

April 23, 2019

### Vista Work Order No. 1900675

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 April 09, 2019 under your Project Name 'MDEQ State Municipal Sampling'.

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 Analytical Laboratory certifies that the report herein meets all the requirements set forth by NELAP for those applicable test methods. Results relate only to the samples as received by the laboratory. This report should not be reproduced except in full without the written approval of Vista.

Vista Analytical Laboratory 1104 Windfield Way El Dorado Hills, CA 95762 ph; 916-673-1520 fx; 916-673-0106 www.vista-analytical.com

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### Vista Work Order No. 1900675 Case Narrative

#### **Sample Condition on Receipt:**

One drinking water sample was received in good condition and within the method temperature requirements. The sample was received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

### **Analytical Notes:**

### EPA Method 537, Rev. 1.1

The sample was extracted and analyzed for a selected list of 14 PFAS using EPA Method 537, Rev. 1.1. The results have been reported following the conventions specified by the Michigan Department of Environmental Quality.

### **Holding Times**

The sample was extracted and analyzed within the method hold times.

### **Quality Control**

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

Two Laboratory Fortified Blanks (LFB/LFBD) and a Laboratory Reagent Blank (LRB) were extracted and analyzed with the preparation batch. No analytes were detected in the Laboratory Reagent Blank. The LFB/LFBD recoveries were within the method acceptance criteria.

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

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# **Sample Inventory Report**

Vista Client
Sample ID Sample ID Sampled Received Components/Containers

1900675-01 GWEF1904011500GGA 01-Apr-19 15:00 09-Apr-19 09:50 HDPE Bottle, 250 mL
HDPE Bottle, 250 mL

Vista Project: 1900675 Client Project: MDEQ State Municipal Sampling

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## ANALYTICAL RESULTS

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Sample ID: L	RB								EPA Meth	10d 537
Client Data				Lab	oratory Data					
Name:	Merit Laboratories, Inc.	Matrix:	Aqueous	Lab	Sample:	B9D0091-	BLK1	Column:	BEH C18	
Project:	MDEQ State Municipal Sampling								2211 010	
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND		2		B9D0091	12-Apr-19	0.25 L	16-Apr-19 14:30	1
PFHxA	307-24-4	ND		2		B9D0091	12-Apr-19	0.25 L	16-Apr-19 14:30	
PFHpA	375-85-9	ND		2		B9D0091	12-Apr-19	0.25 L	16-Apr-19 14:30	1
PFHxS	355-46-4	ND		2		B9D0091	12-Apr-19	0.25 L	16-Apr-19 14:30	1
PFOA	335-67-1	ND		2		B9D0091	12-Apr-19	0.25 L	16-Apr-19 14:30	1
PFNA	375-95-1	ND		2		B9D0091	12-Apr-19	0.25 L	16-Apr-19 14:30	1
PFOS	1763-23-1	ND		2		B9D0091	12-Apr-19	0.25 L	16-Apr-19 14:30	1
PFDA	335-76-2	ND		2		B9D0091	12-Apr-19	0.25 L	16-Apr-19 14:30	1
MeFOSAA	2355-31-9	ND		4		B9D0091	12-Apr-19	0.25 L	16-Apr-19 14:30	1
EtFOSAA	2991-50-6	ND		4		B9D0091	12-Apr-19	0.25 L	16-Apr-19 14:30	1
PFUnA	2058-94-8	ND		4		B9D0091	12-Apr-19	0.25 L	16-Apr-19 14:30	1
PFDoA	307-55-1	ND		4		B9D0091	12-Apr-19	0.25 L	16-Apr-19 14:30	1
PFTrDA	72629-94-8	ND		4		B9D0091	12-Apr-19	0.25 L	16-Apr-19 14:30	1
PFTeDA	376-06-7	ND		4		B9D0091	12-Apr-19	0.25 L	16-Apr-19 14:30	
Labeled Standar	rds Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	97	70 - 130			B9D0091	12-Apr-19	0.25 L	16-Apr-19 14:30	1
13C2-PFDA	SURR	94	70 - 130			B9D0091	12-Apr-19	0.25 L	16-Apr-19 14:30	
d5-EtFOSAA	SURR	95	70 - 130			B9D0091	12-Apr-19	0.25 L	16-Apr-19 14:30	1

RL - Reporting limit

Results reported to RL.

Reporting convention specified by MI DEQ.

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

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Sample ID: LFBD EPA Method 537

Name: Merit Laboratories, Inc.

Project: MDEQ State Municipal Sampling

Matrix: Aqueous

Lab Sample: B9D0091-BS1/B9D0091-BSD1

QC Batch: B9D0091 Samp Size: 0.25/0.25 L Date Extracted: Column:

12-Apr-19 BEH C18

		LFB	LFB	LFB	LFB	LFBD	LFBD	LFBD		LFBD	%Rec	RPD	LFB	LFB	LFBD	LFBD
Analyte	CAS Number	(ng/L)	Spike Amt	% Rec	Quals	(ng/L)	Spike Amt	% Rec	RPD	Quals	Limits	Limits	Analyzed	Dil	Analyzed	Dil
PFBS	375-73-5	18	18	104		19	18	105	2		50-150	50	16-Apr-19 14:40	1	16-Apr-19 14:51	1 1
PFHxA	307-24-4	21	20	105		21	20	105	0		50-150	50	16-Apr-19 14:40	1	16-Apr-19 14:51	1 1
PFHpA	375-85-9	20	20	99		21	20	105	6		50-150	50	16-Apr-19 14:40	1	16-Apr-19 14:51	1 1
PFHxS	355-46-4	20	18	110		17	18	91	19		50-150	50	16-Apr-19 14:40	1	16-Apr-19 14:51	1 1
PFOA	335-67-1	21	20	106		21	20	106	0		50-150	50	16-Apr-19 14:40	1	16-Apr-19 14:51	1 1
PFNA	375-95-1	20	20	100		20	20	100	0		50-150	50	16-Apr-19 14:40	1	16-Apr-19 14:51	1 1
PFOS	1763-23-1	17	19	94		19	19	104	11		50-150	50	16-Apr-19 14:40	1	16-Apr-19 14:51	1 1
PFDA	335-76-2	19	20	94		19	20	94	0		50-150	50	16-Apr-19 14:40	1	16-Apr-19 14:51	1 1
MeFOSAA	2355-31-9	19	20	95		20	20	99	4		50-150	50	16-Apr-19 14:40	1	16-Apr-19 14:51	1 1
EtFOSAA	2991-50-6	20	20	99		20	20	99	0		50-150	50	16-Apr-19 14:40	1	16-Apr-19 14:51	1 1
PFUnA	2058-94-8	20	20	98		20	20	101	3		50-150	50	16-Apr-19 14:40	1	16-Apr-19 14:51	1 1
PFDoA	307-55-1	19	20	95		18	20	88	7		50-150	50	16-Apr-19 14:40	1	16-Apr-19 14:51	1 1
PFTrDA	72629-94-8	19	20	94		18	20	91	3		50-150	50	16-Apr-19 14:40	1	16-Apr-19 14:51	1 1
PFTeDA	376-06-7	19	20	94		18	20	90	4		50-150	50	16-Apr-19 14:40	1	16-Apr-19 14:51	1 1
				LFB	LFB			LFBD		LFBD			LFB	LFB	LFBD	LFBD
Labeled St	andards	Туре		% Rec	Quals			% Rec		Quals	Limits		Analyzed	Dil	Analyzed	Dil
13C2-PFHx	kΑ	SURR		95				96			70-130		16-Apr-19 14:40	1	16-Apr-19 14:51	1 1
13C2-PFD	A	SURR		88				91			70-130		16-Apr-19 14:40	1	16-Apr-19 14:51	1 1
d5-EtFOSA	A	SURR		89				95			70-130		16-Apr-19 14:40	1	16-Apr-19 14:51	1 1

Data Reported per Michigan DEQ instructions.

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Sample ID: G	GWEF1904011500GGA								EPA Meth	10d 537
Client Data				Lab	oratory Data					
Name:	Merit Laboratories, Inc.	Matrix:	Drinking Water	Lab	Sample:	1900675-0	1	Column:	BEH C18	
Project: Location:	MDEQ State Municipal Sampling EVART02190TP104	Date Collected:	01-Apr-19 15:00	Dat	e Received:	09-Apr-19	09:50			
Analyte	CAS Number	Conc. (ng/L)		RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	34		2		B9D0091	12-Apr-19	0.25 L	16-Apr-19 15:44	1
PFHxA	307-24-4	ND		2		B9D0091	12-Apr-19	0.25 L	16-Apr-19 15:44	1
PFHpA	375-85-9	ND		2		B9D0091	12-Apr-19	0.25 L	16-Apr-19 15:44	1
PFHxS	355-46-4	ND		2		B9D0091	12-Apr-19	0.25 L	16-Apr-19 15:44	1
PFOA	335-67-1	ND		2		B9D0091	12-Apr-19	0.25 L	16-Apr-19 15:44	
PFNA	375-95-1	ND		2		B9D0091	12-Apr-19	0.25 L	16-Apr-19 15:44	
PFOS	1763-23-1	ND		2		B9D0091	12-Apr-19	0.25 L	16-Apr-19 15:44	
PFDA	335-76-2	ND		2		B9D0091	12-Apr-19	0.25 L	16-Apr-19 15:44	
MeFOSAA	2355-31-9	ND		4		B9D0091	12-Apr-19	0.25 L	16-Apr-19 15:44	
EtFOSAA	2991-50-6	ND		4		B9D0091	12-Apr-19	0.25 L	16-Apr-19 15:44	1
PFUnA	2058-94-8	ND		4		B9D0091	12-Apr-19	0.25 L	16-Apr-19 15:44	1
PFDoA	307-55-1	ND		4		B9D0091	12-Apr-19	0.25 L	16-Apr-19 15:44	1
PFTrDA	72629-94-8	ND		4		B9D0091	12-Apr-19	0.25 L	16-Apr-19 15:44	1
PFTeDA	376-06-7	ND		4		B9D0091	12-Apr-19	0.25 L	16-Apr-19 15:44	1
Labeled Standar	rds Type	% Recovery	Limits		Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	95	70 - 130			B9D0091	12-Apr-19	0.25 L	16-Apr-19 15:44	1
13C2-PFDA	SURR	95	70 - 130			B9D0091	12-Apr-19	0.25 L	16-Apr-19 15:44	1
d5-EtFOSAA	SURR	96	70 - 130			B9D0091	12-Apr-19	0.25 L	16-Apr-19 15:44	1

RL - Reporting limit

Results reported to RL.

Reporting convention specified by MI DEQ..

When reported, PFHxS, PFOA, PFOS, MeFOSAA and EtFOSAA include both linear and branched isomers. Only the linear isomer is reported for all other analytes.

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### 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

P The reported concentration may include contribution from chlorinated diphenyl

ether(s).

Q The ion transition ratio is outside of the acceptance criteria.

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.

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## **Vista Analytical Laboratory Certifications**

Accrediting Authority	Certificate Number
Alaska Department of Environmental Conservation	17-013
Arkansas Department of Environmental Quality	19-013-0
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2018017
Michigan Department of Environmental Quality	9932
Minnesota Department of Health	1521520
New Hampshire Environmental Accreditation Program	207718
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
Oregon Laboratory Accreditation Program	4042-010
Pennsylvania Department of Environmental Protection	015
Texas Commission on Environmental Quality	T104704189-19-10
Virginia Department of General Services	9618
Washington Department of Ecology	C584-19
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.

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## **NELAP Accredited Test Methods**

MATRIX: Air	
<b>Description of Test</b>	Method
Determination of Polychlorinated p-Dioxins & Polychlorinated	EPA 23
Dibenzofurans	
Determination of Polychlorinated p-Dioxins & Polychlorinated	EPA TO-9A
Dibenzofurans	

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

MATRIX: Drinking Water	
Description of Test	Method
2,3,7,8-Tetrachlorodibenzo- p-dioxin (2,3,7,8-TCDD) GC/HRMS	EPA
	1613/1613B
1,4-Dioxane (1,4-Diethyleneoxide) analysis by GC/HRMS	EPA 522
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	EPA 537
Perfluorinated Alkyl Acids in Drinking Water by SPE and LC/MS/MS	ISO 25101 2009

MATRIX: Non-Potable Water	
Description of Test	Method
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope	EPA 1613B
Dilution GC/HRMS	
Brominated Diphenyl Ethers by HRGC/HRMS	EPA 1614A
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, and Tissue	EPA 1668A/C
by GC/HRMS	
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	EPA 8280A/B
Dibenzofurans by GC/HRMS	
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated	EPA
Dibenzofurans (PCDFs) by GC/HRMS	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
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	EPA
Dibenzofurans (PCDFs) by GC/HRMS	8290/8290A

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MIKE JURY

Relinquished by (printed name and signature)

Relinquished by (printed name and signature)

El Dorado Hills, CA 95762

Ph: (916) 673-1520; Fax: (916) 673-0106

Date

4/1/19

Time

1500

SHIP TO: Vista Analytical Laboratory 1104 Windfield Way

ATTN: Jennifer Miller

Sample ID

GWEF1904011500GGA

Invoice to: Name

George Austin

Project ID: MDEQ STATE MUNICIPAL SAMPLING

## **CHAIN OF CUSTODY**

Address

Time

Time

Add Analysis(es) Requested

Container(s)

2 P DW

401 KETCHUM ST, SUITE B

Sampler: GEORGE AUSTIN

PO#: 60570309

Date

Date

Method of Shipment:

Tracking No.:

Location/Sample Description

EVART02190TP104

Company

MDEQ

	For Laboratory U	RRRY-L	1	i
Υ	Work Order #:	CT DUU	Temp:	·c \ °C
	Storage ID: WR	2	Storage Secured	Yes 🗹 No 🗌
	TAT	Standard:	x 21 days	
pler: GEORGE AUSTIN	(check o	The second secon	harge may apply)	
(name)		14 day	-	
	City	State	Ph#	Fax#
ST, SUITE B	BAY CITY	MI	989-894-6255	989-891-9237
Received by (printed name and signa	ture)		Date ,	Time
Marissa Sparks	Wyparlus		04/09/19	0950
Received by (printed name and signa	ture)		Date	Time
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Special Instructions/Comments:	Send Results a	nd Acknowledgements	to the list	provi	ded	 						Name	MIKE	JURY		
oy e-mail to Vista.								DOG		ND NTATION	Cor	npany	MDE	Q	3012	
								7-27-37-22		ULTS TO:	Ad	dress	401 I	KETCHUM ST, S	UITE B	
								101 CT 107 CT 107 C				City	BAY	CITY	State: MI	Zip: 48708
											1	hone	989-	394-6255	Fax: 989-8	91-9237
						 _						Email	dorin	.bogdan@aecon	n.com	
Container Types: P= HDPE, PJ= HI	OPE Jar	Bottle Preservation	n Type: T =	= Thios	ulfate,		Matrix	Туре	: AC	= Aqueous, D	W = Drin	ing W	ater, Ef	= Effluent, PP = P	ulp/Paper, SD = Sedi	ment,
O = Other:		TZ = Trizma:					CI = C	ludas	00	0 7 14047 14		n -	11/0	erum, O = Other:		

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# Sample Log-In Checklist

	2000				Page #	_ of				
Vista Work Orde	tat_std									
Samples	Date/Time			Initials:		Location: WZ-2				
Arrival:	04/09/19	0950		lims		Shelf/Rack: Na				
	Date/Time			Initials:		Location: WR-2				
Logged In:	04/09/19 1144			IUUS		Shelf/Rack: 2-3 6-4				
Delivered By:	FedEx	UPS	On Tra	c GSO	DH	Hand Delivered		Other		
Preservation:	lce		Blue Ice				Dry Ice Non			
Temp °C: 1,2	(uncorre	ected)	_							
Temp °C:	(corrected)			ed: Y /(N)			Thermometer ID: TR-4			
				77:						

					YES	NO	NA	
Adequate Sample Volume Received?								
Holding Time Acceptable?								
Shipping Container(s) Intact?								
Shipping Custody Seals Intact?							1	
Shipping Documentation Present?					1			
Airbill Trk # 4894 6695 8434								
Sample Container Intact?								
Sample Custody Seals Intact?							1	
Chain of Custody / Sample Documentation Present?					1			
COC Anomaly/Sample Acceptance Form completed?						1	/	
If Chlorinated or Drinking Water Samples, Acceptable Preservation?								
Preservation Documented:	1	Yes	No	NA				
Shipping Container	ping Container Vista Client Retain Re						Dispose	

Comments:

ID.: LR - SLC

Rev No.: 3

Rev Date: 05 October 2018

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