Water

Date Received: 04/13/19 09:45

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	377606	04/22/19 16:05	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	376688	04/16/19 19:59	SAM	TAL CAN

Laboratory References:

TAL CAN = Eurofins TestAmerica, Canton, 4101 Shuffel Street NW, North Canton, OH 44720, TEL (330)497-9396

Eurofins TestAmerica, Canton

Accreditation/Certification Summary

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

Job ID: 240-110950-1

Laboratory: Eurofins TestAmerica, Canton

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

Authority	Program	EPA Region	Identification Number	Expiration Date
California	State Program	9	2927	02-23-20
Connecticut	State Program	1	PH-0590	12-31-19
Florida	NELAP	4	E87225	06-30-19
Illinois	NELAP	5	200004	07-31-19
Kansas	NELAP	7	E-10336	04-30-19 *
Kentucky (UST)	State Program	4	58	02-23-20
Kentucky (WW)	State Program	4	98016	12-31-19
Minnesota	NELAP	5	039-999-348	12-31-19 *
Minnesota (Petrofund)	State Program	1	3506	07-31-19
Nevada	State Program	9	OH00048	07-31-19
New Jersey	NELAP	2	OH001	06-30-19
New York	NELAP	2	10975	03-31-20
Ohio VAP	State Program	5	CL0024	09-06-19
Oregon	NELAP	10	4062	02-23-20
Pennsylvania	NELAP	3	68-00340	08-31-19 *
Texas	NELAP	6	T104704517-18-10	08-31-19
USDA	Federal		P330-16-00404	12-28-19
Virginia	NELAP	3	460175	09-14-19
Washington	State Program	10	C971	01-12-20 *
West Virginia DEP	State Program	3	210	12-31-19

* Accreditation/Certification renewal pending - accreditation/certification considered valid.




TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 110950

Client Arcadis Site Name _____ Cooler unpacked by: Ryan Cribler
Cooler Received on 4-13-19 Opened on 4-13-19 9:45
FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other

Receipt After-hours: Drop-off Date/Time _____ Storage Location _____

TestAmerica Cooler # TA Foam Box Client Cooler Box Other _____
Packing material used: Bubble Wrap Foam Plastic Bag None Other _____
COOLANT: Wet Ice Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt See Multiple Cooler Form
IR GUN# IR-8 (CF -0.2 °C) Observed Cooler Temp. 1.6 °C Corrected Cooler Temp. 1.4 °C
IR GUN #36 (CF +0.7°C) Observed Cooler Temp. _____ °C Corrected Cooler Temp. _____ °C
2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1 Yes No
-Were the seals on the outside of the cooler(s) signed & dated? Yes No NA
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)? Yes No NA
-Were tamper/custody seals intact and uncompromised? Yes No NA
3. Shippers' packing slip attached to the cooler(s)? Yes No
4. Did custody papers accompany the sample(s)? Yes No
5. Were the custody papers relinquished & signed in the appropriate place? Yes No
6. Was/were the person(s) who collected the samples clearly identified on the COC? Yes No
7. Did all bottles arrive in good condition (Unbroken)? Yes No
8. Could all bottle labels be reconciled with the COC? Yes No
9. Were correct bottle(s) used for the test(s) indicated? Yes No
10. Sufficient quantity received to perform indicated analyses? Yes No
11. Are these work share samples? Yes No
12. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC984738
13. Were VOAs on the COC? Yes No
14. Were air bubbles >6 mm in any VOA vials? Yes No NA  ← Larger than this.
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # B834001VB Yes No
16. Was a LL Hg or Me Hg trip blank present? Yes No

Tests that are not checked for pH by Receiving:
VOAs
Oil and Grease
TOC

Contacted PM _____ Date _____ by _____ via Verbal Voice Mail Other

Concerning _____

17. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES

Samples processed by: AAA Ryan

18. SAMPLE CONDITION

Sample(s) _____ were received after the recommended holding time had expired.
Sample(s) _____ were received in a broken container.
Sample(s) _____ were received with bubble >6 mm in diameter. (Notify PM)

19. SAMPLE PRESERVATION

Sample(s) _____ were further preserved in the laboratory.
Time preserved: _____ Preservative(s) added/Lot number(s): _____

VOA Sample Preservation - Date/Time VOAs Frozen: _____