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ANALYTICAL REPORT

Eurofins TestAmerica, Canton
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Tel: (330)497-9396

Laboratory Job ID: 240-119187-1
Client Project/Site: Ford LTP Livonia MI - E203631

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

Attn: Kristoffer Hinskey

Authorized for release by:
10/4/2019 11:42:18 AM

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Definitions/Glossary

Client: ARCADIS U.S., Inc. Job ID: 240-119187-1
Project/Site: Ford LTP Livonia MI - E203631

Qualifiers

GC/MS VOA

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

Glossary

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

Job ID: 240-119187-1

Laboratory: Eurofins TestAmerica, Canton

Narrative

CASE NARRATIVE

Client: ARCADIS U.S., Inc.

Project: Ford LTP Livonia MI - E203631

Report Number: 240-119187-1

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 9/20/2019 8:25 AM; the samples arrived in good condition, properly preserved and, where required, on ice. The temperatures of the 3 coolers at receipt time were 1.7º C, 1.9º C and 3.3º C.

VOLATILE ORGANIC COMPOUNDS (GCMS)

Samples MW-75D_091819 (240-119187-1), MW-75SR_091819 (240-119187-2), MW-74_091819 (240-119187-3), MW-74S_091819 (240-119187-4) and TRIP BLANK (240-119187-5) were analyzed for volatile organic compounds (GCMS) in accordance with EPA SW-846 Method 8260B. The samples were analyzed on 09/29/2019.

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

VOLATILE ORGANIC COMPOUNDS (GCMS SIM)

Samples MW-75D_091819 (240-119187-1), MW-75SR_091819 (240-119187-2), MW-74_091819 (240-119187-3) and MW-74S_091819 (240-119187-4) were analyzed for volatile organic compounds (GCMS SIM) in accordance with EPA SW-846 Method 8260B SIM. The samples were analyzed on 09/26/2019.

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

Method Summary

Client: ARCADIS U.S., Inc.
Job ID: 240-119187-1
Project/Site: Ford LTP Livonia MI - E203631

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 - E203631

Job ID: 240-119187-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-119187-1	MW-75D_091819	Water	09/18/19 11:44	09/20/19 08:25	
240-119187-2	MW-75SR_091819	Water	09/18/19 13:23	09/20/19 08:25	
240-119187-3	MW-74_091819	Water	09/18/19 14:02	09/20/19 08:25	
240-119187-4	MW-74S_091819	Water	09/18/19 16:53	09/20/19 08:25	
240-119187-5	TRIP BLANK	Water	09/18/19 00:00	09/20/19 08:25	

Detection Summary

Client: ARCADIS U.S., Inc.
Job ID: 240-119187-1
Project/Site: Ford LTP Livonia MI - E203631

Client Sample ID: MW-75D_091819 — Lab Sample ID: 240-119187-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	3.3		2.0	0.86	ug/L	1		8260B SIM	Total/NA
Vinyl chloride	1.6		1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: MW-75SR_091819 — Lab Sample ID: 240-119187-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	0.51	J	1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: MW-74_091819 — Lab Sample ID: 240-119187-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
1,4-Dioxane	1.4	J	2.0	0.86	ug/L	1		8260B SIM	Total/NA
cis-1,2-Dichloroethene	0.62	J	1.0	0.16	ug/L	1		8260B	Total/NA
Vinyl chloride	1.7		1.0	0.20	ug/L	1		8260B	Total/NA

Client Sample ID: MW-74S_091819 — Lab Sample ID: 240-119187-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
cis-1,2-Dichloroethene	1.0		1.0	0.16	ug/L	1		8260B	Total/NA

Client Sample ID: TRIP BLANK — Lab Sample ID: 240-119187-5

No Detections.

This Detection Summary does not include radiochemical test results.

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

Job ID: 240-119187-1

Client Sample ID: MW-75D_091819

Date Collected: 09/18/19 11:44
Date Received: 09/20/19 08:25

Lab Sample ID: 240-119187-1

Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**3.3**		2.0	0.86	ug/L			09/26/19 14:04	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*73*		*63 - 125*		*09/26/19 14:04*	*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			09/29/19 18:51	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			09/29/19 18:51	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			09/29/19 18:51	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			09/29/19 18:51	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			09/29/19 18:51	1
Vinyl chloride	**1.6**		1.0	0.20	ug/L			09/29/19 18:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*117*		*70 - 121*		*09/29/19 18:51*	*1*
4-Bromofluorobenzene (Surr)	*101*		*59 - 120*		*09/29/19 18:51*	*1*
Toluene-d8 (Surr)	*101*		*70 - 123*		*09/29/19 18:51*	*1*
Dibromofluoromethane (Surr)	*89*		*75 - 128*		*09/29/19 18:51*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

Job ID: 240-119187-1

Client Sample ID: MW-75SR_091819

Lab Sample ID: 240-119187-2

Date Collected: 09/18/19 13:23

Matrix: Water

Date Received: 09/20/19 08:25

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			09/26/19 14:29	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*71*		*63 - 125*		*09/26/19 14:29*	*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			09/29/19 19:13	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			09/29/19 19:13	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			09/29/19 19:13	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			09/29/19 19:13	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			09/29/19 19:13	1
Vinyl chloride	**0.51**	**J**	1.0	0.20	ug/L			09/29/19 19:13	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*120*		*70 - 121*		*09/29/19 19:13*	*1*
4-Bromofluorobenzene (Surr)	*100*		*59 - 120*		*09/29/19 19:13*	*1*
Toluene-d8 (Surr)	*99*		*70 - 123*		*09/29/19 19:13*	*1*
Dibromofluoromethane (Surr)	*91*		*75 - 128*		*09/29/19 19:13*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

Job ID: 240-119187-1

Client Sample ID: MW-74_091819

Date Collected: 09/18/19 14:02
Date Received: 09/20/19 08:25

Lab Sample ID: 240-119187-3

Matrix: Water

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dioxane	**1.4**	**J**	2.0	0.86	ug/L			09/26/19 14:54	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*76*		*63 - 125*		*09/26/19 14:54*	*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			09/29/19 19:35	1
cis-1,2-Dichloroethene	**0.62**	**J**	1.0	0.16	ug/L			09/29/19 19:35	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			09/29/19 19:35	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			09/29/19 19:35	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			09/29/19 19:35	1
Vinyl chloride	**1.7**		1.0	0.20	ug/L			09/29/19 19:35	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*114*		*70 - 121*		*09/29/19 19:35*	*1*
4-Bromofluorobenzene (Surr)	*101*		*59 - 120*		*09/29/19 19:35*	*1*
Toluene-d8 (Surr)	*101*		*70 - 123*		*09/29/19 19:35*	*1*
Dibromofluoromethane (Surr)	*87*		*75 - 128*		*09/29/19 19:35*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

Job ID: 240-119187-1

Client Sample ID: MW-74S_091819
Date Collected: 09/18/19 16:53
Date Received: 09/20/19 08:25

Lab Sample ID: 240-119187-4
Matrix: Water

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			09/26/19 15:20	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*72*		*63 - 125*		*09/26/19 15:20*	*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			09/29/19 19:57	1
cis-1,2-Dichloroethene	**1.0**		1.0	0.16	ug/L			09/29/19 19:57	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			09/29/19 19:57	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			09/29/19 19:57	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			09/29/19 19:57	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			09/29/19 19:57	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*119*		*70 - 121*		*09/29/19 19:57*	*1*
4-Bromofluorobenzene (Surr)	*100*		*59 - 120*		*09/29/19 19:57*	*1*
Toluene-d8 (Surr)	*102*		*70 - 123*		*09/29/19 19:57*	*1*
Dibromofluoromethane (Surr)	*88*		*75 - 128*		*09/29/19 19:57*	*1*

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

Job ID: 240-119187-1

Client Sample ID: TRIP BLANK

Lab Sample ID: 240-119187-5

Date Collected: 09/18/19 00:00

Matrix: Water

Date Received: 09/20/19 08:25

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			09/29/19 20:19	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			09/29/19 20:19	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			09/29/19 20:19	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			09/29/19 20:19	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			09/29/19 20:19	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			09/29/19 20:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*114*		*70 - 121*		*09/29/19 20:19*	*1*
4-Bromofluorobenzene (Surr)	*98*		*59 - 120*		*09/29/19 20:19*	*1*
Toluene-d8 (Surr)	*100*		*70 - 123*		*09/29/19 20:19*	*1*
Dibromofluoromethane (Surr)	*85*		*75 - 128*		*09/29/19 20:19*	*1*

Surrogate Summary

Client: ARCADIS U.S., Inc.
Project/Site: Ford LTP Livonia MI - E203631

Job ID: 240-119187-1

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

Matrix: Water

Prep Type: Total/NA

		Percent Surrogate Recovery (Acceptance Limits)			
		DCA	BFB	TOL	DBFM
Lab Sample ID	Client Sample ID	(70-121)	(59-120)	(70-123)	(75-128)
240-119165-B-3 MSD	Matrix Spike Duplicate	112	99	102	93
240-119165-H-3 MS	Matrix Spike	107	99	99	87
240-119187-1	MW-75D_091819	117	101	101	89
240-119187-2	MW-75SR_091819	120	100	99	91
240-119187-3	MW-74_091819	114	101	101	87
240-119187-4	MW-74S_091819	119	100	102	88
240-119187-5	TRIP BLANK	114	98	100	85
LCS 240-403073/4	Lab Control Sample	114	99	98	95
MB 240-403073/6	Method Blank	115	96	100	92

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)
		DCA
Lab Sample ID	Client Sample ID	(63-125)
240-119187-1	MW-75D_091819	73
240-119187-2	MW-75SR_091819	71
240-119187-3	MW-74_091819	76
240-119187-4	MW-74S_091819	72
240-119202-D-1 MS	Matrix Spike	73
240-119202-D-1 MSD	Matrix Spike Duplicate	72
LCS 240-402640/4	Lab Control Sample	72
MB 240-402640/5	Method Blank	72

Surrogate Legend

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

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

Lab Sample ID: MB 240-403073/6
Matrix: Water
Analysis Batch: 403073

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			09/29/19 11:50	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			09/29/19 11:50	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			09/29/19 11:50	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			09/29/19 11:50	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			09/29/19 11:50	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			09/29/19 11:50	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
1,2-Dichloroethane-d4 (Surr)	*115*		*70 - 121*		*09/29/19 11:50*	*1*
4-Bromofluorobenzene (Surr)	*96*		*59 - 120*		*09/29/19 11:50*	*1*
Toluene-d8 (Surr)	*100*		*70 - 123*		*09/29/19 11:50*	*1*
Dibromofluoromethane (Surr)	*92*		*75 - 128*		*09/29/19 11:50*	*1*

Lab Sample ID: LCS 240-403073/4
Matrix: Water
Analysis Batch: 403073

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	8.73		ug/L		87	65 - 139
cis-1,2-Dichloroethene	10.0	9.45		ug/L		95	76 - 128
Tetrachloroethene	10.0	8.64		ug/L		86	74 - 130
trans-1,2-Dichloroethene	10.0	9.38		ug/L		94	78 - 133
Trichloroethene	10.0	7.93		ug/L		79	76 - 125
Vinyl chloride	10.0	8.09		ug/L		81	58 - 143

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*114*		*70 - 121*
4-Bromofluorobenzene (Surr)	*99*		*59 - 120*
Toluene-d8 (Surr)	*98*		*70 - 123*
Dibromofluoromethane (Surr)	*95*		*75 - 128*

Lab Sample ID: 240-119165-B-3 MSD
Matrix: Water
Analysis Batch: 403073

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
1,1-Dichloroethene	1.0	U	10.0	9.56		ug/L		96	53 - 140	15	35
cis-1,2-Dichloroethene	1.0	U	10.0	9.44		ug/L		94	64 - 130	7	21
Tetrachloroethene	1.0	U	10.0	8.88		ug/L		89	51 - 136	12	23
trans-1,2-Dichloroethene	1.0	U	10.0	9.42		ug/L		94	68 - 133	12	24
Trichloroethene	1.0	U	10.0	8.76		ug/L		88	55 - 131	17	23
Vinyl chloride	1.0	U	10.0	8.18		ug/L		82	43 - 154	10	29

Surrogate	*MSD %Recovery*	*MSD Qualifier*	*Limits*
1,2-Dichloroethane-d4 (Surr)	*112*		*70 - 121*
4-Bromofluorobenzene (Surr)	*99*		*59 - 120*
Toluene-d8 (Surr)	*102*		*70 - 123*

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

Lab Sample ID: 240-119165-B-3 MSD
Matrix: Water
Analysis Batch: 403073

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

Surrogate	MSD %Recovery	MSD Qualifier	Limits
Dibromofluoromethane (Surr)	*93*		*75 - 128*

Lab Sample ID: 240-119165-H-3 MS
Matrix: Water
Analysis Batch: 403073

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

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	1.0	U	10.0	8.22		ug/L		82	53 - 140
cis-1,2-Dichloroethene	1.0	U	10.0	8.77		ug/L		88	64 - 130
Tetrachloroethene	1.0	U	10.0	7.90		ug/L		79	51 - 136
trans-1,2-Dichloroethene	1.0	U	10.0	8.33		ug/L		83	68 - 133
Trichloroethene	1.0	U	10.0	7.38		ug/L		74	55 - 131
Vinyl chloride	1.0	U	10.0	7.42		ug/L		74	43 - 154

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*107*		*70 - 121*
4-Bromofluorobenzene (Surr)	*99*		*59 - 120*
Toluene-d8 (Surr)	*99*		*70 - 123*
Dibromofluoromethane (Surr)	*87*		*75 - 128*

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

Lab Sample ID: MB 240-402640/5
Matrix: Water
Analysis Batch: 402640

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			09/26/19 12:48	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	*72*		*63 - 125*		*09/26/19 12:48*	*1*

Lab Sample ID: LCS 240-402640/4
Matrix: Water
Analysis Batch: 402640

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	11.5		ug/L		115	59 - 131

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*72*		*63 - 125*

Lab Sample ID: 240-119202-D-1 MS
Matrix: Water
Analysis Batch: 402640

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	10.0	12.3		ug/L		123	52 - 129

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

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*73*		*63 - 125*

Lab Sample ID: 240-119202-D-1 MSD
Matrix: Water
Analysis Batch: 402640

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	10.0	12.7		ug/L		127	52 - 129	3	13

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	*72*		*63 - 125*

QC Association Summary

Client: ARCADIS U.S., Inc.
Job ID: 240-119187-1
Project/Site: Ford LTP Livonia MI - E203631

GC/MS VOA

Analysis Batch: 402640

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-119187-1	MW-75D_091819	Total/NA	Water	8260B SIM	
240-119187-2	MW-75SR_091819	Total/NA	Water	8260B SIM	
240-119187-3	MW-74_091819	Total/NA	Water	8260B SIM	
240-119187-4	MW-74S_091819	Total/NA	Water	8260B SIM	
MB 240-402640/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-402640/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-119202-D-1 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-119202-D-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

Analysis Batch: 403073

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-119187-1	MW-75D_091819	Total/NA	Water	8260B	
240-119187-2	MW-75SR_091819	Total/NA	Water	8260B	
240-119187-3	MW-74_091819	Total/NA	Water	8260B	
240-119187-4	MW-74S_091819	Total/NA	Water	8260B	
240-119187-5	TRIP BLANK	Total/NA	Water	8260B	
MB 240-403073/6	Method Blank	Total/NA	Water	8260B	
LCS 240-403073/4	Lab Control Sample	Total/NA	Water	8260B	
240-119165-B-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
240-119165-H-3 MS	Matrix Spike	Total/NA	Water	8260B	

Lab Chronicle

Client: ARCADIS U.S., Inc.
Job ID: 240-119187-1
Project/Site: Ford LTP Livonia MI - E203631

Client Sample ID: MW-75D_091819
Lab Sample ID: 240-119187-1
Date Collected: 09/18/19 11:44
Matrix: Water
Date Received: 09/20/19 08:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	403073	09/29/19 18:51	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	402640	09/26/19 14:04	SAM	TAL CAN

Client Sample ID: MW-75SR_091819
Lab Sample ID: 240-119187-2
Date Collected: 09/18/19 13:23
Matrix: Water
Date Received: 09/20/19 08:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	403073	09/29/19 19:13	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	402640	09/26/19 14:29	SAM	TAL CAN

Client Sample ID: MW-74_091819
Lab Sample ID: 240-119187-3
Date Collected: 09/18/19 14:02
Matrix: Water
Date Received: 09/20/19 08:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	403073	09/29/19 19:35	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	402640	09/26/19 14:54	SAM	TAL CAN

Client Sample ID: MW-74S_091819
Lab Sample ID: 240-119187-4
Date Collected: 09/18/19 16:53
Matrix: Water
Date Received: 09/20/19 08:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	403073	09/29/19 19:57	LEE	TAL CAN
Total/NA	Analysis	8260B SIM		1	402640	09/26/19 15:20	SAM	TAL CAN

Client Sample ID: TRIP BLANK
Lab Sample ID: 240-119187-5
Date Collected: 09/18/19 00:00
Matrix: Water
Date Received: 09/20/19 08:25

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	403073	09/29/19 20:19	LEE	TAL CAN

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

Accreditation/Certification Summary

Client: ARCADIS U.S., Inc.
Job ID: 240-119187-1
Project/Site: Ford LTP Livonia MI - E203631

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
Georgia	State Program	N/A	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

MICHIGAN
190

2.6/33 1.0/1.7 1.2/1.9

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

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

Regulatory program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager: Kris Hinskey	Site Contact: Rachel Bielak	Lab Contact: Mike DelMonico	COC No:
Company Name: Arcadis				
Address: 28550 Cabot Drive, Suite 500	Telephone: 248-994-2240	Telephone: 248-946-6331	Telephone: 330-497-9396	of COCs
City/State/Zip: Novi, MI, 48377	Email: kristoffer.hinskey@arcadis.com			
Phone: 248-994-2240				
Project Name: Ford LTP				
Project Number: MI001454.0004.0002B	Method of Shipment/Carrier:			
PO # MI001454.0004.0002B	Shipping/Tracking No:			

Analysis Turnaround Time

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

For lab use only
Walk-in client
Lab sampling
Job/SDG No:

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	Zn(Ac) NaOH	Unpres	Other:	Filtered Sample (Y / N)	Composite=C / Grab=G	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:
MW-75D_091819	9.18.19	1144		X						X					N	G	X	X	X	X	X	X	X	6 containers
MW-75SR_091819	9.18.19	1323		X						X					N	G	X	X	X	X	X	X	X	6 containers
MW-74-091819	9.18.19	1402		X						X					N	G	X	X	X	X	X	X	X	6 containers
MW-74S_091819	9.18.19	1653		X						X					N	G	X	X	X	X	X	X	X	6 containers
Trip Blank	—	—		X																				1 container

240-119187 Chain of Custody

Possible Hazard Identification
☑ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

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

Special Instructions/QC Requirements & Comments:

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

Relinquished by:	Company:	Date/Time:	Received by:	Company:	Date/Time:
	Arcadis	9/18/19 1900	Novi Cold Storage	Arcadis	9/18/19 1900
Rachel Bielak	Arcadis	9/19/19 1015		FEA	9-19-19 1015
	FEA	9-19-19 1405	Received in Laboratory by:	TAL	9/20/19 825

Eurofins TestAmerica Canton Sample Receipt Form/Narrative **Login # : 119187**
Canton Facility

Client Arcadis Site Name _____ Cooler unpacked by: DcD

Cooler Received on 9/20/19 Opened on 9/20/19

FedEx: 1st Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other _____

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

TestAmerica Cooler # TAC 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-10 (CF +0.7 °C) Observed Cooler Temp._____°C Corrected Cooler Temp._____°C
   IR GUN #IR-11 (CF +0.9°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 each — 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
   -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
    If yes, Questions 12-16 have been checked at the originating laboratory.
12. Were all preserved sample(s) at the correct pH upon receipt? — Yes No NA pH Strip Lot# HC991818
13. Were VOAs on the COC? — Yes No
14. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this. — Yes No NA
15. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # N/A — 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: MS

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: _____

Login # : 119187

Eurofins TestAmerica Canton Sample Receipt Multiple Cooler Form

Cooler Description (Circle)	IR Gun # (Circle)	Observed Temp °C	Corrected Temp °C	Coolant (Circle)
TA Client Box Other	**IR-10** IR-11	2.6	3.3	**Wet Ice** Blue Ice Dry Ice Water None
TA Client Box Other	**IR-10** IR-11	1.0	1.7	**Wet Ice** Blue Ice Dry Ice Water None
TA Client Box Other	**IR-10** IR-11	1.2	1.9	**Wet Ice** Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None
TA Client Box Other	IR-10 IR-11			Wet Ice Blue Ice Dry Ice Water None

☐ See Temperature Excursion Form

WI-NC-099 Cooler Receipt Form Page 2 – Multiple Coolers