MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY

INTEROFFICE COMMUNICATION

TO: Mike Jury, Project Manager, Saginaw Bay District Office
Remediation and Redevelopment Division

FROM: Jeff Pincumbe, Geologist, Geological Services Section
Remediation and Redevelopment Division

DATE: October 29, 2018

SUBJECT: River Road PFC Contamination, Iosco County, Site ID #35000154
Sampling Data Package-September 2018, GSS Job #680

This data package is for Part 201 work requested by the Department of Environmental Quality (DEQ), Remediation and Redevelopment Division's (RRD's), Saginaw Bay District Office for the subject site located in Iosco County, Michigan (Fig 1). RRD's Geological Services Section (GSS) collected groundwater samples from 4 monitor wells on September 25, 2018. GSS received the final laboratory results on October 18, 2018.

The data package includes the following:

- Site Location Map (Fig 1)
- Monitor Well Location Map (Fig 2)
- Groundwater Contour Map (Fig 3)
- Sampling Field Data (Table 1)
- Laboratory Tables with Comparison to Action Levels (Table 2)
- Elevation Data (Table 3)
- VISTA Laboratory Results (Appendix A)

On September 25, 2018 GSS collected groundwater samples from 4 monitor wells at the site using a low flow method (Fig 2) (Table 1). The groundwater samples were submitted to VISTA Analytical Laboratory and analyzed for Perfluorinated Hydrocarbons (PFCs) (Table 2) (Appendix A).

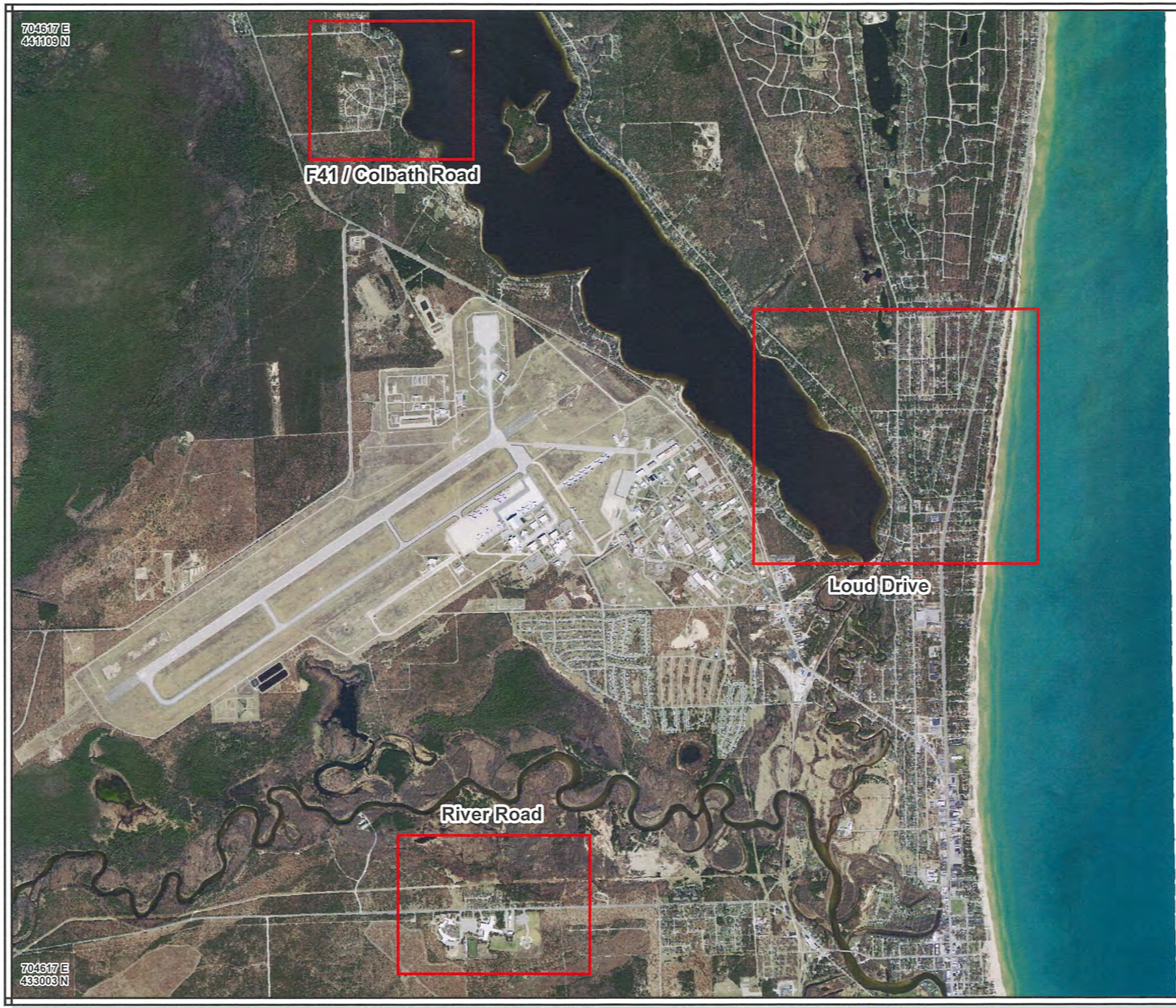
Static water levels were measured at the time of sampling and converted to a top of groundwater elevation (Table 3). Staff used the top of groundwater elevations to create a Groundwater Contour Map (Fig 3) which indicates a groundwater flow direction to the north-northwest.

Laboratory analyses detected PFCs in the groundwater samples collected from RR-MW-4, RR-MW-5, RR-MW-6, and RR-MW-8. The concentration of PFCs in the sample from RR-MW-5 was 99.2 ng/L which exceeds the Action Level of 70 ng/L.

If you have any questions, contact me at 517-243-3171.

Attachments

cc: Burrell P. Shirey, DEQ



LEGEND

- DATUM - NAD83
- PROJECTION: MICHIGAN GEOREF
- NORTHING AND EASTING COORDINATES (IN METERS) ARE IN CORNERS OF MAP

AERIAL PHOTO SOURCE: MI CENTER FOR SHARED SOLUTIONS
AERIAL PHOTO DATE: NA
AERIAL RESOLUTION: USGS Topographic

N
W E
S

0 180 360 720 Meters

0 650 1,300 2,600 Feet

1 inch = 2,667 feet

Wurtsmith Air Force Base
ERNIE ID 53000152, 53000153, 53000154
OSCODA & AU SABLE TOWNSHIPS, IOSCO COUNTY

SITE LOCATIONS MAP

GEOLOGIST		CREATION DATE
Jeff Pincumbe Geological Services Unit	DEQ	October 2018
Remediation and Redevelopment Division		FIGURE 1

LEGEND

- Soil Borings / Monitor Wells

- DATUM - NAD83
- PROJECTION: MICHIGAN GEOREF
- NORTHING AND EASTING COORDINATES (IN METERS) ARE IN CORNERS OF MAP

AERIAL PHOTO SOURCE: MI CENTER FOR SHARED SOLUTIONS
AERIAL PHOTO DATE: 2010
AERIAL RESOLUTION: 1 foot Natural Color

N
W E
S

0 30 60 120 Meters

0 130 260 520 Feet

1 inch = 500 feet

Wurtsmith - River Road
ERNIE ID 35000154
OSCODA & AU SABLE TOWNSHIPS, IOSCO COUNTY
T23N R9E SECTIONS 5 & 6, T24N R9E SECTION 32

SITE MAP

GEOLOGIST		CREATION DATE
Jeff Pincumbe Geological Services Unit	DEQ	January 2017
Remediation and Redevelopment Division		FIGURE 2

LEGEND

- Monitor Well / Soil Boring Location
- September 2018 Contour

- DATUM - NAD83
- PROJECTION: MICHIGAN GEOREF
- NORTHING AND EASTING COORDINATES (IN METERS) ARE IN CORNERS OF MAP

AERIAL PHOTO SOURCE: MI CENTER FOR SHARED SOLUTIONS
AERIAL PHOTO DATE: 2010
AERIAL RESOLUTION: 1 foot Natural Color

N
W E
S

0 30 60 120 Meters

0 130 260 520 Feet

1 inch = 500 feet

Wurtsmith - River Road
ERNIE ID 35000154
OSCODA & AU SABLE TOWNSHIPS, IOSCO COUNTY
T23N R9E SECTIONS 5 & 6, T24N R9E SECTION 32

Groundwater Contour Map
September 25, 2018

GEOLOGIST		CREATION DATE
Jeff Pincumbe Geological Services Unit	DEQ	October 2018
Remediation and Redevelopment Division		FIGURE 3

Sampling Field Data
(September 25, 2018)

River Road PFC Contam.,
Iosco County

(last 5 readings before sampling)

Table #1
(Page 1 of 1)

WELL	SCREEN INTERVAL	DATE	TIME	BEGINNING STATIC	FINAL STATIC	pH ± 0.1					CONDUCTIVITY 3%					Percent Dissolved Oxygen 10%					TURBIDITY 10%				
	ft			ft	ft						mS/cm					%					NTU				
RR-MW-4	21.00	9/25/2018	17:15	15.48	15.50	8.11	8.11	8.10	8.17		0.341	0.339	0.338	0.336		46.4	47.0	46.4	46.7		6.74	2.87	2.09	0.91	
RR-MW-5	18.50	9/25/2018	16:30	12.98	13.00	7.94	7.88	7.79	7.69		0.239	0.231	0.222	0.208		37.2	37.3	39.7	40.0		0.86	0.43	0.16		
RR-MW-6	21.00	9/25/2018	16:30	15.98	16.00	8.21	8.23	8.26	8.27	8.27	0.345	0.318	0.296	0.284	0.279	79.5	75.8	77.8	77.3	77.6	100.8	66.8	36.2	18.3	11.5
RR-MW-8	20.00	9/25/2018	17:15	13.00	13.00	8.24	8.15	8.12	8.18	8.20	0.164	0.160	0.159	0.150	0.151	66.5	66.5	67.4	71.3	70.8	170	140	140	140	140

VISTA Analytical Laboratory Report

Table #2
(Page 1 of 1)

VISTA Work Order No.	1803166
Report Date:	9/18/18
Client:	MDEQ-RRD-SAGINAW BAY
Attention:	Mike Jury
Project Name:	River Road PCE
Location Code:	6B29

Location		RR-MW-4	RR-MW-5	RR-MW-6	RR-MW-8
Depth					
Date		9/25/2018	9/25/2018	9/25/2018	9/25/2018
	Action Level				
Perfluorooctanoic Acid (PFOA)	70 ng/l	ND	**26.1**	ND	**49.7**
Perfluorooctane Sulfonate (PFOS)	70 ng/l	**11.7**	**73.1**	**7.19**	**18.9**
Total PFOA and PFOS	70 ng/l	**11.7**	**99.2**	**7.19**	**68.6**

ND = Not Detected

River Road PFC Contamination, Iosco County

Monitor Wells	Top of Casing (TOC) Elevation	Ground Elevation	Total Depth from TOC	Total Depth from Ground	Static Water Level (TOC) 9/25/18	Groundwater Elevation 9/25/18
RR-MW-3	618.93	619.69	19.10	19.86	NA	NA
RR-MW-4	616.82	917.08	22.00	322.26	15.42	601.40
RR-MW-5	619.37	619.63	18.30	18.56	12.98	606.39
RR-MW-6	618.88	916.64	21.00	318.77	15.98	602.90
RR-MW-7	619.22	619.48	21.35	21.61	NA	NA
RR-MW-8	616.30	616.01	20.00	20.30	13.00	603.30
RR-B-3	NA	612.26	NA			

NA = Not Available

APPENDIX A

River Road PFC Contamination, Iosco County
Site ID #35000154

VISTA Analytical Laboratory Results

October 18, 2018

Vista Work Order No. 1803166

Ms. Maya Murshak
Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Dear Ms. Murshak,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on September 27, 2018 under your Project Name 'River Road 35000154'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at mmaier@vista-analytical.com.

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

Martha Maier
Laboratory Director

Vista Work Order No. 1803166
Case Narrative

Sample Condition on Receipt:

Four water samples were received in good condition and within the method temperature requirements. The samples were received and stored securely in accordance with Vista standard operating procedures and EPA methodology. The COC discrepancy was resolved as directed.

Analytical Notes:

PFAS Isotope Dilution Method

Sample "DEQ-RR-MW-8" contained particulate and was centrifuged prior to extraction.

The samples were extracted and analyzed for a selected list of PFAS using the PFAS Isotope Dilution Method (Modified EPA Method 537). The results for PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Results for all other analytes include the linear isomers only.

Holding Times

The samples were extracted and analyzed within the method hold times.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected in the Method Blank above 1/2 the LOQ. The OPR recoveries were within the method acceptance criteria.

The labeled standard recoveries for all QC and field samples were within the acceptance criteria.

TABLE OF CONTENTS

Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1803166-01	DEQ-RR-MW-4	25-Sep-18 17:20	27-Sep-18 11:31	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1803166-02	DEQ-RR-MW-5	25-Sep-18 16:30	27-Sep-18 11:31	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1803166-03	DEQ-RR-MW-6	25-Sep-18 16:30	27-Sep-18 11:31	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL
1803166-04	DEQ-RR-MW-8	25-Sep-18 17:05	27-Sep-18 11:31	HDPE Bottle, 250 mL
				HDPE Bottle, 250 mL

ANALYTICAL RESULTS

Sample ID: Method Blank

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: River Road 35000154
Matrix: Aqueous

Laboratory Data

Lab Sample: B8I0213-BLK1
Column: BEH C18

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
L-PFBA	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
L-PFPeA	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
L-PFBS	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
L-4:2 FTS	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
L-PFHxA	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
L-PFPeS	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
L-PFHpA	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
L-PFHxS	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
Br-PFHxS	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
Total PFHxS	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
L-6:2 FTS	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
L-PFOA	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
Br-PFOA	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
Total PFOA	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
L-PFHpS	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
L-PFNA	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
L-PFOSA	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
L-PFOS	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
Br-PFOS	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
Total PFOS	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
L-PFDA	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
L-8:2FTS	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
L-PFNS	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
L-MeFOSAA	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
Br-MeFOSAA	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
Total MeFOSAA	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
L-EtFOSAA	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
Br-EtFOSAA	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
Total EtFOSAA	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
L-PFUnA	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
L-PFDS	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
L-PFDoA	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
L-PFTrDA	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
L-PFTeDA	ND	1.37	2.00	4.00		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	107	60 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
13C3-PFPeA	IS	103	60 - 150		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
13C3-PFBS	IS	114	60 - 150		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1

Sample ID: Method Blank **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc. Matrix: Aqueous

Project: River Road 35000154

Laboratory Data

Lab Sample: B8I0213-BLK1 Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-4:2 FTS	IS	137	40 - 150		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
13C2-PFHxA	IS	113	70 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
13C4-PFHpA	IS	119	60 - 150		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
18O2-PFHxS	IS	112	60 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
13C2-6:2 FTS	IS	126	40 - 150		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
13C2-PFOA	IS	99.1	60 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
13C5-PFNA	IS	70.0	50 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
13C8-PFOSA	IS	38.3	20 - 150		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
13C8-PFOS	IS	100	60 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
13C2-PFDA	IS	67.5	60 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
13C2-8:2 FTS	IS	109	40 - 150		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
d3-MeFOSAA	IS	79.0	50 - 150		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
d5-EtFOSAA	IS	86.3	50 - 150		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
13C2-PFUnA	IS	77.0	60 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
13C2-PFDoA	IS	85.4	30 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1
13C2-PFTeDA	IS	103	20 - 150		B8I0213	08-Oct-18	0.250 L	17-Oct-18 03:04	1

DL - Detection Limit LOD - Limit of Detection Results reported to the DL.

LOQ - Limit of quantitation

Sample ID: OPR **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: River Road 35000154
Matrix: Aqueous

Laboratory Data

Lab Sample: B8I0213-BS1
Column: BEH C18

Analyte	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
L-PFBA	38.0	40.0	95.1	70 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
L-PFPeA	39.2	40.0	98.1	70 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
L-PFBS	37.4	40.0	93.5	70 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
L-4:2 FTS	33.0	40.0	82.6	60 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
L-PFHxA	36.0	40.0	89.9	70 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
L-PFPeS	34.6	40.0	86.6	70 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
L-PFHpA	36.0	40.0	90.1	70 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
Total PFHxS	39.1	40.0	97.8	70 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
L-6:2 FTS	30.7	40.0	76.8	60 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
Total PFOA	33.5	40.0	83.8	70 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
L-PFHpS	40.6	40.0	102	60 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
L-PFNA	38.3	40.0	95.8	70 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
L-PFOSA	37.8	40.0	94.6	70 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
Total PFOS	36.9	40.0	92.3	70 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
L-PFDA	34.8	40.0	86.9	70 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
L-8:2FTS	36.9	40.0	92.2	60 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
L-PFNS	38.1	40.0	95.3	70 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
Total MeFOSAA	38.4	40.0	96.1	70 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
Total EtFOSAA	37.1	40.0	92.7	70 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
L-PFUnA	37.4	40.0	93.4	70 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
L-PFDS	33.7	40.0	84.1	60 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
L-PFDoA	38.1	40.0	95.2	70 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
L-PFTrDA	34.7	40.0	86.9	60 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
L-PFTeDA	31.0	40.0	77.6	70 - 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	101	60- 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
13C3-PFPeA	IS	98.6	60- 150		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
13C3-PFBS	IS	114	60- 150		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
13C2-4:2 FTS	IS	128	40- 150		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
13C2-PFHxA	IS	106	70- 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
13C4-PFHpA	IS	115	60- 150		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
18O2-PFHxS	IS	105	60- 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
13C2-6:2 FTS	IS	124	40- 150		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
13C2-PFOA	IS	95.6	60- 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
13C5-PFNA	IS	71.8	50- 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1

Sample ID: OPR **PFAS Isotope Dilution Method**

Client Data

Name: Merit Laboratories, Inc.
Project: River Road 35000154
Matrix: Aqueous

Laboratory Data

Lab Sample: B8I0213-BS1
Column: BEH C18

Labeled Standards	Type	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C8-PFOSA	IS	41.5	20- 150		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
13C8-PFOS	IS	94.5	60- 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
13C2-PFDA	IS	73.2	60- 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
13C2-8:2 FTS	IS	106	40- 150		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
d3-MeFOSAA	IS	81.3	50- 150		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
d5-EtFOSAA	IS	85.5	50- 150		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
13C2-PFUnA	IS	78.3	60- 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
13C2-PFDoA	IS	82.8	30- 130		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1
13C2-PFTeDA	IS	93.8	20- 150		B8I0213	08-Oct-18	0.250 L	17-Oct-18 02:54	1

Sample ID: DEQ-RR-MW-4

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: River Road 35000154
Location: River Road

Matrix: Water
Date Collected: 25-Sep-18 17:20

Laboratory Data

Lab Sample: 1803166-01
Date Received: 27-Sep-18 11:31

Column: BEH C18

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
L-PFBA	3.92	1.40	2.04	4.08	J	B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
L-PFPeA	ND	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
L-PFBS	222	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
L-4:2 FTS	ND	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
L-PFHxA	ND	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
L-PFPeS	ND	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
L-PFHpA	ND	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
L-PFHxS	1.72	1.40	2.04	4.08	J	B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
Br-PFHxS	ND	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
Total PFHxS	1.72	1.40	2.04	4.08	J	B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
L-6:2 FTS	ND	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
L-PFOA	ND	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
Br-PFOA	ND	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
Total PFOA	ND	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
L-PFHpS	ND	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
L-PFNA	ND	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
L-PFOSA	ND	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
L-PFOS	7.53	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
Br-PFOS	4.21	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
Total PFOS	11.7	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
L-PFDA	ND	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
L-8:2FTS	ND	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
L-PFNS	ND	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
L-MeFOSAA	ND	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
Br-MeFOSAA	ND	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
Total MeFOSAA	ND	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
L-EtFOSAA	ND	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
Br-EtFOSAA	ND	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
Total EtFOSAA	ND	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
L-PFUnA	ND	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
L-PFDS	ND	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
L-PFDoA	ND	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
L-PFTrDA	ND	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
L-PFTeDA	ND	1.40	2.04	4.08		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	105	60 - 130		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
13C3-PFPeA	IS	95.5	60 - 150		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
13C3-PFBS	IS	101	60 - 150		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1

Sample ID: DEQ-RR-MW-4

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: River Road 35000154
Location: River Road
Matrix: Water
Date Collected: 25-Sep-18 17:20

Laboratory Data

Lab Sample: 1803166-01
Date Received: 27-Sep-18 11:31
Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-4:2 FTS	IS	123	40 - 150		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
13C2-PFHxA	IS	107	70 - 130		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
13C4-PFHpA	IS	127	60 - 150		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
18O2-PFHxS	IS	107	60 - 130		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
13C2-6:2 FTS	IS	119	40 - 150		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
13C2-PFOA	IS	109	60 - 130		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
13C5-PFNA	IS	86.2	50 - 130		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
13C8-PFOSA	IS	36.6	20 - 150		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
13C8-PFOS	IS	106	60 - 130		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
13C2-PFDA	IS	77.3	60 - 130		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
13C2-8:2 FTS	IS	106	40 - 150		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
d3-MeFOSAA	IS	72.8	50 - 150		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
d5-EtFOSAA	IS	76.8	50 - 150		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
13C2-PFUnA	IS	76.1	60 - 130		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
13C2-PFDoA	IS	79.4	30 - 130		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1
13C2-PFTeDA	IS	99.8	20 - 150		B8I0213	08-Oct-18	0.245 L	17-Oct-18 05:43	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
Results reported to the DL.

Sample ID: DEQ-RR-MW-5

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: River Road 35000154
Location: River Road
Matrix: Water
Date Collected: 25-Sep-18 16:30

Laboratory Data

Lab Sample: 1803166-02
Date Received: 27-Sep-18 11:31
Column: BEH C18

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
L-PFBA	79.6	1.38	2.02	4.03		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
L-PFPeA	184	1.38	2.02	4.03		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
L-PFBS	524	1.38	2.02	4.03		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
L-4:2 FTS	ND	1.38	2.02	4.03		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
L-PFHxA	104	1.38	2.02	4.03		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
L-PFPeS	2.89	1.38	2.02	4.03	J	B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
L-PFHpA	12.0	1.38	2.02	4.03		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
L-PFHxS	9.84	1.38	2.02	4.03		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
Br-PFHxS	1.73	1.38	2.02	4.03	J	B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
Total PFHxS	11.6	1.38	2.02	4.03		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
L-6:2 FTS	ND	1.38	2.02	4.03		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
L-PFOA	23.6	1.38	2.02	4.03		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
Br-PFOA	2.52	1.38	2.02	4.03	J	B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
Total PFOA	26.1	1.38	2.02	4.03		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
L-PFHpS	1.59	1.38	2.02	4.03	J	B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
L-PFNA	ND	1.38	2.02	4.03		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
L-PFOSA	24.7	1.38	2.02	4.03		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
L-PFOS	52.7	1.38	2.02	4.03		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
Br-PFOS	20.4	1.38	2.02	4.03		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
Total PFOS	73.1	1.38	2.02	4.03		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
L-PFDA	2.03	1.38	2.02	4.03	J	B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
L-8:2FTS	ND	1.38	2.02	4.03		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
L-PFNS	ND	1.38	2.02	4.03		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
L-MeFOSAA	ND	1.38	2.02	4.03		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
Br-MeFOSAA	ND	1.38	2.02	4.03		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
Total MeFOSAA	ND	1.38	2.02	4.03		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
L-EtFOSAA	ND	1.38	2.02	4.03		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
Br-EtFOSAA	ND	1.38	2.02	4.03		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
Total EtFOSAA	ND	1.38	2.02	4.03		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
L-PFUnA	ND	1.38	2.02	4.03		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
L-PFDS	5.32	1.38	2.02	4.03		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
L-PFDoA	ND	1.38	2.02	4.03		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
L-PFTrDA	ND	1.38	2.02	4.03		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
L-PFTeDA	ND	1.38	2.02	4.03		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	107	60 - 130		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
13C3-PFPeA	IS	91.1	60 - 150		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
13C3-PFBS	IS	95.1	60 - 150		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1

Sample ID: DEQ-RR-MW-5

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: River Road 35000154
Location: River Road

Matrix: Water
Date Collected: 25-Sep-18 16:30

Laboratory Data

Lab Sample: 1803166-02
Date Received: 27-Sep-18 11:31

Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-4:2 FTS	IS	122	40 - 150		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
13C2-PFHxA	IS	106	70 - 130		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
13C4-PFHpA	IS	132	60 - 150		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
18O2-PFHxS	IS	105	60 - 130		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
13C2-6:2 FTS	IS	114	40 - 150		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
13C2-PFOA	IS	113	60 - 130		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
13C5-PFNA	IS	87.8	50 - 130		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
13C8-PFOSA	IS	27.9	20 - 150		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
13C8-PFOS	IS	100	60 - 130		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
13C2-PFDA	IS	72.6	60 - 130		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
13C2-8:2 FTS	IS	106	40 - 150		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
d3-MeFOSAA	IS	74.2	50 - 150		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
d5-EtFOSAA	IS	78.9	50 - 150		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
13C2-PFUnA	IS	78.0	60 - 130		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
13C2-PFDoA	IS	81.6	30 - 130		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1
13C2-PFTeDA	IS	114	20 - 150		B8I0213	08-Oct-18	0.248 L	17-Oct-18 05:54	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
Results reported to the DL.

Sample ID: DEQ-RR-MW-6

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: River Road 35000154
Location: River Road
Matrix: Water
Date Collected: 25-Sep-18 16:30

Laboratory Data

Lab Sample: 1803166-03
Date Received: 27-Sep-18 11:31
Column: BEH C18

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
L-PFBA	2.12	1.41	2.07	4.13	J	B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
L-PFPeA	1.41	1.41	2.07	4.13	J	B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
L-PFBS	ND	1.41	2.07	4.13		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
L-4:2 FTS	ND	1.41	2.07	4.13		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
L-PFHxA	1.82	1.41	2.07	4.13	J	B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
L-PFPeS	ND	1.41	2.07	4.13		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
L-PFHpA	ND	1.41	2.07	4.13		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
L-PFHxS	3.01	1.41	2.07	4.13	J	B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
Br-PFHxS	ND	1.41	2.07	4.13		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
Total PFHxS	3.01	1.41	2.07	4.13	J	B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
L-6:2 FTS	ND	1.41	2.07	4.13		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
L-PFOA	ND	1.41	2.07	4.13		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
Br-PFOA	ND	1.41	2.07	4.13		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
Total PFOA	ND	1.41	2.07	4.13		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
L-PFHpS	ND	1.41	2.07	4.13		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
L-PFNA	ND	1.41	2.07	4.13		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
L-PFOSA	ND	1.41	2.07	4.13		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
L-PFOS	5.74	1.41	2.07	4.13		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
Br-PFOS	1.45	1.41	2.07	4.13	J	B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
Total PFOS	7.19	1.41	2.07	4.13		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
L-PFDA	ND	1.41	2.07	4.13		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
L-8:2FTS	ND	1.41	2.07	4.13		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
L-PFNS	ND	1.41	2.07	4.13		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
L-MeFOSAA	ND	1.41	2.07	4.13		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
Br-MeFOSAA	ND	1.41	2.07	4.13		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
Total MeFOSAA	ND	1.41	2.07	4.13		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
L-EtFOSAA	ND	1.41	2.07	4.13		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
Br-EtFOSAA	ND	1.41	2.07	4.13		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
Total EtFOSAA	ND	1.41	2.07	4.13		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
L-PFUnA	ND	1.41	2.07	4.13		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
L-PFDS	ND	1.41	2.07	4.13		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
L-PFDoA	ND	1.41	2.07	4.13		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
L-PFTrDA	ND	1.41	2.07	4.13		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
L-PFTeDA	ND	1.41	2.07	4.13		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	107	60 - 130		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
13C3-PFPeA	IS	93.2	60 - 150		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
13C3-PFBS	IS	111	60 - 150		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1

Sample ID: DEQ-RR-MW-6

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: River Road 35000154
Location: River Road

Matrix: Water
Date Collected: 25-Sep-18 16:30

Laboratory Data

Lab Sample: 1803166-03
Date Received: 27-Sep-18 11:31

Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-4:2 FTS	IS	126	40 - 150		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
13C2-PFHxA	IS	111	70 - 130		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
13C4-PFHpA	IS	137	60 - 150		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
18O2-PFHxS	IS	109	60 - 130		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
13C2-6:2 FTS	IS	121	40 - 150		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
13C2-PFOA	IS	114	60 - 130		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
13C5-PFNA	IS	84.4	50 - 130		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
13C8-PFOSA	IS	34.5	20 - 150		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
13C8-PFOS	IS	102	60 - 130		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
13C2-PFDA	IS	80.9	60 - 130		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
13C2-8:2 FTS	IS	109	40 - 150		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
d3-MeFOSAA	IS	89.2	50 - 150		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
d5-EtFOSAA	IS	91.3	50 - 150		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
13C2-PFUnA	IS	90.3	60 - 130		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
13C2-PFDoA	IS	93.7	30 - 130		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1
13C2-PFTeDA	IS	125	20 - 150		B8I0213	08-Oct-18	0.242 L	17-Oct-18 06:04	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
Results reported to the DL.

Sample ID: DEQ-RR-MW-8

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: River Road 35000154
Location: River Road
Matrix: Water
Date Collected: 25-Sep-18 17:05

Laboratory Data

Lab Sample: 1803166-04
Date Received: 27-Sep-18 11:31
Column: BEH C18

Analyte	Conc. (ng/L)	DL	LOD	LOQ	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
L-PFBA	2.92	1.32	1.93	3.86	J	B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
L-PFPeA	7.76	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
L-PFBS	7.10	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
L-4:2 FTS	ND	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
L-PFHxA	9.26	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
L-PFPeS	ND	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
L-PFHpA	7.70	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
L-PFHxS	7.56	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
Br-PFHxS	ND	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
Total PFHxS	7.85	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
L-6:2 FTS	ND	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
L-PFOA	47.7	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
Br-PFOA	2.01	1.32	1.93	3.86	J	B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
Total PFOA	49.7	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
L-PFHpS	ND	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
L-PFNA	ND	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
L-PFOSA	ND	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
L-PFOS	13.2	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
Br-PFOS	5.70	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
Total PFOS	18.9	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
L-PFDA	ND	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
L-8:2FTS	ND	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
L-PFNS	ND	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
L-MeFOSAA	ND	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
Br-MeFOSAA	ND	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
Total MeFOSAA	ND	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
L-EtFOSAA	ND	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
Br-EtFOSAA	ND	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
Total EtFOSAA	ND	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
L-PFUnA	ND	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
L-PFDS	ND	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
L-PFDoA	ND	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
L-PFTrDA	ND	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
L-PFTeDA	ND	1.32	1.93	3.86		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C3-PFBA	IS	103	60 - 130		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
13C3-PFPeA	IS	95.1	60 - 150		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
13C3-PFBS	IS	109	60 - 150		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1

Sample ID: DEQ-RR-MW-8

PFAS Isotope Dilution Method

Client Data

Name: Merit Laboratories, Inc.
Project: River Road 35000154
Location: River Road

Matrix: Water
Date Collected: 25-Sep-18 17:05

Laboratory Data

Lab Sample: 1803166-04
Date Received: 27-Sep-18 11:31

Column: BEH C18

Labeled Standards	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-4:2 FTS	IS	122	40 - 150		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
13C2-PFHxA	IS	104	70 - 130		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
13C4-PFHpA	IS	120	60 - 150		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
18O2-PFHxS	IS	109	60 - 130		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
13C2-6:2 FTS	IS	113	40 - 150		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
13C2-PFOA	IS	106	60 - 130		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
13C5-PFNA	IS	88.2	50 - 130		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
13C8-PFOSA	IS	42.5	20 - 150		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
13C8-PFOS	IS	99.2	60 - 130		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
13C2-PFDA	IS	74.5	60 - 130		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
13C2-8:2 FTS	IS	100	40 - 150		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
d3-MeFOSAA	IS	81.1	50 - 150		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
d5-EtFOSAA	IS	83.4	50 - 150		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
13C2-PFUnA	IS	87.9	60 - 130		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
13C2-PFDoA	IS	87.2	30 - 130		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1
13C2-PFTeDA	IS	112	20 - 150		B8I0213	08-Oct-18	0.259 L	17-Oct-18 06:15	1

DL - Detection Limit
LOD - Limit of Detection
LOQ - Limit of quantitation
Results reported to the DL.

DATA QUALIFIERS & ABBREVIATIONS

B	**This compound was also detected in the method blank**
Conc.	**Concentration**
D	**Dilution**
DL	**Detection limit**
E	**The associated compound concentration exceeded the calibration range of the instrument**
H	**Recovery and/or RPD was outside laboratory acceptance limits**
I	**Chemical Interference**
J	**The amount detected is below the Reporting Limit/LOQ**
LOD	**Limits of Detection**
LOQ	**Limits of Quantitation**
M	**Estimated Maximum Possible Concentration (CA Region 2 projects only)**
NA	**Not applicable**
ND	**Not Detected**
Q	**Ion ratio outside of 70-130% of Standard Ratio. (DOD PFAS projects only)**
TEQ	**Toxic Equivalency**
U	**Not Detected (specific projects only)**
*****	**See Cover Letter**

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

CERTIFICATIONS

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	18-008-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777-18
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2018017
Minnesota Department of Health	1322288
New Hampshire Environmental Accreditation Program	207717
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-009
Pennsylvania Department of Environmental Protection	014
Texas Commission on Environmental Quality	T104704189-18-8
Virginia Department of General Services	9077
Washington Department of Ecology	C584
Wisconsin Department of Natural Resources	998036160

Current certificates and lists of licensed parameters are located in the Quality Assurance office and are available upon request.

NELAP Accredited Test Methods

MATRIX: Air	
Description of Test	**Method**
Determination of Polychlorinated p-Dioxins & Polychlorinated Dibenzofurans	EPA 23

MATRIX: Biological Tissue	
Description of Test	**Method**
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Drinking Water	
Description of Test	**Method**
2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS	EPA 1613
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537

MATRIX: Non-Potable Water	
Description of Test	**Method**
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Pesticides in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS	EPA 1699
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Dioxin by GC/HRMS	EPA 613
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

MATRIX: Solids	
Description of Test	**Method**
Tetra-Octa Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution GC/HRMS	EPA 1613B
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue by GC/HRMS	EPA 1668A/C
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Polychlorinated Dibenzo-p-Dioxins and Polychlorinated Dibenzofurans by GC/HRMS	EPA 8280A/B
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by GC/HRMS	EPA 8290/8290A

Michigan Department of Environmental Quality
Laboratory Services Section

Analysis Request Sheet

1803166 VSSB 9/27/18 4.0°C

Lab Work Order Number	Project Name	Matrix
	River Road	WATER

Site Code/Project Number	AY	CC Email 1	Project TAT Days	Sample Collector
35000154		pincumbej @ MICHIGAN.GOV		Jeff Pincumbe
Dept-Division-District	**Index**	**CC Email 2**	**Project Due Date**	**Sample Collector Phone**
DEQ-RRD-Sag-Bay	6B29	shireyb @ MICHIGAN.GOV		517-243-3171
State Project Manager	**PCA**	**CC Email 3**		**Contract Firm**
Mike Jury				
State Project Manager Email	**Project**	**Overflow Lab Choice 1**	**Accept Analysis hold time codes**	**Contract Firm Primary Contact**
jurym1 @ MICHIGAN.GOV				
State Project Manager Phone	**Phase**	**Overflow Lab Choice 2**		**Primary Contact Phone**
989-894-6255				

	Lab Use Only	Field Sample Identification	Collection Date	Collection Time	Container Count	Comments
1		DEQ-RR-MW-4		1720		PFAS ANALYSIS
2		DEQ-RR-MW-5		1630		
3		DEQ-RR-MW-6		1630		
4		DEQ-RR-MW-8		1705		
5						
6						
7						
8						
9						
10						

ORGANIC CHEMISTRY

VOA - Volatile Organic Acidic
Volatiles - Full List 1 2 3 4 5 6 7 8 9 10
BTEX/MTBE/TMB only 1 2 3 4 5 6 7 8 9 10
Chlorinated only 1 2 3 4 5 6 7 8 9 10
GRO 1 2 3 4 5 6 7 8 9 10
1,4 Dioxane 1 2 3 4 5 6 7 8 9 10

METH - Methane, Ethane, Ethene
Methane, Ethane, Ethene 1 2 3 4 5 6 7 8 9 10

ON - Pesticides, PCBs
Pesticides & PCBs 1 2 3 4 5 6 7 8 9 10
Pesticides only 1 2 3 4 5 6 7 8 9 10
PCBs only 1 2 3 4 5 6 7 8 9 10
Toxaphene 1 2 3 4 5 6 7 8 9 10
Chlordane 1 2 3 4 5 6 7 8 9 10

BNA - Base Neutral Acids
BNAs 1 2 3 4 5 6 7 8 9 10
Benzidines 1 2 3 4 5 6 7 8 9 10
PNAs only 1 2 3 4 5 6 7 8 9 10
BNs only 1 2 3 4 5 6 7 8 9 10
Acids only 1 2 3 4 5 6 7 8 9 10

Organic Specialty Requests
Library search - Volatiles 1 2 3 4 5 6 7 8 9 10
Library search - SemiVols 1 2 3 4 5 6 7 8 9 10
Finger Print 1 2 3 4 5 6 7 8 9 10
DRO / ORO 1 2 3 4 5 6 7 8 9 10

METALS CHEMISTRY PACKAGES

OpMemo2 - Total 1 2 3 4 5 6 7 8 9 10
OpMemo2 - Dissolved 1 2 3 4 5 6 7 8 9 10
(Sb,As,Ba,Be,Cd,Cr,Cu,Co,Fe,Pb,Mn,Hg,Mo,Ni,Se,Ag,Tl,V,Zn)
Michigan10 - Total 1 2 3 4 5 6 7 8 9 10
Michigan10 - Dissolved 1 2 3 4 5 6 7 8 9 10
(As,Ba,Cd,Cr,Cu,Pb,Hg,Se,Ag,Zn)

MAD - DISSOLVED METALS

Diss - Silver - Ag 1 2 3 4 5 6 7 8 9 10
Diss - Aluminum - Al 1 2 3 4 5 6 7 8 9 10
Diss - Arsenic - As 1 2 3 4 5 6 7 8 9 10
Diss - Boron - B 1 2 3 4 5 6 7 8 9 10
Diss - Barium - Ba 1 2 3 4 5 6 7 8 9 10
Diss - Beryllium - Be 1 2 3 4 5 6 7 8 9 10
Diss - Cadmium - Cd 1 2 3 4 5 6 7 8 9 10
Diss - Cobalt - Co 1 2 3 4 5 6 7 8 9 10
Diss - Chromium - Cr 1 2 3 4 5 6 7 8 9 10
Diss - Copper - Cu 1 2 3 4 5 6 7 8 9 10
Diss - Iron - Fe 1 2 3 4 5 6 7 8 9 10
Diss - Mercury - Hg 1 2 3 4 5 6 7 8 9 10
Diss - Lithium - Li 1 2 3 4 5 6 7 8 9 10
Diss - Manganese - Mn 1 2 3 4 5 6 7 8 9 10
Diss - Molybdenum - Mo 1 2 3 4 5 6 7 8 9 10
Diss - Nickel - Ni 1 2 3 4 5 6 7 8 9 10
Diss - Lead - Pb 1 2 3 4 5 6 7 8 9 10
Diss - Antimony - Sb 1 2 3 4 5 6 7 8 9 10
Diss - Selenium - Se 1 2 3 4 5 6 7 8 9 10
Diss - Strontium - Sr 1 2 3 4 5 6 7 8 9 10
Diss - Titanium - Ti 1 2 3 4 5 6 7 8 9 10
Diss - Thallium - Tl 1 2 3 4 5 6 7 8 9 10
Diss - Uranium - U 1 2 3 4 5 6 7 8 9 10
Diss - Vanadium - V 1 2 3 4 5 6 7 8 9 10
Diss - Zinc - Zn 1 2 3 4 5 6 7 8 9 10
Diss - Calcium - Ca 1 2 3 4 5 6 7 8 9 10
Diss - Potassium - K 1 2 3 4 5 6 7 8 9 10
Diss - Magnesium - Mg 1 2 3 4 5 6 7 8 9 10
Diss - Sodium - Na 1 2 3 4 5 6 7 8 9 10
Diss - Hardness - Ca, Mg 1 2 3 4 5 6 7 8 9 10

MD - Metals Dissolved
Lab Filtration 1 2 3 4 5 6 7 8 9 10

MA - TOTAL METALS

Silver - Ag 1 2 3 4 5 6 7 8 9 10
Aluminum - Al 1 2 3 4 5 6 7 8 9 10
Arsenic - As 1 2 3 4 5 6 7 8 9 10
Boron - B 1 2 3 4 5 6 7 8 9 10
Barium - Ba 1 2 3 4 5 6 7 8 9 10
Beryllium - Be 1 2 3 4 5 6 7 8 9 10
Cadmium - Cd 1 2 3 4 5 6 7 8 9 10
Cobalt - Co 1 2 3 4 5 6 7 8 9 10
Chromium - Cr 1 2 3 4 5 6 7 8 9 10
Copper - Cu 1 2 3 4 5 6 7 8 9 10
Iron - Fe 1 2 3 4 5 6 7 8 9 10
Mercury - Hg 1 2 3 4 5 6 7 8 9 10
Lithium - Li 1 2 3 4 5 6 7 8 9 10
Manganese - Mn 1 2 3 4 5 6 7 8 9 10
Molybdenum - Mo 1 2 3 4 5 6 7 8 9 10
Nickel - Ni 1 2 3 4 5 6 7 8 9 10
Lead - Pb 1 2 3 4 5 6 7 8 9 10
Antimony - Sb 1 2 3 4 5 6 7 8 9 10
Selenium - Se 1 2 3 4 5 6 7 8 9 10
Strontium - Sr 1 2 3 4 5 6 7 8 9 10
Titanium - Ti 1 2 3 4 5 6 7 8 9 10
Thallium - Tl 1 2 3 4 5 6 7 8 9 10
Uranium - U 1 2 3 4 5 6 7 8 9 10
Vanadium - V 1 2 3 4 5 6 7 8 9 10
Zinc - Zn 1 2 3 4 5 6 7 8 9 10
Calcium - Ca 1 2 3 4 5 6 7 8 9 10
Potassium - K 1 2 3 4 5 6 7 8 9 10
Magnesium - Mg 1 2 3 4 5 6 7 8 9 10
Sodium - Na 1 2 3 4 5 6 7 8 9 10
Hardness - Ca, Mg 1 2 3 4 5 6 7 8 9 10

LHG - Low Level Mercury
Mercury Low Level - Hg 1 2 3 4 5 6 7 8 9 10

GENERAL CHEMISTRY

GB Total Cyanide - CN 1 2 3 4 5 6 7 8 9 10
GB Amenable Cyanide - CN 1 2 3 4 5 6 7 8 9 10
GCN Available Cyanide - CN 1 2 3 4 5 6 7 8 9 10
CA Chlorophyll 1 2 3 4 5 6 7 8 9 10
GN Ortho Phosphate - OP 1 2 3 4 5 6 7 8 9 10
GN Nitrite - NO_2 1 2 3 4 5 6 7 8 9 10
GN Nitrate - NO_3 (Calc.) 1 2 3 4 5 6 7 8 9 10
GN Suspended Solids - SS 1 2 3 4 5 6 7 8 9 10
GN Dissolved Solids - TDS 1 2 3 4 5 6 7 8 9 10
MN Diss Solids - TDS (Calc.) 1 2 3 4 5 6 7 8 9 10
GN Turbidity 1 2 3 4 5 6 7 8 9 10
MN Total Alkalinity 1 2 3 4 5 6 7 8 9 10
MN Bicarb/Carb Alkalinity (includes Total Alkalinity) 1 2 3 4 5 6 7 8 9 10
MN Chloride - Cl 1 2 3 4 5 6 7 8 9 10
MN Fluoride - F 1 2 3 4 5 6 7 8 9 10
MN Sulfate - SO4 1 2 3 4 5 6 7 8 9 10
MN Chromium 6 - Cr+6 1 2 3 4 5 6 7 8 9 10
MN Conductivity 1 2 3 4 5 6 7 8 9 10
MN pH 1 2 3 4 5 6 7 8 9 10
GA Chem Oxyg Dem - COD 1 2 3 4 5 6 7 8 9 10
GA Diss Org Carbon - DOC (FF) (Field - Filtered & Preserved) 1 2 3 4 5 6 7 8 9 10
GN Diss Org Carbon - DOC (LF) (Lab - Filtered & Preserved) 1 2 3 4 5 6 7 8 9 10
GA Total Org Carbon - TOC 1 2 3 4 5 6 7 8 9 10
GA Ammonia - NH3 1 2 3 4 5 6 7 8 9 10
GA Nitrate+Nitrite - NO3+NO2 1 2 3 4 5 6 7 8 9 10
GA Kjeldahl Nitrogen - KN 1 2 3 4 5 6 7 8 9 10
GA Total Phosphorus - TP 1 2 3 4 5 6 7 8 9 10

Chain of Custody

Relinquished by	Received By	Date / Time
Print Name & Org. Jeff Pincumbe - MDEQ	B. Benedict VAL	09/27/18 1152
Signature: Jeff Pincumbe	Brett Benedict	
Print Name & Org.		
Signature:		
Print Name & Org.		
Signature:		

Vista Analytical Laboratory

Sample Log in Checklist

PAGE # 1 of 1

WO# 1803166

SDG# —

TAT Std

Section 1: Container Receipt

Delivered By: ☐ FedEx ☐ UPS ☐ On Trac ☐ GSO ☐ DHL ☐ Hand Delivered ☐ Other:

Number of Containers	Arrival Date	Arrival time	Cooler Received LR-SLC Initiated By/Date
1	9/24/18	1131	BLB 9/27/18

Section 2: Sample Receipt Condition and Initial Storage

Container Condition	Chain of Custody	Preservation Type	Temperature	Storage Location	Initials/ Date
☑ Shipping container intact ☒ Shipping seals intact ☐ Custody Seals present ☐ Custody seals intact	☑ COC present ☒ Multiple COC's: 3 ☒ "Relinquished By" Section complete	☒ Ice ☐ Blue Ice ☐ Dry Ice ☐ Other	Thermometer ID: **IR-4** ☐ Probe used Temp (uncorrected): 4.1 °C Temp (corrected): 4.0 °C	☒ WR2 ☐ WF2 ☐ NA	BLB 9/27/18

Section 3: Sample Log In

Airbill/Trk # 1Z 4XX 260 22 1001 5025

	By/date
Shipping container ☐ Vista ☒ Client ☐ Retain ☒ Return ☐ Dispose	
Log In Time: 1359	BLB 9/27/18
COC clearly identifies: • Sample name • Sample matrix • Test method • Sample collection date or time* Missing the collection date. MSB • Collector's name • Preservation type	☐ Acceptable ☒ Not acceptable – anomaly form required BLB 9/27/18
All samples present and accounted for on COC	BLB 9/27/18
Sample IDs are legible	BLB 9/27/18
Samples conform to the description on the COC	BLB 9/27/18
Samples are intact and suitable for testing	BLB 9/27/18
Preservation documented as required: ☒ NA ☐ $Na_2S_2O_3$ ☐ Trizma ☐ Other _____	BLB 9/24/18
Samples stored ☒ WR2 Shelf: E4/F4 ☐ WF2 Shelf: _____ ☐ R1 Shelf: _____	

Comments: SAMPLE LABEL: DEQ-RR-MW-4 DATE: 9/25/18 TIME: Not Present
MW-6 9/25/18 " "
MW-8 9/25/18 1715
MW-5 9/25/18 1630

Chain of Custody Anomaly/Sample Acceptance Form

Vista Analytical Laboratory

Client:	Merit Laboratories, Inc.	Workorder Number:	1803166
Contact:	Maya Murshak	Date Received:	27-Sep-18 11:31
Email:	mayamurshak@meritlabs.com	Documented by/date:	B.Benedict 09/27/2018
Phone:	(517) 827-2744		

Please review the following information and complete the Client Authorization section. To comply with NELAC regulations, we must receive authorization before proceeding with sample analysis.

Thank you,

Martha Maier
mmaier@vista-analytical.com
916-673-1520

The following information or item is needed to proceed with analysis:

- [ ] Complete Chain-of-Custody
- [ ] Test Method Requested
- [ ] Analyte List Requested
- [ ] Other:
- [ ] Preservative
- [ ] Sample Identification
- [X] Sample Collection Date: See Comments
- [ ] Collector's Name
- [ ] Sample Type
- [ ] Sample Location

The following anomalies were noted. Authorization is needed to proceed with analysis.

- [ ] Temperature outside < 6°C Range — Samples Affected: _____

  Temperature _____°C Ice Present? Yes No Melted

- [ ] Sample ID Discrepancy
- [ ] Sample Holding Time Missed
- [ ] Custody Seals Broken
- [ ] Insufficient Sample Size
- [ ] Sample Container(s) Broken
- [ ] Incorrect Container Type

Comments: Sample collection dates not on chain of custody

Client Authorization

Proceed with Analysis: YES NO Signature and Date [signature] 9/28/18

Client Comments/Instructions Per Jeff Pincumbe via email, samples were collected 9/25/18.