

ANALYTICAL REPORT

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Laboratory Job ID: 460-196848-1
Client Project/Site: Ford LTP Livonia Off-Site

For:
ARCADIS U.S., Inc.
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Attn: Kristoffer Hinskey



Authorized for release by:
12/2/2019 6:20:53 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.



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Definitions/Glossary

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

Job ID: 460-196848-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
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 Off-Site

Job ID: 460-196848-1

Job ID: 460-196848-1

Laboratory: Eurofins TestAmerica, Edison

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: Ford LTP Livonia Off-Site

Report Number: 460-196848-1

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 11/15/2019 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.6° C and 2.0° C.

VOLATILE ORGANIC COMPOUNDS (GCMS)

Samples Trip Blank (460-196848-1) and MW-164S_111319 (460-196848-2) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260C. The samples were analyzed on 11/23/2019 and 11/24/2019.

The continuing calibration verification (CCV) associated with batch 460-657905 recovered above the upper control limit for Vinyl chloride. The samples associated with this CCV were non-detects for the affected analyte; therefore, the data have been reported.

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-164S_111319 (460-196848-2) were analyzed for Volatile organic compounds (GC/MS) in accordance with SW-846 Method 8260C SIM. The samples were analyzed on 11/22/2019.

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 Off-Site

Job ID: 460-196848-1

Client Sample ID: Trip Blank

Lab Sample ID: 460-196848-1

No Detections.

Client Sample ID: MW-164S_111319

Lab Sample ID: 460-196848-2

No Detections.

- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15

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 Off-Site

Job ID: 460-196848-1

Client Sample ID: Trip Blank

Lab Sample ID: 460-196848-1

Date Collected: 11/13/19 00:00

Matrix: Water

Date Received: 11/15/19 10:00

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	-		11/24/19 14:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.22	ug/L	-		11/24/19 14:44	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L	-		11/24/19 14:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L	-		11/24/19 14:44	1
Trichloroethene	1.0	U	1.0	0.31	ug/L	-		11/24/19 14:44	1
Vinyl chloride	1.0	U	1.0	0.17	ug/L	-		11/24/19 14:44	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	102		74 - 132		11/24/19 14:44	1
Toluene-d8 (Surr)	107		80 - 120		11/24/19 14:44	1
Dibromofluoromethane (Surr)	107		72 - 131		11/24/19 14:44	1
4-Bromofluorobenzene	104		77 - 124		11/24/19 14:44	1

Client Sample ID: MW-164S_111319

Lab Sample ID: 460-196848-2

Date Collected: 11/13/19 16:03

Matrix: Water

Date Received: 11/15/19 10:00

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	-		11/22/19 14:54	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	90		72 - 133		11/22/19 14:54	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	-		11/23/19 23:32	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.22	ug/L	-		11/23/19 23:32	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L	-		11/23/19 23:32	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L	-		11/23/19 23:32	1
Trichloroethene	1.0	U	1.0	0.31	ug/L	-		11/23/19 23:32	1
Vinyl chloride	1.0	U	1.0	0.17	ug/L	-		11/23/19 23:32	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	80		74 - 132		11/23/19 23:32	1
Toluene-d8 (Surr)	82		80 - 120		11/23/19 23:32	1
Dibromofluoromethane (Surr)	82		72 - 131		11/23/19 23:32	1
4-Bromofluorobenzene	81		77 - 124		11/23/19 23:32	1

Surrogate Summary

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

Job ID: 460-196848-1

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)
460-196848-1	Trip Blank	102	107	107	104
460-196848-2	MW-164S_111319	80	82	82	81
LCS 460-657765/15	Lab Control Sample	79	83	82	82
LCS 460-657905/3	Lab Control Sample	96	102	103	99
LCSD 460-657765/16	Lab Control Sample Dup	95	103	99	100
LCSD 460-657905/4	Lab Control Sample Dup	79	86	88	85
MB 460-657765/10	Method Blank	81	83	83	83
MB 460-657905/8	Method Blank	98	105	107	99

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)
460-196848-2	MW-164S_111319	90
LCS 460-657367/3	Lab Control Sample	93
LCSD 460-657367/4	Lab Control Sample Dup	92
MB 460-657367/8	Method Blank	93

Surrogate Legend

BFB = 4-Bromofluorobenzene

QC Sample Results

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

Job ID: 460-196848-1

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

Lab Sample ID: MB 460-657765/10
Matrix: Water
Analysis Batch: 657765

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			11/23/19 19:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.22	ug/L			11/23/19 19:40	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L			11/23/19 19:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L			11/23/19 19:40	1
Trichloroethene	1.0	U	1.0	0.31	ug/L			11/23/19 19:40	1
Vinyl chloride	1.0	U	1.0	0.17	ug/L			11/23/19 19:40	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
1,2-Dichloroethane-d4 (Surr)	81		74 - 132		11/23/19 19:40	1
Toluene-d8 (Surr)	83		80 - 120		11/23/19 19:40	1
Dibromofluoromethane (Surr)	83		72 - 131		11/23/19 19:40	1
4-Bromofluorobenzene	83		77 - 124		11/23/19 19:40	1

Lab Sample ID: LCS 460-657765/15
Matrix: Water
Analysis Batch: 657765

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	16.2		ug/L		81	74 - 123
cis-1,2-Dichloroethene	20.0	18.7		ug/L		94	80 - 120
Tetrachloroethene	20.0	17.4		ug/L		87	78 - 122
trans-1,2-Dichloroethene	20.0	17.7		ug/L		88	79 - 120
Trichloroethene	20.0	18.1		ug/L		90	77 - 120
Vinyl chloride	20.0	16.7		ug/L		84	62 - 138

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	79		74 - 132
Toluene-d8 (Surr)	83		80 - 120
Dibromofluoromethane (Surr)	82		72 - 131
4-Bromofluorobenzene	82		77 - 124

Lab Sample ID: LCSD 460-657765/16
Matrix: Water
Analysis Batch: 657765

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

Analyte	Spike Added	LCSD LCSD		Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
		Result	Qualifier						
1,1-Dichloroethene	20.0	18.0		ug/L		90	74 - 123	11	30
cis-1,2-Dichloroethene	20.0	21.6		ug/L		108	80 - 120	14	30
Tetrachloroethene	20.0	21.2		ug/L		106	78 - 122	19	30
trans-1,2-Dichloroethene	20.0	20.2		ug/L		101	79 - 120	13	30
Trichloroethene	20.0	20.9		ug/L		104	77 - 120	14	30
Vinyl chloride	20.0	18.7		ug/L		94	62 - 138	11	30

Surrogate	LCSD LCSD		Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	95		74 - 132
Toluene-d8 (Surr)	103		80 - 120
Dibromofluoromethane (Surr)	99		72 - 131

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QC Sample Results

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

Job ID: 460-196848-1

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

Lab Sample ID: LCSD 460-657765/16
Matrix: Water
Analysis Batch: 657765

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

Surrogate	LCSD LCSD		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene	100		77 - 124

Lab Sample ID: MB 460-657905/8
Matrix: Water
Analysis Batch: 657905

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			11/24/19 12:31	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.22	ug/L			11/24/19 12:31	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L			11/24/19 12:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L			11/24/19 12:31	1
Trichloroethene	1.0	U	1.0	0.31	ug/L			11/24/19 12:31	1
Vinyl chloride	1.0	U	1.0	0.17	ug/L			11/24/19 12:31	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
1,2-Dichloroethane-d4 (Surr)	98		74 - 132		11/24/19 12:31	1
Toluene-d8 (Surr)	105		80 - 120		11/24/19 12:31	1
Dibromofluoromethane (Surr)	107		72 - 131		11/24/19 12:31	1
4-Bromofluorobenzene	99		77 - 124		11/24/19 12:31	1

Lab Sample ID: LCS 460-657905/3
Matrix: Water
Analysis Batch: 657905

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	21.2		ug/L		106	74 - 123
cis-1,2-Dichloroethene	20.0	18.9		ug/L		94	80 - 120
Tetrachloroethene	20.0	21.0		ug/L		105	78 - 122
trans-1,2-Dichloroethene	20.0	20.5		ug/L		102	79 - 120
Trichloroethene	20.0	20.1		ug/L		100	77 - 120
Vinyl chloride	20.0	26.4		ug/L		132	62 - 138

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	96		74 - 132
Toluene-d8 (Surr)	102		80 - 120
Dibromofluoromethane (Surr)	103		72 - 131
4-Bromofluorobenzene	99		77 - 124

Lab Sample ID: LCSD 460-657905/4
Matrix: Water
Analysis Batch: 657905

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

Analyte	Spike Added	LCSD LCSD		Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
		Result	Qualifier						
1,1-Dichloroethene	20.0	20.4		ug/L		102	74 - 123	4	30
cis-1,2-Dichloroethene	20.0	19.8		ug/L		99	80 - 120	5	30
Tetrachloroethene	20.0	19.9		ug/L		99	78 - 122	5	30
trans-1,2-Dichloroethene	20.0	20.7		ug/L		103	79 - 120	1	30
Trichloroethene	20.0	20.1		ug/L		101	77 - 120	0	30

Eurofins TestAmerica, Edison

QC Sample Results

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

Job ID: 460-196848-1

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

Lab Sample ID: LCSD 460-657905/4
Matrix: Water
Analysis Batch: 657905

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
Vinyl chloride	20.0	27.3		ug/L		137	62 - 138	3	30
Surrogate									
	%Recovery	LCSD Qualifier	Limits						
1,2-Dichloroethane-d4 (Surr)	79		74 - 132						
Toluene-d8 (Surr)	86		80 - 120						
Dibromofluoromethane (Surr)	88		72 - 131						
4-Bromofluorobenzene	85		77 - 124						

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

Lab Sample ID: MB 460-657367/8
Matrix: Water
Analysis Batch: 657367

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			11/22/19 11:32	1
Surrogate									
	%Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	93		72 - 133					11/22/19 11:32	1

Lab Sample ID: LCS 460-657367/3
Matrix: Water
Analysis Batch: 657367

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	4.16		ug/L		83	66 - 135		
Surrogate									
	%Recovery	LCS Qualifier	Limits						
4-Bromofluorobenzene	93		72 - 133						

Lab Sample ID: LCSD 460-657367/4
Matrix: Water
Analysis Batch: 657367

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	4.21		ug/L		84	66 - 135	1	30
Surrogate									
	%Recovery	LCSD Qualifier	Limits						
4-Bromofluorobenzene	92		72 - 133						

QC Association Summary

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

Job ID: 460-196848-1

GC/MS VOA

Analysis Batch: 657367

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-196848-2	MW-164S_111319	Total/NA	Water	8260C SIM	
MB 460-657367/8	Method Blank	Total/NA	Water	8260C SIM	
LCS 460-657367/3	Lab Control Sample	Total/NA	Water	8260C SIM	
LCSD 460-657367/4	Lab Control Sample Dup	Total/NA	Water	8260C SIM	

Analysis Batch: 657765

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-196848-2	MW-164S_111319	Total/NA	Water	8260C	
MB 460-657765/10	Method Blank	Total/NA	Water	8260C	
LCS 460-657765/15	Lab Control Sample	Total/NA	Water	8260C	
LCSD 460-657765/16	Lab Control Sample Dup	Total/NA	Water	8260C	

Analysis Batch: 657905

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-196848-1	Trip Blank	Total/NA	Water	8260C	
MB 460-657905/8	Method Blank	Total/NA	Water	8260C	
LCS 460-657905/3	Lab Control Sample	Total/NA	Water	8260C	
LCSD 460-657905/4	Lab Control Sample Dup	Total/NA	Water	8260C	

Lab Chronicle

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

Job ID: 460-196848-1

Client Sample ID: Trip Blank

Date Collected: 11/13/19 00:00

Date Received: 11/15/19 10:00

Lab Sample ID: 460-196848-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	657905	11/24/19 14:44	VZD	TAL EDI

Client Sample ID: MW-164S_111319

Date Collected: 11/13/19 16:03

Date Received: 11/15/19 10:00

Lab Sample ID: 460-196848-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	657765	11/23/19 23:32	VBP	TAL EDI
Total/NA	Analysis	8260C SIM		1	657367	11/22/19 14:54	SZD	TAL EDI

Laboratory References:

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

Accreditation/Certification Summary

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

Job ID: 460-196848-1

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 Off-Site

Job ID: 460-196848-1

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 Off-Site

Job ID: 460-196848-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
460-196848-1	Trip Blank	Water	11/13/19 00:00	11/15/19 10:00	
460-196848-2	MW-164S_111319	Water	11/13/19 16:03	11/15/19 10:00	

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MICHIGAN

190

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

Chain of Custody Record

Client Contact

Regulatory program:

DW

NPDES

RCRA

Other

TestAmerica Laboratories, Inc.

Company Name: Arcadis

Address: 2850 Cabot Drive, Suite 500

City/State/Zip: Novi, MI, 48317

Phone: 248-994-2240

Project Name: Ford LTP Off-Site

Project Number: 30016346.0002B

PO # 30016346.0002B

Client Project Manager: Kris Hinskey

Telephone: 248-994-2240

Email: kris@hinkey.com

Sampler Name: *Madison Bender*

Method of Shipment/Carrier:

Shipping/Tracking No:

Site Contact: Rachel Bielak

Telephone: 248-946-6331

Lab Contact: Mike DelMonte

Telephone: 330-497-9396

ANALYSES

Sample ID	Sample Date	Sample Time	Matrix								H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	TAT if different from below	Retention Time		1,1-DCE 8260B	cis-1,2-DCE 8260B	Trans-1,2-DCE 8260B	PCE 8260B	TCE 8260B	Vinyl Chloride 8260B	1,4-Dioxane 8260B SIM	Sample Specific Notes / Special Instructions						
			Air	Aqueous	Sediment	Solid	Other:	10 day	1 week	2 days									1 day															
TRIP BLANK			<input checked="" type="checkbox"/>																															
MW-164S_111319	11/21/19	1603	<input checked="" type="checkbox"/>																														6 VOA	



Possible Hazard Identification
 Harmful Irritant Poison B Unknown

Special Instructions/QC Requirements & Comments:

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
 Return to Client Disposal By Lab Archive For _____ Months

Submit all results through Cadena at jim.tomalia@cadenalabs.com. Cadena #E203631

Level IV Reporting requested.

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:	Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:
<i>[Signature]</i>	Arcadis	11/13/19 1705	<i>[Signature]</i>	Arcadis	11/13/19 1800	<i>[Signature]</i>	Arcadis	11/13/19 1800	<i>[Signature]</i>	Arcadis	11/13/19 1800
<i>[Signature]</i>	Arcadis	11/13/19 1800	<i>[Signature]</i>	Arcadis	11/13/19 1800	<i>[Signature]</i>	Arcadis	11/13/19 1800	<i>[Signature]</i>	Arcadis	11/13/19 1800
LAUREL BIELAK	ARCADIS	11/14/19 1335	<i>[Signature]</i>	ETA	11/14/19 1350	<i>[Signature]</i>	ETA	11/14/19 1350	<i>[Signature]</i>	ETA	11/14/19 1350

ETA 11-14-19 1415

Kyara Knowlde ETA 11/15/19 1000

Viate dex seal-1055303

IR# 22

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Eurofins TestAmerica Edison
Receipt Temperature and pH Log

Job Number:

196848

Number of Coolers:

2

IR Gun #

11

Cooler Temperatures

Cooler #	RAW	CORRECTED	Cooler #	RAW	CORRECTED	Cooler #	RAW	CORRECTED
	°C	°C		°C	°C		°C	°C
Cooler #1:	<u>13</u>	<u>16</u>	Cooler #4:			Cooler #7:		
Cooler #2:	<u>17</u>	<u>20</u>	Cooler #5:			Cooler #8:		
Cooler #3:			Cooler #6:			Cooler #9:		

TALS Sample Number	(pH<2)	(pH<2)	(pH<2)	(pH<2)	(pH<2)	(pH 5-9)	(pH<2)	(pH<2)	(pH<2)	(pH>9)	(pH<2)	(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: _____
Initials: EL
Date: 11/15/19

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.

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 460-196848-1

Login Number: 196848

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	



DATA VERIFICATION REPORT



December 02, 2019

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

CADENA project ID: E203631
Project: Ford Livonia Transmission Project - OFF-SITE - Soil Gas and Groundwater
Project number: 30016346.0002B
Event Specific Scope of Work References: Sample COC
Laboratory: TestAmerica - Edison
Laboratory submittal: 196848-1
Sample date: 2019-11-13
Report received by CADENA: 2019-12-02
Initial Data Verification completed by CADENA: 2019-12-02
Number of Samples:2
Sample Matrices:Water
Test Categories:GCMS VOC

Please see attached criteria report or sample result/qualified analytical result summary for qualifier flags assigned to sample data.

The following minor QC exceptions or missing information were noted:

GCMS VOC QC batch CCV response outliers as noted in the laboratory submittal case narrative were not used to qualify client sample results as part of this level 2 data package.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, LCS/LCD RPD, Blank Contamination and Hold Time Exception were reviewed as part of our verification.

Data verification for the report specified above was completed using the Ford Motor Company Environmental Laboratory Technical Specification, the CADENA Standard Operating Procedure for the Verification of Environmental Analytical Data and the associated analytical methods as references for evaluating the batch QC, sample data and report content. The EPA National Functional Guidelines for validating organic and inorganic data were used as guidance when addressing out of control QC results and the associated data qualifiers.

The definitions of the qualifiers used for this data package are defined in the analytical report. CADENA valid qualifiers are defined in the table below. To view and download a PDF copy of the laboratory analytical report access the CADENA CLMS at <http://clms.cadenaco.com/index.cfm>.

Please contact me if you have any questions.

Sincerely,

Jim Tomalia

Project Scientist

CADENA Valid Qualifiers

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

SAMPLING AND ANALYSIS SUMMARY

CADENA Project ID: E203631

Laboratory: TestAmerica-Edison

Laboratory Submittal: 196848-1

Lab Sample ID	Sample ID	Collection Date (mm/yy/dd)	Collection Time (hh:mm:ss)	GCMS VOC Volatiles	GCMS VOC SIM	Comment
4601968481	Trip Blank	11/13/2019	12:00:00	X		
4601968482	MW-164S_111319	11/13/2019	4:03:00	X	X	

Analytical Results Summary

Reportable Results Only

CADENA Project ID: E203631

Laboratory: TestAmerica - Edison

Laboratory Submittal: 196848-1

Sample Name: Trip Blank MW-164S_111319
Lab Sample ID: 4601968481 4601968482
Sample Date: 11/13/2019 11/13/2019

Analyte	Cas No.	Report		Units	Valid Qualifier	Report		Units	Valid Qualifier	
		Result	Limit			Result	Limit			
GC/MS VOC										
<u>OSW-8260C</u>										
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	---	ND	1.0	ug/l	---	
Tetrachloroethene	127-18-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	---	ND	1.0	ug/l	---	
Trichloroethene	79-01-6	ND	1.0	ug/l	---	ND	1.0	ug/l	---	
Vinyl chloride	75-01-4	ND	1.0	ug/l	---	ND	1.0	ug/l	---	
GC/MS SVOC										
<u>OSW-8260CSIM</u>										
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	

ANALYTICAL REPORT

Eurofins TestAmerica, Edison
777 New Durham Road
Edison, NJ 08817
Tel: (732)549-3900

Laboratory Job ID: 460-196848-1
Client Project/Site: Ford LTP Livonia Off-Site

For:
ARCADIS U.S., Inc.
28550 Cabot Drive
Suite 500
Novi, Michigan 48377

Attn: Kristoffer Hinskey



Authorized for release by:
12/2/2019 6:20:53 PM

Michael DelMonico, Project Manager I
(330)497-9396
michael.delmonico@testamericainc.com

LINKS

Review your project
results through
TotalAccess

Have a Question?



Visit us at:
www.testamericainc.com

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.



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Definitions/Glossary

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

Job ID: 460-196848-1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
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.
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 Off-Site

Job ID: 460-196848-1

Job ID: 460-196848-1

Laboratory: Eurofins TestAmerica, Edison

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: Ford LTP Livonia Off-Site

Report Number: 460-196848-1

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 11/15/2019 10:00 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 2 coolers at receipt time were 1.6° C and 2.0° C.

VOLATILE ORGANIC COMPOUNDS (GCMS)

Samples Trip Blank (460-196848-1) and MW-164S_111319 (460-196848-2) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260C. The samples were analyzed on 11/23/2019 and 11/24/2019.

The continuing calibration verification (CCV) associated with batch 460-657905 recovered above the upper control limit for Vinyl chloride. The samples associated with this CCV were non-detects for the affected analyte; therefore, the data have been reported.

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-164S_111319 (460-196848-2) were analyzed for Volatile organic compounds (GC/MS) in accordance with SW-846 Method 8260C SIM. The samples were analyzed on 11/22/2019.

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 Off-Site

Job ID: 460-196848-1

Client Sample ID: Trip Blank

Lab Sample ID: 460-196848-1

No Detections.

Client Sample ID: MW-164S_111319

Lab Sample ID: 460-196848-2

No Detections.

- 1
- 2
- 3
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- 6
- 7
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- 10
- 11
- 12
- 13
- 14
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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 Off-Site

Job ID: 460-196848-1

Client Sample ID: Trip Blank

Lab Sample ID: 460-196848-1

Date Collected: 11/13/19 00:00

Matrix: Water

Date Received: 11/15/19 10:00

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	-		11/24/19 14:44	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.22	ug/L	-		11/24/19 14:44	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L	-		11/24/19 14:44	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L	-		11/24/19 14:44	1
Trichloroethene	1.0	U	1.0	0.31	ug/L	-		11/24/19 14:44	1
Vinyl chloride	1.0	U	1.0	0.17	ug/L	-		11/24/19 14:44	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	102		74 - 132		11/24/19 14:44	1
Toluene-d8 (Surr)	107		80 - 120		11/24/19 14:44	1
Dibromofluoromethane (Surr)	107		72 - 131		11/24/19 14:44	1
4-Bromofluorobenzene	104		77 - 124		11/24/19 14:44	1

Client Sample ID: MW-164S_111319

Lab Sample ID: 460-196848-2

Date Collected: 11/13/19 16:03

Matrix: Water

Date Received: 11/15/19 10:00

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	-		11/22/19 14:54	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	90		72 - 133		11/22/19 14:54	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	-		11/23/19 23:32	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.22	ug/L	-		11/23/19 23:32	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L	-		11/23/19 23:32	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L	-		11/23/19 23:32	1
Trichloroethene	1.0	U	1.0	0.31	ug/L	-		11/23/19 23:32	1
Vinyl chloride	1.0	U	1.0	0.17	ug/L	-		11/23/19 23:32	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	80		74 - 132		11/23/19 23:32	1
Toluene-d8 (Surr)	82		80 - 120		11/23/19 23:32	1
Dibromofluoromethane (Surr)	82		72 - 131		11/23/19 23:32	1
4-Bromofluorobenzene	81		77 - 124		11/23/19 23:32	1

Surrogate Summary

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

Job ID: 460-196848-1

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)
460-196848-1	Trip Blank	102	107	107	104
460-196848-2	MW-164S_111319	80	82	82	81
LCS 460-657765/15	Lab Control Sample	79	83	82	82
LCS 460-657905/3	Lab Control Sample	96	102	103	99
LCSD 460-657765/16	Lab Control Sample Dup	95	103	99	100
LCSD 460-657905/4	Lab Control Sample Dup	79	86	88	85
MB 460-657765/10	Method Blank	81	83	83	83
MB 460-657905/8	Method Blank	98	105	107	99

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)
460-196848-2	MW-164S_111319	90
LCS 460-657367/3	Lab Control Sample	93
LCSD 460-657367/4	Lab Control Sample Dup	92
MB 460-657367/8	Method Blank	93

Surrogate Legend

BFB = 4-Bromofluorobenzene

QC Sample Results

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

Job ID: 460-196848-1

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

Lab Sample ID: MB 460-657765/10
Matrix: Water
Analysis Batch: 657765

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			11/23/19 19:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.22	ug/L			11/23/19 19:40	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L			11/23/19 19:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L			11/23/19 19:40	1
Trichloroethene	1.0	U	1.0	0.31	ug/L			11/23/19 19:40	1
Vinyl chloride	1.0	U	1.0	0.17	ug/L			11/23/19 19:40	1

Surrogate	MB	MB	Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
1,2-Dichloroethane-d4 (Surr)	81		74 - 132		11/23/19 19:40	1
Toluene-d8 (Surr)	83		80 - 120		11/23/19 19:40	1
Dibromofluoromethane (Surr)	83		72 - 131		11/23/19 19:40	1
4-Bromofluorobenzene	83		77 - 124		11/23/19 19:40	1

Lab Sample ID: LCS 460-657765/15
Matrix: Water
Analysis Batch: 657765

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	16.2		ug/L		81	74 - 123
cis-1,2-Dichloroethene	20.0	18.7		ug/L		94	80 - 120
Tetrachloroethene	20.0	17.4		ug/L		87	78 - 122
trans-1,2-Dichloroethene	20.0	17.7		ug/L		88	79 - 120
Trichloroethene	20.0	18.1		ug/L		90	77 - 120
Vinyl chloride	20.0	16.7		ug/L		84	62 - 138

Surrogate	LCS	LCS	Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	79		74 - 132
Toluene-d8 (Surr)	83		80 - 120
Dibromofluoromethane (Surr)	82		72 - 131
4-Bromofluorobenzene	82		77 - 124

Lab Sample ID: LCSD 460-657765/16
Matrix: Water
Analysis Batch: 657765

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

Analyte	Spike Added	LCSD	LCSD	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
		Result	Qualifier						
1,1-Dichloroethene	20.0	18.0		ug/L		90	74 - 123	11	30
cis-1,2-Dichloroethene	20.0	21.6		ug/L		108	80 - 120	14	30
Tetrachloroethene	20.0	21.2		ug/L		106	78 - 122	19	30
trans-1,2-Dichloroethene	20.0	20.2		ug/L		101	79 - 120	13	30
Trichloroethene	20.0	20.9		ug/L		104	77 - 120	14	30
Vinyl chloride	20.0	18.7		ug/L		94	62 - 138	11	30

Surrogate	LCSD	LCSD	Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	95		74 - 132
Toluene-d8 (Surr)	103		80 - 120
Dibromofluoromethane (Surr)	99		72 - 131

Eurofins TestAmerica, Edison

QC Sample Results

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

Job ID: 460-196848-1

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

Lab Sample ID: LCSD 460-657765/16
Matrix: Water
Analysis Batch: 657765

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

Surrogate	LCSD LCSD		Limits
	%Recovery	Qualifier	
4-Bromofluorobenzene	100		77 - 124

Lab Sample ID: MB 460-657905/8
Matrix: Water
Analysis Batch: 657905

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			11/24/19 12:31	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.22	ug/L			11/24/19 12:31	1
Tetrachloroethene	1.0	U	1.0	0.25	ug/L			11/24/19 12:31	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.24	ug/L			11/24/19 12:31	1
Trichloroethene	1.0	U	1.0	0.31	ug/L			11/24/19 12:31	1
Vinyl chloride	1.0	U	1.0	0.17	ug/L			11/24/19 12:31	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
1,2-Dichloroethane-d4 (Surr)	98		74 - 132		11/24/19 12:31	1
Toluene-d8 (Surr)	105		80 - 120		11/24/19 12:31	1
Dibromofluoromethane (Surr)	107		72 - 131		11/24/19 12:31	1
4-Bromofluorobenzene	99		77 - 124		11/24/19 12:31	1

Lab Sample ID: LCS 460-657905/3
Matrix: Water
Analysis Batch: 657905

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	21.2		ug/L		106	74 - 123
cis-1,2-Dichloroethene	20.0	18.9		ug/L		94	80 - 120
Tetrachloroethene	20.0	21.0		ug/L		105	78 - 122
trans-1,2-Dichloroethene	20.0	20.5		ug/L		102	79 - 120
Trichloroethene	20.0	20.1		ug/L		100	77 - 120
Vinyl chloride	20.0	26.4		ug/L		132	62 - 138

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	96		74 - 132
Toluene-d8 (Surr)	102		80 - 120
Dibromofluoromethane (Surr)	103		72 - 131
4-Bromofluorobenzene	99		77 - 124

Lab Sample ID: LCSD 460-657905/4
Matrix: Water
Analysis Batch: 657905

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

Analyte	Spike Added	LCSD LCSD		Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
		Result	Qualifier						
1,1-Dichloroethene	20.0	20.4		ug/L		102	74 - 123	4	30
cis-1,2-Dichloroethene	20.0	19.8		ug/L		99	80 - 120	5	30
Tetrachloroethene	20.0	19.9		ug/L		99	78 - 122	5	30
trans-1,2-Dichloroethene	20.0	20.7		ug/L		103	79 - 120	1	30
Trichloroethene	20.0	20.1		ug/L		101	77 - 120	0	30

Eurofins TestAmerica, Edison

QC Sample Results

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

Job ID: 460-196848-1

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

Lab Sample ID: LCSD 460-657905/4
Matrix: Water
Analysis Batch: 657905

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
Vinyl chloride	20.0	27.3		ug/L		137	62 - 138	3	30
Surrogate									
	%Recovery	LCSD Qualifier	Limits						
1,2-Dichloroethane-d4 (Surr)	79		74 - 132						
Toluene-d8 (Surr)	86		80 - 120						
Dibromofluoromethane (Surr)	88		72 - 131						
4-Bromofluorobenzene	85		77 - 124						

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

Lab Sample ID: MB 460-657367/8
Matrix: Water
Analysis Batch: 657367

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			11/22/19 11:32	1
Surrogate									
	%Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
4-Bromofluorobenzene	93		72 - 133					11/22/19 11:32	1

Lab Sample ID: LCS 460-657367/3
Matrix: Water
Analysis Batch: 657367

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	4.16		ug/L		83	66 - 135		
Surrogate									
	%Recovery	LCS Qualifier	Limits						
4-Bromofluorobenzene	93		72 - 133						

Lab Sample ID: LCSD 460-657367/4
Matrix: Water
Analysis Batch: 657367

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	4.21		ug/L		84	66 - 135	1	30
Surrogate									
	%Recovery	LCSD Qualifier	Limits						
4-Bromofluorobenzene	92		72 - 133						

QC Association Summary

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

Job ID: 460-196848-1

GC/MS VOA

Analysis Batch: 657367

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-196848-2	MW-164S_111319	Total/NA	Water	8260C SIM	
MB 460-657367/8	Method Blank	Total/NA	Water	8260C SIM	
LCS 460-657367/3	Lab Control Sample	Total/NA	Water	8260C SIM	
LCSD 460-657367/4	Lab Control Sample Dup	Total/NA	Water	8260C SIM	

Analysis Batch: 657765

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-196848-2	MW-164S_111319	Total/NA	Water	8260C	
MB 460-657765/10	Method Blank	Total/NA	Water	8260C	
LCS 460-657765/15	Lab Control Sample	Total/NA	Water	8260C	
LCSD 460-657765/16	Lab Control Sample Dup	Total/NA	Water	8260C	

Analysis Batch: 657905

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
460-196848-1	Trip Blank	Total/NA	Water	8260C	
MB 460-657905/8	Method Blank	Total/NA	Water	8260C	
LCS 460-657905/3	Lab Control Sample	Total/NA	Water	8260C	
LCSD 460-657905/4	Lab Control Sample Dup	Total/NA	Water	8260C	

Lab Chronicle

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

Job ID: 460-196848-1

Client Sample ID: Trip Blank

Date Collected: 11/13/19 00:00

Date Received: 11/15/19 10:00

Lab Sample ID: 460-196848-1

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	657905	11/24/19 14:44	VZD	TAL EDI

Client Sample ID: MW-164S_111319

Date Collected: 11/13/19 16:03

Date Received: 11/15/19 10:00

Lab Sample ID: 460-196848-2

Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260C		1	657765	11/23/19 23:32	VBP	TAL EDI
Total/NA	Analysis	8260C SIM		1	657367	11/22/19 14:54	SZD	TAL EDI

Laboratory References:

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

Accreditation/Certification Summary

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

Job ID: 460-196848-1

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 Off-Site

Job ID: 460-196848-1

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 Off-Site

Job ID: 460-196848-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
460-196848-1	Trip Blank	Water	11/13/19 00:00	11/15/19 10:00	
460-196848-2	MW-164S_111319	Water	11/13/19 16:03	11/15/19 10:00	

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MICHIGAN

190

TestAmerica Laboratory location: Brighton --- 10448 Chilton Drive, Suite 200 / Brighton, MI 48116 / 810-229-2783

Chain of Custody Record

TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

Client Contact

Regulatory program:

DW NPDES RCRA Other

TestAmerica Laboratories, Inc.

Company Name: Arcadis
 Address: 28550 Cabot Drive, Suite 500
 City/State/Zip: Novi, MI, 48317
 Phone: 248-994-2240
 Project Name: Ford LTP Off-Site
 Project Number: 30016346.0002B
 PO # 30016346.0002B

Client Project Manager: Kris Hinesky
 Telephone: 248-994-2240
 Email: kristofer.hinesky@arcadis.com
 Sampler Name: *Neilson Bender*
 Method of Shipment/Carrier:
 Shipping/Tracking No:

Site Contact: Rachel Bielak
 Telephone: 248-946-6331
 Lab Contact: Mike DelMonte
 Telephone: 330-497-9396

Analyses

TAT if different from below
 10 day
 3 weeks
 2 weeks
 1 week
 2 days
 1 day

Sample Identification	Sample Date	Sample Time	Matrix					H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Unpres	Other:	Filter/discard sample (Y/N)	Composite/Grab-C	Analyses							Sample Specific Notes / Special Instructions
			Air	Aqueous	Sediment	Solid	Other:										1,1-DCE 8260B	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 UDA	
MW-1645_111319	11/21/19	1603	X																				6 VOA's	



Special Instructions/OC Requirements & Comments: Possible Hazard Identification: Harmable Irritant Poison B Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): Return to Client Dispose By Lab Archive For _____ Months

Submit all results through Cadena at jim.tomalia@cadena.com. Cadena #E203631
 Level IV Reporting requested.

Relinquished by: <i>[Signature]</i>	Company: Arcadis	Date/Time: 11/13/19 1705	Received by: <i>[Signature]</i>	Company: Arcadis	Date/Time: 11/15/19 1800
Relinquished by: <i>[Signature]</i>	Company: Arcadis	Date/Time: 11/13/19 1800	Received by: <i>Don Cold Storage</i>	Company: Arcadis	Date/Time: 11/13/19 1800
Relinquished by: <i>Paul Bielak</i>	Company: ARCADIS	Date/Time: 11/14/19 1335	Received in Laboratory by: <i>[Signature]</i>	Company: ETA	Date/Time: 11-14-19 1340

ETA 11-14-19 1415
 Kyara Knowlde ETA 11/15/19 1000
 Via fax seal-1055303 ER# 23
 01.3' @ 1.7%

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Eurofins TestAmerica Edison
Receipt Temperature and pH Log

Job Number: 196848

Number of Coolers: 2 IR Gun # 14

Cooler #	Temperature (°C)		Cooler #	Temperature (°C)	
	RAW	CORRECTED		RAW	CORRECTED
Cooler #1:	13	16	Cooler #4:		
Cooler #2:	17	20	Cooler #5:		
Cooler #3:			Cooler #6:		
			Cooler #7:		
			Cooler #8:		
			Cooler #9:		

TALS Sample Number	(pH<2)	(pH<2)	(pH<2)	(pH<2)	(pH<2)	(pH<2)	(pH<2)	(pH<2)	(pH<2)	(pH<2)	(pH<2)	(pH<2)	(pH<2)	(pH<2)	(pH<2)	(pH<2)	(pH<2)	(pH<2)	(pH<2)	(pH<2)
	Ammonia	COD	Nitrate Nitrite	Metals *	Hardness	Pest	EPH or QAM	Phenols	Sulfide	TKN	TOC	Total Cyanide	Total Phos	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: ER
 Date: 11/15/19

Login Sample Receipt Checklist

Client: ARCADIS U.S., Inc.

Job Number: 460-196848-1

Login Number: 196848

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	

