



July 17, 2018

Vista Work Order No. 1801291

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 June 15, 2018. This sample set was analyzed on a standard turn-around time, 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,

A handwritten signature in black ink that reads "Martha Maier".

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 Work Order No. 1801291

Case Narrative

Sample Condition on Receipt:

Two drinking 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.

Analytical Notes:

EPA Method 537, Rev. 1.1

The samples were 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 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 Laboratory Fortified Blank (LFB) 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 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 Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1801291-01	GW1806140950EDK	14-Jun-18 09:50	15-Jun-18 10:01	HDPE Bottle, 250 mL HDPE Bottle, 250 mL
1801291-02	GW1806141005EDK	14-Jun-18 10:05	15-Jun-18 10:01	HDPE Bottle, 250 mL HDPE Bottle, 250 mL

ANALYTICAL RESULTS

Sample ID: LRB

EPA Method 537

Client Data		Laboratory Data	
Name: Merit Laboratories, Inc.	Matrix: Aqueous	Lab Sample: B8F0154-BLK1	Column: BEH C18
Project: MDEQ State Municipal Sampling			

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2		B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	1
PFHxA	307-24-4	ND	2		B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	1
PFHpA	375-85-9	ND	2		B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	1
PFHxS	355-46-4	ND	2		B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	1
PFOA	335-67-1	ND	2		B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	1
PFNA	375-95-1	ND	2		B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	1
PFOS	1763-23-1	ND	2		B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	1
PFDA	335-76-2	ND	2		B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	1
MeFOSAA	2355-31-9	ND	4		B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	1
EtFOSAA	2991-50-6	ND	4		B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	1
PFUnA	2058-94-8	ND	4		B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	1
PFDoA	307-55-1	ND	4		B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	1
PFTeDA	72629-94-8	ND	4		B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	1
PFTeDA	376-06-7	ND	4		B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	1
Labeled Standards									
	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	102	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	1
13C2-PFDA	SURR	95	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	1
d5-EtFOSAA	SURR	96	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 20:14	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.

Sample ID: LFB

EPA Method 537

Client Data		Matrix:		Laboratory Data							
Name:	Merit Laboratories, Inc.	Aqueous		Lab Sample:	B8F0154-BS1	Column:	BEH C18				
Project:	MDDEQ State Municipal Sampling										
Analyte	CAS Number	Amt Found (ng/L)	Spike Amt	% Rec	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	35	35	99	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	1
PFHxA	307-24-4	38	40	96	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	1
PFHpA	375-85-9	38	40	95	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	1
PFHxS	355-46-4	36	36	98	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	1
PFOA	335-67-1	38	40	95	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	1
PFNA	375-95-1	36	40	90	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	1
PFOS	1763-23-1	29	37	78	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	1
PFDA	335-76-2	44	40	110	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	1
MeFOSAA	2355-31-9	40	40	99	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	1
EFOSAAA	2991-50-6	38	40	95	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	1
PFUnA	2058-94-8	39	40	97	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	1
PFDoA	307-55-1	36	40	89	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	1
PFTriDA	72629-94-8	36	40	89	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	1
PFTeDA	376-06-7	36	40	91	70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	1
Labeled Standards		Type	% Rec		Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA		SURR	98		70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	1
13C2-PFDA		SURR	101		70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	1
d5-EFOSAA		SURR	97		70 - 130		B8F0154	26-Jun-18	0.25 L	06-Jul-18 19:37	1

Data Reported per Michigan DEQ instructions.

Sample ID: GW1806140950EDK

Client Data			Matrix: Drinking Water			Laboratory Data		
Name:	Merit Laboratories, Inc.	Matrix:	Drinking Water	Lab Sample:	1801291-01	Column:	BEH C18	
Project:	MDEQ State Municipal Sampling	Date Collected:	14-Jun-18 09:50	Date Received:	15-Jun-18 10:01			
Location:	SBL00MHIGH06080TP100							

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2		B8F0154	26-Jun-18	0.26 L	06-Jul-18 21:58	1
PFHxA	307-24-4	ND	2		B8F0154	26-Jun-18	0.26 L	06-Jul-18 21:58	1
PFHpA	375-85-9	ND	2		B8F0154	26-Jun-18	0.26 L	06-Jul-18 21:58	1
PFHxS	355-46-4	ND	2		B8F0154	26-Jun-18	0.26 L	06-Jul-18 21:58	1
PFOA	335-67-1	ND	2		B8F0154	26-Jun-18	0.26 L	06-Jul-18 21:58	1
PFNA	375-95-1	ND	2		B8F0154	26-Jun-18	0.26 L	06-Jul-18 21:58	1
PFOs	1763-23-1	ND	2		B8F0154	26-Jun-18	0.26 L	06-Jul-18 21:58	1
PFDA	335-76-2	ND	4		B8F0154	26-Jun-18	0.26 L	06-Jul-18 21:58	1
MeFOSAA	2355-31-9	ND	4		B8F0154	26-Jun-18	0.26 L	06-Jul-18 21:58	1
EtFOSAA	2991-50-6	ND	4		B8F0154	26-Jun-18	0.26 L	06-Jul-18 21:58	1
PFUnA	2058-94-8	ND	4		B8F0154	26-Jun-18	0.26 L	06-Jul-18 21:58	1
PFDoA	307-55-1	ND	4		B8F0154	26-Jun-18	0.26 L	06-Jul-18 21:58	1
PFTpDA	72629-94-8	ND	4		B8F0154	26-Jun-18	0.26 L	06-Jul-18 21:58	1
PFTeDA	376-06-7	ND	4		B8F0154	26-Jun-18	0.26 L	06-Jul-18 21:58	1
Labeled Standards									
	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	96	70 - 130		B8F0154	26-Jun-18	0.26 L	06-Jul-18 21:58	1
13C2-PFDA	SURR	96	70 - 130		B8F0154	26-Jun-18	0.26 L	06-Jul-18 21:58	1
d5-EtFOSAA	SURR	79	70 - 130		B8F0154	26-Jun-18	0.26 L	06-Jul-18 21:58	1

RL - Reporting limit
 Results reported to RL.
 Reporting convention specified by M1 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.

Sample ID: GW1806141005EDK

EPA Method 537

Client Data			Laboratory Data		
Name:	Merit Laboratories, Inc.	Matrix:	Drinking Water	Lab Sample:	1801291-02
Project:	MDEQ State Municipal Sampling	Date Collected:	14-Jun-18 10:05	Date Received:	15-Jun-18 10:01
Location:	SBL00MHIGH06080TP101			Column:	BEH C18

Analyte	CAS Number	Conc. (ng/L)	RL	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
PFBS	375-73-5	ND	2		B8F0154	26-Jun-18	0.26 L	06-Jul-18 22:07	1
PFHxA	307-24-4	ND	2		B8F0154	26-Jun-18	0.26 L	06-Jul-18 22:07	1
PFHpA	375-85-9	ND	2		B8F0154	26-Jun-18	0.26 L	06-Jul-18 22:07	1
PFHxS	355-46-4	ND	2		B8F0154	26-Jun-18	0.26 L	06-Jul-18 22:07	1
PFOA	335-67-1	ND	2		B8F0154	26-Jun-18	0.26 L	06-Jul-18 22:07	1
PFNA	375-95-1	ND	2		B8F0154	26-Jun-18	0.26 L	06-Jul-18 22:07	1
PFOS	1763-23-1	ND	2		B8F0154	26-Jun-18	0.26 L	06-Jul-18 22:07	1
PFDA	335-76-2	ND	2		B8F0154	26-Jun-18	0.26 L	06-Jul-18 22:07	1
MeFOSAA	2355-31-9	ND	4		B8F0154	26-Jun-18	0.26 L	06-Jul-18 22:07	1
EtFOSAA	2991-50-6	ND	4		B8F0154	26-Jun-18	0.26 L	06-Jul-18 22:07	1
PFUnA	2058-94-8	ND	4		B8F0154	26-Jun-18	0.26 L	06-Jul-18 22:07	1
PFDoA	307-55-1	ND	4		B8F0154	26-Jun-18	0.26 L	06-Jul-18 22:07	1
PFTDA	72629-94-8	ND	4		B8F0154	26-Jun-18	0.26 L	06-Jul-18 22:07	1
PFTeDA	376-06-7	ND	4		B8F0154	26-Jun-18	0.26 L	06-Jul-18 22:07	1
Labeled Standards									
	Type	% Recovery	Limits	Qualifiers	Batch	Extracted	Samp Size	Analyzed	Dilution
13C2-PFHxA	SURR	101	70 - 130		B8F0154	26-Jun-18	0.26 L	06-Jul-18 22:07	1
13C2-PFDA	SURR	98	70 - 130		B8F0154	26-Jun-18	0.26 L	06-Jul-18 22:07	1
d5-EtFOSAA	SURR	85	70 - 130		B8F0154	26-Jun-18	0.26 L	06-Jul-18 22:07	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.

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	17-015-0
	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	2016026
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	4042-008
Pennsylvania Department of Environmental Protection	014
Texas Commission on Environmental Quality	T104704189-17-8
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.



CHAIN OF CUSTODY

For Laboratory Use Only

Work Order #: 1801291 Temp: 4.5 °C

Storage ID: WP-2 Storage Secured: Yes No

Project ID: MDEQ STATE MUNICIPAL SAMPLING PO#: 60570309 Sampler: EMILY KEENAN (name)

Invoice to: Name MIKE JURY Company MDEQ Address 401 KETCHUM ST, SUITE B City BAV CITY State MI Ph# 989-894-6255 Fax# 989-891-9237

Relinquished by (printed name and signature) EMILY KEENAN Date 6/14/18 Time 1700 Received by (printed name and signature) Sydney Bonstein Date 6/15/18 Time 1118

Relinquished by (printed name and signature) _____ Date _____ Time _____ Received by (printed name and signature) _____ Date _____ Time _____

SHIP TO: Vista Analytical Laboratory
 1104 Windfield Way
 El Dorado Hills, CA 95762
 Ph: (916) 673-1520; Fax: (916) 673-0106

Method of Shipment: _____
 Tracking No.: _____

ATTN: Jennifer Miller

Sample ID	Date	Time	Location/Sample Description	Add Analyte(s) Requested		PFAS Isotope Dilution					USEPA Method 537		Comments		
				Quantity	Type	Matrix	List of 21	List of 21 w/Isomers	List of 24	List of 24 w/Isomers	List of 28	Other: Please List Below		PFOA/ PFOS	UCMR3 PFAS List: 6
GW1806140950EDK ✓	6/14/18	0950	SBLDOMHIGH08080TP100	2	P	DW							X	TZ	
GW1806141005EDK	6/14/18	1005	SBLDOMHIGH08080TP101	2	P	DW							X	TZ	

Special Instructions/Comments: _____
 Send Results and Acknowledgements to the list provided
 by e-mail to Vista.

Name: MIKE JURY
 Company: MDEQ
 Address: 401 KETCHUM ST, SUITE B
 City: BAV CITY State: MI Zip: 48708
 Phone: 989-894-6255 Fax: 989-891-9237
 Email: dorin.bogdan@acem.com

Container Types: P = HDPE, PL = HDPE Jar
 Bottle Preservation Type: T = Thiosulfate,
 O = Other: _____ TZ = Trizma: _____

Matrix Types: AQ = Aqueous, DW = Drinking Water, EF = Effluent, PP = Pulp/Paper, SD = Sediment,
 SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum, O = Other: _____

Sample Log-in Checklist

 Vista Work Order #: 1801291 TAT SLR

Samples Arrival:	Date/Time 06/15/18 1001 <i>BLB/06/14/18</i>	Initials: SR	Location: WR-2 Shelf/Rack: N/A				
Logged In:	Date/Time 6/17/18 0837	Initials: BLB	Location: WR-2 Shelf/Rack: SR EBA				
Delivered By:	<input checked="" type="checkbox"/> FedEx	<input type="checkbox"/> UPS	<input type="checkbox"/> On Trac	<input type="checkbox"/> GSO	<input type="checkbox"/> DHL	<input type="checkbox"/> Hand Delivered	<input type="checkbox"/> Other
Preservation:	<input checked="" type="checkbox"/> Ice	<input type="checkbox"/> Blue Ice	<input type="checkbox"/> Dry Ice	<input type="checkbox"/> None			
Temp °C: 4.6 (uncorrected)	Time: 1112	Thermometer ID: IR-4					
Temp °C: 4.5 (corrected)	Probe used: Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>						

		YES	NO	NA
Adequate Sample Volume Received?		<i>BLB</i>		
Holding Time Acceptable?		<i>SR</i>		
Shipping Container(s) Intact?		<i>SR</i>		
Shipping Custody Seals Intact?		<i>6/15/18</i> <i>SR</i>		<i>SR</i>
Shipping Documentation Present?		<i>SR</i>		
Airbill	Trk # <i>7724 8048 6150</i>	<i>SR</i>		
Sample Container Intact?		<i>BLB</i>		
Sample Custody Seals Intact?				<i>BLB</i>
Chain of Custody / Sample Documentation Present?		<i>SR</i>		
COC Anomaly/Sample Acceptance Form completed?			<i>WWS</i>	<i>WWS</i>
If Chlorinated or Drinking Water Samples, Acceptable Preservation?		<i>BLB</i>		
Preservation Documented:	Na ₂ S ₂ O ₃ <input type="checkbox"/> <i>Trizma</i> <input checked="" type="checkbox"/> None <input type="checkbox"/>	<input checked="" type="checkbox"/> Yes	No	NA
Shipping Container	<i>Vista</i> <input checked="" type="checkbox"/> Client <input type="checkbox"/> <i>Retain</i> <input checked="" type="checkbox"/>	Return	Dispose	

Comments: