

## ANALYTICAL REPORT

Eurofins TestAmerica, Canton  
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North Canton, OH 44720  
Tel: (330)497-9396

Laboratory Job ID: 240-144509-1  
Client Project/Site: Ford LTP - Off Site  
Revision: 1

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

Attn: Kristoffer Hinskey



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Authorized for release by:  
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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 - Off Site

Job ID: 240-144509-1

## Qualifiers

### GC/MS VOA

Qualifier	Qualifier Description
H	Sample was prepped or analyzed beyond the specified holding time
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
CFU	Colony Forming Unit
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)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
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)
TNTC	Too Numerous To Count

# Case Narrative

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

Job ID: 240-144509-1

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## Job ID: 240-144509-1

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Laboratory: Eurofins TestAmerica, Canton

### Narrative

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Job Narrative  
240-144509-1

### Comments

No additional comments.

### Revision

The report being provided is a revision of the original report sent on 2/25/2021. The report (revision 1) is being revised due to: Samples mislabeled during unpacking - revised to correct data..

### Receipt

The samples were received on 2/13/2021 8:00 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 1.6° C.

### GC/MS VOA

Method 8260B: The following sample was analyzed outside of analytical holding time due to mis-labeled vial: TRIP BLANK (240-144509-1).

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

### VOA Prep

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

# Method Summary

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

Job ID: 240-144509-1

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 - Off Site

Job ID: 240-144509-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
240-144509-1	TRIP BLANK	Water	02/11/21 00:00	02/13/21 08:00	
240-144509-2	MW-149S_021121	Water	02/11/21 12:10	02/13/21 08:00	
240-144509-4	DUP-15	Water	02/11/21 00:00	02/13/21 08:00	

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

# Detection Summary

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

Job ID: 240-144509-1

**Client Sample ID: TRIP BLANK**

**Lab Sample ID: 240-144509-1**

No Detections.

**Client Sample ID: MW-149S\_021121**

**Lab Sample ID: 240-144509-2**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	1.7		1.0	0.20	ug/L	1		8260B	Total/NA

**Client Sample ID: DUP-15**

**Lab Sample ID: 240-144509-4**

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Vinyl chloride	1.7		1.0	0.20	ug/L	1		8260B	Total/NA

This Detection Summary does not include radiochemical test results.

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# Client Sample Results

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

Job ID: 240-144509-1

**Client Sample ID: TRIP BLANK**

**Lab Sample ID: 240-144509-1**

**Date Collected: 02/11/21 00:00**

**Matrix: Water**

**Date Received: 02/13/21 08:00**

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	1.0	U H	1.0	0.19	ug/L			03/15/21 18:10	1
cis-1,2-Dichloroethene	1.0	U H	1.0	0.16	ug/L			03/15/21 18:10	1
Tetrachloroethene	1.0	U H	1.0	0.15	ug/L			03/15/21 18:10	1
trans-1,2-Dichloroethene	1.0	U H	1.0	0.19	ug/L			03/15/21 18:10	1
Trichloroethene	1.0	U H	1.0	0.10	ug/L			03/15/21 18:10	1
Vinyl chloride	1.0	U H	1.0	0.20	ug/L			03/15/21 18:10	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	83		75 - 130		03/15/21 18:10	1
4-Bromofluorobenzene (Surr)	96		47 - 134		03/15/21 18:10	1
Toluene-d8 (Surr)	99		69 - 122		03/15/21 18:10	1
Dibromofluoromethane (Surr)	87		78 - 129		03/15/21 18:10	1



# Client Sample Results

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

Job ID: 240-144509-1

**Client Sample ID: MW-149S\_021121**

**Lab Sample ID: 240-144509-2**

**Date Collected: 02/11/21 12:10**

**Matrix: Water**

**Date Received: 02/13/21 08:00**

**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			02/19/21 13:15	1
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
1,2-Dichloroethane-d4 (Surr)	83		70 - 133					02/19/21 13:15	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			02/22/21 22:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 22:22	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 22:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 22:22	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 22:22	1
<b>Vinyl chloride</b>	<b>1.7</b>		1.0	0.20	ug/L			02/22/21 22:22	1
<b>Surrogate</b>	<b>%Recovery</b>	<b>Qualifier</b>	<b>Limits</b>				<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
1,2-Dichloroethane-d4 (Surr)	113		75 - 130					02/22/21 22:22	1
4-Bromofluorobenzene (Surr)	65		47 - 134					02/22/21 22:22	1
Toluene-d8 (Surr)	78		69 - 122					02/22/21 22:22	1
Dibromofluoromethane (Surr)	126		78 - 129					02/22/21 22:22	1

# Client Sample Results

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

Job ID: 240-144509-1

**Client Sample ID: DUP-15**  
**Date Collected: 02/11/21 00:00**  
**Date Received: 02/13/21 08:00**

**Lab Sample ID: 240-144509-4**  
**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			02/19/21 12:49	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	84		70 - 133					02/19/21 12:49	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			02/22/21 21:59	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 21:59	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 21:59	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 21:59	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 21:59	1
<b>Vinyl chloride</b>	<b>1.7</b>		1.0	0.20	ug/L			02/22/21 21:59	1
Surrogate	%Recovery	Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	115		75 - 130					02/22/21 21:59	1
4-Bromofluorobenzene (Surr)	65		47 - 134					02/22/21 21:59	1
Toluene-d8 (Surr)	81		69 - 122					02/22/21 21:59	1
Dibromofluoromethane (Surr)	121		78 - 129					02/22/21 21:59	1

# Surrogate Summary

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

Job ID: 240-144509-1

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

Matrix: Water

Prep Type: Total/NA

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)			
		DCA (75-130)	BFB (47-134)	TOL (69-122)	DBFM (78-129)
190-25454-E-1 MS	Matrix Spike	79	97	95	83
190-25454-F-1 MSD	Matrix Spike Duplicate	84	95	95	86
240-144509-1	TRIP BLANK	83	96	99	87
240-144509-2	MW-149S_021121	113	65	78	126
240-144509-4	DUP-15	115	65	81	121
240-144518-G-2 MSD	Matrix Spike Duplicate	80	87	87	96
240-144518-H-2 MS	Matrix Spike	88	96	91	95
LCS 240-473958/4	Lab Control Sample	91	90	88	95
LCS 240-476776/4	Lab Control Sample	78	94	97	83
MB 240-473958/7	Method Blank	112	68	79	114
MB 240-476776/7	Method Blank	80	91	98	81

### 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

Lab Sample ID	Client Sample ID	Percent Surrogate Recovery (Acceptance Limits)
		DCA (70-133)
240-144509-2	MW-149S_021121	83
240-144509-4	DUP-15	84
240-144515-J-3 MS	Matrix Spike	82
240-144515-J-3 MSD	Matrix Spike Duplicate	80
LCS 240-473720/4	Lab Control Sample	82
MB 240-473720/5	Method Blank	81

### Surrogate Legend

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

# QC Sample Results

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

Job ID: 240-144509-1

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

**Lab Sample ID: MB 240-473958/7**  
**Matrix: Water**  
**Analysis Batch: 473958**

**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	0.19	ug/L			02/22/21 16:24	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 16:24	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 16:24	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 16:24	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 16:24	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			02/22/21 16:24	1

Surrogate	MB MB		Limits	Prepared	Analyzed	Dil Fac
	%Recovery	Qualifier				
1,2-Dichloroethane-d4 (Surr)	112		75 - 130		02/22/21 16:24	1
4-Bromofluorobenzene (Surr)	68		47 - 134		02/22/21 16:24	1
Toluene-d8 (Surr)	79		69 - 122		02/22/21 16:24	1
Dibromofluoromethane (Surr)	114		78 - 129		02/22/21 16:24	1

**Lab Sample ID: LCS 240-473958/4**  
**Matrix: Water**  
**Analysis Batch: 473958**

**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	10.0	10.9		ug/L		109	73 - 129
cis-1,2-Dichloroethene	10.0	10.0		ug/L		100	75 - 124
Tetrachloroethene	10.0	12.2		ug/L		122	70 - 125
trans-1,2-Dichloroethene	10.0	11.0		ug/L		110	74 - 130
Trichloroethene	10.0	10.1		ug/L		101	71 - 121
Vinyl chloride	10.0	9.31		ug/L		93	61 - 134

Surrogate	LCS LCS		Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	91		75 - 130
4-Bromofluorobenzene (Surr)	90		47 - 134
Toluene-d8 (Surr)	88		69 - 122
Dibromofluoromethane (Surr)	95		78 - 129

**Lab Sample ID: 240-144518-G-2 MSD**  
**Matrix: Water**  
**Analysis Batch: 473958**

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

Analyte	Sample Sample		Spike Added	MSD MSD		Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
	Result	Qualifier		Result	Qualifier						
1,1-Dichloroethene	1.0	U	10.0	9.98		ug/L		100	64 - 132	3	35
cis-1,2-Dichloroethene	1.0	U	10.0	10.1		ug/L		101	68 - 121	7	35
Tetrachloroethene	1.0	U	10.0	10.7		ug/L		107	52 - 129	2	35
trans-1,2-Dichloroethene	1.0	U	10.0	10.2		ug/L		102	69 - 126	2	35
Trichloroethene	1.0	U	10.0	9.58		ug/L		96	56 - 124	1	35
Vinyl chloride	1.0	U	10.0	9.46		ug/L		95	49 - 136	3	35

Surrogate	MSD MSD		Limits
	%Recovery	Qualifier	
1,2-Dichloroethane-d4 (Surr)	80		75 - 130
4-Bromofluorobenzene (Surr)	87		47 - 134
Toluene-d8 (Surr)	87		69 - 122

Eurofins TestAmerica, Canton

# QC Sample Results

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

Job ID: 240-144509-1

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

**Lab Sample ID: 240-144518-G-2 MSD**  
**Matrix: Water**  
**Analysis Batch: 473958**

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

<i>Surrogate</i>	<i>%Recovery</i>	<i>MSD Qualifier</i>	<i>MSD Limits</i>
<i>Dibromofluoromethane (Surr)</i>	96		78 - 129

**Lab Sample ID: 240-144518-H-2 MS**  
**Matrix: Water**  
**Analysis Batch: 473958**

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

<b>Analyte</b>	<b>Sample Result</b>	<b>Sample Qualifier</b>	<b>Spike Added</b>	<b>MS Result</b>	<b>MS Qualifier</b>	<b>Unit</b>	<b>D</b>	<b>%Rec</b>	<b>%Rec. Limits</b>
1,1-Dichloroethene	1.0	U	10.0	9.71		ug/L		97	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	9.40		ug/L		94	68 - 121
Tetrachloroethene	1.0	U	10.0	11.0		ug/L		110	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	10.4		ug/L		104	69 - 126
Trichloroethene	1.0	U	10.0	9.67		ug/L		97	56 - 124
Vinyl chloride	1.0	U	10.0	9.16		ug/L		92	49 - 136

<i>Surrogate</i>	<i>%Recovery</i>	<i>MS Qualifier</i>	<i>MS Limits</i>
<i>1,2-Dichloroethane-d4 (Surr)</i>	88		75 - 130
<i>4-Bromofluorobenzene (Surr)</i>	96		47 - 134
<i>Toluene-d8 (Surr)</i>	91		69 - 122
<i>Dibromofluoromethane (Surr)</i>	95		78 - 129

**Lab Sample ID: MB 240-476776/7**  
**Matrix: Water**  
**Analysis Batch: 476776**

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

<b>Analyte</b>	<b>MB Result</b>	<b>MB Qualifier</b>	<b>RL</b>	<b>MDL</b>	<b>Unit</b>	<b>D</b>	<b>Prepared</b>	<b>Analyzed</b>	<b>Dil Fac</b>
1,1-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/15/21 15:40	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			03/15/21 15:40	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			03/15/21 15:40	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			03/15/21 15:40	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			03/15/21 15:40	1
Vinyl chloride	1.0	U	1.0	0.20	ug/L			03/15/21 15:40	1

<i>Surrogate</i>	<i>%Recovery</i>	<i>MB Qualifier</i>	<i>MB Limits</i>	<i>Prepared</i>	<i>Analyzed</i>	<i>Dil Fac</i>
<i>1,2-Dichloroethane-d4 (Surr)</i>	80		75 - 130		03/15/21 15:40	1
<i>4-Bromofluorobenzene (Surr)</i>	91		47 - 134		03/15/21 15:40	1
<i>Toluene-d8 (Surr)</i>	98		69 - 122		03/15/21 15:40	1
<i>Dibromofluoromethane (Surr)</i>	81		78 - 129		03/15/21 15:40	1

**Lab Sample ID: LCS 240-476776/4**  
**Matrix: Water**  
**Analysis Batch: 476776**

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

<b>Analyte</b>	<b>Spike Added</b>	<b>LCS Result</b>	<b>LCS Qualifier</b>	<b>Unit</b>	<b>D</b>	<b>%Rec</b>	<b>%Rec. Limits</b>
1,1-Dichloroethene	10.0	8.48		ug/L		85	73 - 129
cis-1,2-Dichloroethene	10.0	9.17		ug/L		92	75 - 124
Tetrachloroethene	10.0	10.2		ug/L		102	70 - 125
trans-1,2-Dichloroethene	10.0	8.93		ug/L		89	74 - 130
Trichloroethene	10.0	8.97		ug/L		90	71 - 121

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# QC Sample Results

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

Job ID: 240-144509-1

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

**Lab Sample ID: LCS 240-476776/4**

**Matrix: Water**

**Analysis Batch: 476776**

**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	11.1		ug/L		111	61 - 134

Surrogate	LCS %Recovery	LCS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	78		75 - 130
4-Bromofluorobenzene (Surr)	94		47 - 134
Toluene-d8 (Surr)	97		69 - 122
Dibromofluoromethane (Surr)	83		78 - 129

**Lab Sample ID: 190-25454-E-1 MS**

**Matrix: Water**

**Analysis Batch: 476776**

**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	6.81		ug/L		68	64 - 132
cis-1,2-Dichloroethene	1.0	U	10.0	7.96		ug/L		80	68 - 121
Tetrachloroethene	1.0	U	10.0	8.88		ug/L		89	52 - 129
trans-1,2-Dichloroethene	1.0	U	10.0	7.48		ug/L		75	69 - 126
Trichloroethene	1.0	U	10.0	7.78		ug/L		78	56 - 124
Vinyl chloride	1.0	U	10.0	9.92		ug/L		99	49 - 136

Surrogate	MS %Recovery	MS Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	79		75 - 130
4-Bromofluorobenzene (Surr)	97		47 - 134
Toluene-d8 (Surr)	95		69 - 122
Dibromofluoromethane (Surr)	83		78 - 129

**Lab Sample ID: 190-25454-F-1 MSD**

**Matrix: Water**

**Analysis Batch: 476776**

**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	6.82		ug/L		68	64 - 132	0	35
cis-1,2-Dichloroethene	1.0	U	10.0	8.09		ug/L		81	68 - 121	2	35
Tetrachloroethene	1.0	U	10.0	8.78		ug/L		88	52 - 129	1	35
trans-1,2-Dichloroethene	1.0	U	10.0	7.87		ug/L		79	69 - 126	5	35
Trichloroethene	1.0	U	10.0	8.10		ug/L		81	56 - 124	4	35
Vinyl chloride	1.0	U	10.0	10.4		ug/L		104	49 - 136	4	35

Surrogate	MSD %Recovery	MSD Qualifier	Limits
1,2-Dichloroethane-d4 (Surr)	84		75 - 130
4-Bromofluorobenzene (Surr)	95		47 - 134
Toluene-d8 (Surr)	95		69 - 122
Dibromofluoromethane (Surr)	86		78 - 129

# QC Sample Results

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

Job ID: 240-144509-1

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

**Lab Sample ID: MB 240-473720/5**  
**Matrix: Water**  
**Analysis Batch: 473720**

**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			02/19/21 11:08	1
Surrogate	MB %Recovery	MB Qualifier	Limits				Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	81		70 - 133					02/19/21 11:08	1

**Lab Sample ID: LCS 240-473720/4**  
**Matrix: Water**  
**Analysis Batch: 473720**

**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	9.95		ug/L		100	80 - 135
Surrogate	LCS %Recovery	LCS Qualifier	Limits				
1,2-Dichloroethane-d4 (Surr)	82		70 - 133				

**Lab Sample ID: 240-144515-J-3 MS**  
**Matrix: Water**  
**Analysis Batch: 473720**

**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	11.0		ug/L		110	46 - 170
Surrogate	MS %Recovery	MS Qualifier	Limits						
1,2-Dichloroethane-d4 (Surr)	82		70 - 133						

**Lab Sample ID: 240-144515-J-3 MSD**  
**Matrix: Water**  
**Analysis Batch: 473720**

**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	Limit
1,4-Dioxane	2.0	U	10.0	10.6		ug/L		106	46 - 170	3	26
Surrogate	MSD %Recovery	MSD Qualifier	Limits								
1,2-Dichloroethane-d4 (Surr)	80		70 - 133								

# QC Association Summary

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

Job ID: 240-144509-1

## GC/MS VOA

### Analysis Batch: 473720

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144509-2	MW-149S_021121	Total/NA	Water	8260B SIM	
240-144509-4	DUP-15	Total/NA	Water	8260B SIM	
MB 240-473720/5	Method Blank	Total/NA	Water	8260B SIM	
LCS 240-473720/4	Lab Control Sample	Total/NA	Water	8260B SIM	
240-144515-J-3 MS	Matrix Spike	Total/NA	Water	8260B SIM	
240-144515-J-3 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B SIM	

### Analysis Batch: 473958

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144509-2	MW-149S_021121	Total/NA	Water	8260B	
240-144509-4	DUP-15	Total/NA	Water	8260B	
MB 240-473958/7	Method Blank	Total/NA	Water	8260B	
LCS 240-473958/4	Lab Control Sample	Total/NA	Water	8260B	
240-144518-G-2 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	
240-144518-H-2 MS	Matrix Spike	Total/NA	Water	8260B	

### Analysis Batch: 476776

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
240-144509-1	TRIP BLANK	Total/NA	Water	8260B	
MB 240-476776/7	Method Blank	Total/NA	Water	8260B	
LCS 240-476776/4	Lab Control Sample	Total/NA	Water	8260B	
190-25454-E-1 MS	Matrix Spike	Total/NA	Water	8260B	
190-25454-F-1 MSD	Matrix Spike Duplicate	Total/NA	Water	8260B	



# Lab Chronicle

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

Job ID: 240-144509-1

**Client Sample ID: TRIP BLANK**

**Lab Sample ID: 240-144509-1**

**Date Collected: 02/11/21 00:00**

**Matrix: Water**

**Date Received: 02/13/21 08:00**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	476776	03/15/21 18:10	LRW	TAL CAN

**Client Sample ID: MW-149S\_021121**

**Lab Sample ID: 240-144509-2**

**Date Collected: 02/11/21 12:10**

**Matrix: Water**

**Date Received: 02/13/21 08:00**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473958	02/22/21 22:22	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	473720	02/19/21 13:15	SAM	TAL CAN

**Client Sample ID: DUP-15**

**Lab Sample ID: 240-144509-4**

**Date Collected: 02/11/21 00:00**

**Matrix: Water**

**Date Received: 02/13/21 08:00**

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	8260B		1	473958	02/22/21 21:59	LRW	TAL CAN
Total/NA	Analysis	8260B SIM		1	473720	02/19/21 12:49	SAM	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.  
 Project/Site: Ford LTP - Off Site

Job ID: 240-144509-1

## Laboratory: Eurofins TestAmerica, Canton

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

Authority	Program	Identification Number	Expiration Date
California	State	2927	02-23-22
Connecticut	State	PH-0590	12-31-21
Florida	NELAP	E87225	06-30-21
Georgia	State	4062	02-23-21 *
Illinois	NELAP	004498	07-31-21
Iowa	State	421	06-01-21
Kansas	NELAP	E-10336	04-30-21
Kentucky (UST)	State	112225	02-23-21 *
Kentucky (WW)	State	KY98016	12-31-21
Minnesota	NELAP	OH00048	12-31-21
Minnesota (Petrofund)	State	3506	08-01-21
New Jersey	NELAP	OH001	06-30-21
New York	NELAP	10975	03-31-21
Ohio VAP	State	CL0024	12-21-23
Oregon	NELAP	4062	02-23-22
Pennsylvania	NELAP	68-00340	08-31-21
Texas	NELAP	T104704517-18-10	08-31-21
USDA	US Federal Programs	P330-18-00281	09-17-21
Virginia	NELAP	010101	09-14-21
Washington	State	C971	01-12-22
West Virginia DEP	State	210	12-31-21

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



**Eurofins TestAmerica Canton Sample Receipt Form/Narrative**  
**Canton Facility**

Login # : 144509

Client Arcadis Site Name \_\_\_\_\_  
 Cooler Received on 2-13-21 Opened on 2-13-21

Cooler unpacked by:  
Ryan C

FedEx: 1<sup>st</sup> Grd Exp UPS FAS Clipper Client Drop Off TestAmerica Courier Other \_\_\_\_\_

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

TestAmerica Cooler # 7A 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-11 (CF +0.1 °C) Observed Cooler Temp. 1.5 °C Corrected Cooler Temp. 1.6 °C  
 IR GUN #IR-12 (CF +0.2 °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  
 -Were tamper/custody seals intact and uncompromised? Yes No NA

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

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 (ID/Date/Time) be reconciled with the COC? Yes No  
 9. For each sample, does the COC specify preservatives (Y/N), # of containers (Y/N), and sample type of grab/comp (Y/N)?  
 10. Were correct bottle(s) used for the test(s) indicated? Yes No  
 11. Sufficient quantity received to perform indicated analyses? Yes No  
 12. Are these work share samples and all listed on the COC? Yes No

If yes, Questions 13-17 have been checked at the originating laboratory.

13. Were all preserved sample(s) at the correct pH upon receipt? Yes No NA pH Strip Lot# HC907861  
 14. Were VOAs on the COC? Yes No  
 15. Were air bubbles >6 mm in any VOA vials? Yes  Larger than this. Yes No NA  
 16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # 59072 Yes No  
 17. Was a LL Hg or Me Hg trip blank present? Yes No

Contacted PM \_\_\_\_\_ Date \_\_\_\_\_ by \_\_\_\_\_ via Verbal Voice Mail Other \_\_\_\_\_

Concerning \_\_\_\_\_

**18. CHAIN OF CUSTODY & SAMPLE DISCREPANCIES**  additional next page

Samples processed by: \_\_\_\_\_

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**19. 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)

**20. 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: \_\_\_\_\_

# DATA VERIFICATION REPORT



March 26, 2021

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: 30050315.402.04 off site  
Event Specific Scope of Work References: Sample COC  
Laboratory: TestAmerica - North Canton  
Laboratory submittal: 144509-1  
Sample date: 2021-02-11  
Report received by CADENA: 2021-03-26  
Initial Data Verification completed by CADENA: 2021-03-26  
Number of Samples:3  
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:

HTQ - GCMS VOC sample TRIP BLANK analysis was performed outside of reference holding time due to an initial sample mix-up so all associated results should be considered to be estimated and qualified with UJ flags if non-detect.

Sample/MS/MSD Surrogate Recovery, Blank/LCS Surrogate Recovery, LCS/LCD Recovery, 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 Inc, 1099 Highland Drive, Suite E, Ann Arbor, MI 48108 517-819-0356

## 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.





# Analytical Results Summary

## Reportable Results Only

CADENA Project ID: E203631  
 Laboratory: TestAmerica - North Canton  
 Laboratory Submittal: 144509-1

Sample Name: TRIP BLANK      MW-149S\_021121      DUP-15  
 Lab Sample ID: 2401445091      2401445092      2401445094  
 Sample Date: 2/11/2021      2/11/2021      2/11/2021

Analyte	Cas No.	Result	Limit	Units	Valid Qualifier	Result	Limit	Units	Valid Qualifier	Result	Limit	Units	Valid Qualifier
<u>GC/MS VOC</u>													
<u>OSW-8260B</u>													
1,1-Dichloroethene	75-35-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---	ND	1.0	ug/l	---
cis-1,2-Dichloroethene	156-59-2	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Tetrachloroethene	127-18-4	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---	ND	1.0	ug/l	---
trans-1,2-Dichloroethene	156-60-5	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Trichloroethene	79-01-6	ND	1.0	ug/l	UJ	ND	1.0	ug/l	---	ND	1.0	ug/l	---
Vinyl chloride	75-01-4	ND	1.0	ug/l	UJ	1.7	1.0	ug/l	---	1.7	1.0	ug/l	---
<u>OSW-8260BBSim</u>													
1,4-Dioxane	123-91-1					ND	2.0	ug/l	---	ND	2.0	ug/l	---

# Ford Motor Company – Livonia Transmission Project

## DATA REVIEW

### Livonia, Michigan


Volatile Organic Compounds (VOC) Analysis

SDG # 240-144509-1

CADENA Verification Report: 2021-03-26

Analyses Performed By:  
TestAmerica  
North Canton, Ohio

Report # 40567R  
Review Level: Tier III  
Project: 30080642.402.02



## DATA REVIEW

### SUMMARY

This data quality assessment summarizes the review of Sample Delivery Group (SDG) # 240-144509-1 for samples collected in association with the Ford – Livonia, Michigan site. The review was conducted as a Tier III validation in addition to a verification/Tier II validation review performed by CADENA Inc. and included review of level IV laboratory data package completeness. Only elements of a Tier III validation effort (Tier III) includes a detailed review of laboratory raw data to check for errors in calculation, calibration review, internal standard review and compound identification) and omitted deviations from the CADENA verification/Tier II report are documented in this report. Only analytical data associated with constituents of concern were reviewed for this validation. Field documentation was not included in this review. Included with this assessment are the validation annotated sample result sheets, and chain of custody. Analyses were performed on the following samples:

Sample ID	Lab ID	Matrix	Sample Collection Date	Parent Sample	Analysis	
					VOC	VOC SIM
TRIP BLANK	240-144509-1	Water	02/11/2021		X	
MW-149S_021121	240-144509-2	Water	02/11/2021		X	X
DUP-15	240-144509-4	Water	02/11/2021	MW-149S_021121	X	X

## DATA REVIEW

### ANALYTICAL DATA PACKAGE DOCUMENTATION

The table below is the evaluation of the data package completeness.

Items Reviewed	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
1. Sample receipt condition		X		X	
2. Requested analyses and sample results		X		X	
3. Master tracking list		X		X	
4. Methods of analysis		X		X	
5. Reporting limits		X		X	
6. Sample collection date		X		X	
7. Laboratory sample received date		X		X	
8. Sample preservation verification (as applicable)		X		X	
9. Sample preparation/extraction/analysis dates		X		X	
10. Fully executed Chain-of-Custody (COC) form		X		X	
11. Narrative summary of Quality Assurance or sample problems provided		X		X	
12. Data Package Completeness and Compliance		X		X	

## DATA REVIEW

### ORGANIC ANALYSIS INTRODUCTION

Analyses were performed according to United States Environmental Protection Agency (USEPA) SW-846 Method 8260B and 8260B SIM. Data were reviewed in accordance with USEPA National Functional Guidelines of October 1999.

The data review process is an evaluation of data on a technical basis rather than a determination of contract compliance. As such, the standards against which the data are being weighed may differ from those specified in the analytical method. It is assumed that the data package represents the best efforts of the laboratory and had already been subjected to adequate and sufficient quality review prior to submission.

During the review process, laboratory qualified and unqualified data are verified against the supporting documentation. Based on this evaluation, qualifier codes may be added, deleted, or modified by the data reviewer. Results are qualified with the following codes in accordance with USEPA National Functional Guidelines:

- Concentration (C) Qualifiers
  - U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.
  - B The compound has been found in the sample as well as its associated blank, its presence in the sample may be suspect.
- Quantitation (Q) Qualifiers
  - E The compound was quantitated above the calibration range.
  - D Concentration is based on a diluted sample analysis.
- Validation Qualifiers
  - J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.
  - UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
  - J+ The result is an estimated quantity, but the result may be biased high.
  - J- The result is an estimated quantity, but the result may be biased low.
  - UB Analyte considered non-detect at the listed value due to associated blank contamination.
  - N The analysis indicates the presence of a compound for which there is presumptive evidence to make a tentative identification.
  - R The sample results are rejected.

Two facts should be noted by all data users. First, the "R" flag means that the associated value is unusable. In other words, due to significant quality control (QC) problems, the analysis is invalid and provides no information as to whether the compound is present or not. "R" values should not appear on data tables because they cannot be relied upon, even as a last resort. The second fact to keep in mind is that no compound concentration, even if it has passed all QC tests, is guaranteed to be accurate. Strict QC serves to increase confidence in data but any value potentially contains error.

## DATA REVIEW

### VOLATILE ORGANIC COMPOUND (VOC) ANALYSES

#### 1. Holding Times

The specified holding times for the following methods are presented in the following table.

Method	Matrix	Holding Time	Preservation
SW-846 8260B/8260B-SIM	Water	14 days from collection to analysis	Cool to < 6 °C; pH < 2 with HCl

The analyses that exceeded the holding are presented in the following table.

Sample ID	Holding Time	Criteria
TRIP BLANK	32 days	14 days from collection to analysis

Sample results associated with samples mentioned in the table above, analyzed by analytical method SW-846 8260B were qualified, as specified in the table below. All other holding times were met.

Criteria	Qualification	
	Detected Analytes	Non-detect Analytes
Analysis completed less than two times holding time	J	UJ
Analysis completed greater than two times holding time	J	R

#### 2. Mass Spectrometer Tuning

Mass spectrometer performance was acceptable and all analyses were performed within a 12-hour tune clock.

System performance and column resolution were acceptable.

#### 3. Calibration

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of acceptable performance at the beginning of an experimental sequence. The continuing calibration verifies that the instrument daily performance is satisfactory.

##### 3.1 Initial Calibration

The method specifies percent relative standard deviation (%RSD) and relative response factor (RRF) limits for select compounds only. A technical review of the data applies limits to all compounds with no exceptions.

All target compounds associated with the initial calibration standards must exhibit a %RSD less than the control limit (20%) or a correlation coefficient greater than 0.99 and an RRF value greater than control limit (0.05).

All compounds associated with the initial calibrations were within the specified control limits.

##### 3.2 Continuing Calibration

All target compounds associated with the continuing calibration standard must exhibit a percent difference (%D) less than the control limit (20%) and RRF value greater than control limit (0.05).

All compounds associated with the calibrations were within the specified control limits.

## DATA REVIEW

### 4. Internal Standard Performance

Internal standard performance criteria ensure that the GC/MS sensitivity and response are stable during every sample analysis. The criteria require the internal standard compounds associated with the VOC exhibit area counts that are not greater than two times (+100%) or less than one-half (-50%) of the area counts of the associated continuing calibration standard.

All internal standard responses were within control limits.

### 5. Field Duplicate Analysis

Field duplicate analysis is used to assess the overall precision of the field sampling procedures and analytical method. A control limit of 30% for water matrices is applied to the RPD between the parent sample and the field duplicate. In the instance when the parent and/or duplicate sample concentrations are less than or equal to 5 times the RL, a control limit of two times the RL is applied for water matrices.

Results for duplicate samples are summarized in the following table.

Sample ID/Duplicate ID	Compound	Sample Result (µg/L)	Duplicate Result (µg/L)	RPD
MW-149S_021121 / DUP-15	Vinyl chloride	1.7	1.7	AC

#### Notes:

AC – Acceptable

The calculated differences between the parent sample and field duplicate were acceptable.

### 6. Compound Identification

Compounds are identified on the GC/MS by using the analytes relative retention time and ion spectra.

All identified compounds met the specified criteria.

### 7. System Performance and Overall Assessment

Overall system performance was acceptable. Other than for those deviations specifically mentioned in this review, the overall data quality is within the guidelines specified in the method.

## DATA REVIEW

### DATA VALIDATION CHECKLIST FOR VOCs

VOCs: 8260B/8260B-SIM	Reported		Performance Acceptable		Not Required
	No	Yes	No	Yes	
<b>GAS CHROMATOGRAPHY/MASS SPECTROMETRY (GC/MS)</b>					
<b>Tier II Validation</b>					
Holding times/Preservation		X	X		
<b>Tier III Validation</b>					
System performance and column resolution		X		X	
Initial calibration %RSDs		X		X	
Continuing calibration RRFs		X		X	
Continuing calibration %Ds		X		X	
Instrument tune and performance check		X		X	
Ion abundance criteria for each instrument used		X		X	
Field Duplicate RPD		X		X	
Internal standard		X		X	
Compound identification and quantitation					
A. Reconstructed ion chromatograms		X		X	
B. Quantitation Reports		X		X	
C. RT of sample compounds within the established RT windows		X		X	
D. Transcription/calculation errors present		X		X	
E. Reporting limits adjusted to reflect sample dilutions		X		X	

**Notes:**

%RSD Relative standard deviation

%R Percent recovery

RPD Relative percent difference

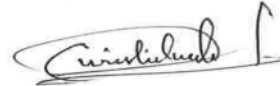
%D Percent difference



## DATA REVIEW

VALIDATION PERFORMED BY: Hrishikesh Upadhyaya

SIGNATURE:



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DATE: March 30, 2021

PEER REVIEW: Andrew Korycinski

DATE: March 30, 2021

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**CHAIN OF CUSTODY  
CORRECTED SAMPLE ANALYSIS DATA  
SHEETS**





# Client Sample Results

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

Job ID: 240-144509-1

**Client Sample ID: TRIP BLANK**

**Lab Sample ID: 240-144509-1**

Date Collected: 02/11/21 00:00

Matrix: Water

Date Received: 02/13/21 08:00

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

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
<del>1,1-Dichloroethene</del>	<del>1.0</del>	<del>U H</del>	<del>1.0</del>	<del>0.19</del>	<del>ug/L</del>			<del>03/15/21 18:10</del>	<del>R 1</del>
<del>cis-1,2-Dichloroethene</del>	<del>1.0</del>	<del>U H</del>	<del>1.0</del>	<del>0.16</del>	<del>ug/L</del>			<del>03/15/21 18:10</del>	<del>R 1</del>
<del>Tetrachloroethene</del>	<del>1.0</del>	<del>U H</del>	<del>1.0</del>	<del>0.15</del>	<del>ug/L</del>			<del>03/15/21 18:10</del>	<del>R 1</del>
<del>trans-1,2-Dichloroethene</del>	<del>1.0</del>	<del>U H</del>	<del>1.0</del>	<del>0.19</del>	<del>ug/L</del>			<del>03/15/21 18:10</del>	<del>R 1</del>
<del>Trichloroethene</del>	<del>1.0</del>	<del>U H</del>	<del>1.0</del>	<del>0.10</del>	<del>ug/L</del>			<del>03/15/21 18:10</del>	<del>R 1</del>
<del>Vinyl chloride</del>	<del>1.0</del>	<del>U H</del>	<del>1.0</del>	<del>0.20</del>	<del>ug/L</del>			<del>03/15/21 18:10</del>	<del>R 1</del>

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	83		75 - 130		03/15/21 18:10	1
4-Bromofluorobenzene (Surr)	96		47 - 134		03/15/21 18:10	1
Toluene-d8 (Surr)	99		69 - 122		03/15/21 18:10	1
Dibromofluoromethane (Surr)	87		78 - 129		03/15/21 18:10	1

**Client Sample ID: MW-149S\_021121**

**Lab Sample ID: 240-144509-2**

Date Collected: 02/11/21 12:10

Matrix: Water

Date Received: 02/13/21 08:00

**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			02/19/21 13:15	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	83		70 - 133		02/19/21 13:15	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			02/22/21 22:22	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 22:22	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 22:22	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 22:22	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 22:22	1
<b>Vinyl chloride</b>	<b>1.7</b>		1.0	0.20	ug/L			02/22/21 22:22	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	113		75 - 130		02/22/21 22:22	1
4-Bromofluorobenzene (Surr)	65		47 - 134		02/22/21 22:22	1
Toluene-d8 (Surr)	78		69 - 122		02/22/21 22:22	1
Dibromofluoromethane (Surr)	126		78 - 129		02/22/21 22:22	1

**Client Sample ID: DUP-15**

**Lab Sample ID: 240-144509-4**

Date Collected: 02/11/21 00:00

Matrix: Water

Date Received: 02/13/21 08:00

**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			02/19/21 12:49	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	84		70 - 133		02/19/21 12:49	1

# Client Sample Results

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

Job ID: 240-144509-1

**Client Sample ID: DUP-15**

**Lab Sample ID: 240-144509-4**

**Date Collected: 02/11/21 00:00**

**Matrix: Water**

**Date Received: 02/13/21 08:00**

**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			02/22/21 21:59	1
cis-1,2-Dichloroethene	1.0	U	1.0	0.16	ug/L			02/22/21 21:59	1
Tetrachloroethene	1.0	U	1.0	0.15	ug/L			02/22/21 21:59	1
trans-1,2-Dichloroethene	1.0	U	1.0	0.19	ug/L			02/22/21 21:59	1
Trichloroethene	1.0	U	1.0	0.10	ug/L			02/22/21 21:59	1
<b>Vinyl chloride</b>	<b>1.7</b>		1.0	0.20	ug/L			02/22/21 21:59	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
1,2-Dichloroethane-d4 (Surr)	115		75 - 130		02/22/21 21:59	1
4-Bromofluorobenzene (Surr)	65		47 - 134		02/22/21 21:59	1
Toluene-d8 (Surr)	81		69 - 122		02/22/21 21:59	1
Dibromofluoromethane (Surr)	121		78 - 129		02/22/21 21:59	1