Analytical Laboratory Report

Report ID: S24877.01(01)
Generated on 06/24/2021

Report to

Attention: Erin Sprenkle
Village of L'anse WWTP
411 N. Fourth Street
L'anse MI 49946

Phone: 906-524-7293 FAX:
Email: elahti@lansemi.org

Report produced by

Merit Laboratories, Inc.
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East Lansing, MI 48823

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John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S24877.01-S24877.02
Project: Monitoring
Collected Date(s): 06/02/2021
Submitted Date/Time: 06/03/2021 13:00
Sampled by: Erin Sprenkle
P.O. #:

Table of Contents

Maya Murshak
Technical Director

Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.
Methods may be modified for improved performance.
Results reported on a dry weight basis where applicable.
'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).
40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.
QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.
Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.
Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)
PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."
Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched

Method Summary

Method	Version
ASTM D7968-17M	ASTM Method D7968 - 17 Modified (Isotopic Dilution)
ASTMD7979-19M	ASTM Method D7979 - 19 Modified (Isotopic Dilution)
SM2540B	Standard Method 2540 B 2011

Parameter Summary

Parameter	Synonym	Cas #
PFBA	Perfluorobutanoic Acid	375-22-4
PFPeA	Perfluoropentanoic Acid	2706-90-3
4:2 FTSA	4:2 Fluorotelomer Sulfonic Acid	757124-72-4
PFHxA	Perfluorohexanoic Acid	307-24-4
PFBS	Perfluorobutane sulfonic Acid	375-73-5
PFHpA	Perfluoroheptanoic Acid	375-85-9
PFPeS	Perfluoropentane Sulfonic Acid	2706-91-4
6:2 FTSA	6:2 Fluorotelomer Sulfonic Acid	27619-97-2
PFOA	Perfluorooctanoic Acid	335-67-1
PFHxS	Perfluorohexane Sulfonic Acid	355-46-4
PFHxS-LN	Perfluorohexane Sulfonic Acid - LN	355-46-4-LN
PFHxS-BR	Perfluorohexane Sulfonic Acid - BR	355-46-4-BR
PFNA	Perfluorononanoic Acid	375-95-1
8:2 FTSA	8:2 Fluorotelomer Sulfonic Acid	39108-34-4
PFHpS	Perfluoroheptane Sulfonic Acid	375-92-8
PFDA	Perfluorodecanoic Acid	335-76-2
N-MeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid	2355-31-9
EtFOSAA	N-Ethyl Perfluorooctane Sulfonamidoacetic Acid	2991-50-6
PFOS	Perfluorooctane Sulfonic Acid	1763-23-1
PFOS-LN	Perfluorooctane Sulfonic Acid - LN	1763-23-1-LN
PFOS-BR	Perfluorooctane Sulfonic Acid - BR	1763-23-1-BR
PFUnDA	Perfluoroundecanoic Acid	2058-94-8
PFNS	Perfluorononane Sulfonic Acid	68259-12-1
PFDoDA	Perfluorododecanoic Acid	307-55-1
PFDS	Perfluorodecane Sulfonic Acid	335-77-3
PFTrDA	Perfluorotridecanoic Acid	72629-94-8
FOSA	Perfluorooctane Sulfonamide	754-91-6
PFTeDA	Perfluorotetradecanoic Acid	376-06-7
11Cl-PF3OUdS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	763051-92-9
9Cl-PF3ONS	9-chlorohexadecafluoro-3-oxanone1-sulfonic acid	756426-58-1
ADONA	4,8-dioxa-3H-perfluorononanoic acid	919005-14-4
HFPO-DA	Hexafluoropropylene oxide dimer	13252-13-6

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Analytical Laboratory Report

Sample Summary (2 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S24877.01	Biosolids	Sludge	06/02/21 13:00
S24877.02	Field Blank	Water	06/02/21 13:00

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Analytical Laboratory Report

Lab Sample ID: S24877.01
Sample Tag: Biosolids
Collected Date/Time: 06/02/2021 13:00
Matrix: Sludge
COC Reference: 136958

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	5.9	IR
1	250ml Plastic	None	Yes	5.9	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	17.60/6.88/10	ASTM D7968-17M	06/07/21 12:00	KCV	

Inorganics

Method: SM2540B, Run Date: 06/04/21 17:40, Analyst: ELR

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Solids*	4.2	1		%	1		

Organics

28 PFAs, Method: ASTM D7968-17M, Run Date: 06/09/21 08:29, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	0.44		ug/kg	22.2	375-22-4	I
PFPeA*	0.36	0.22		ug/kg	22.2	2706-90-3	
4:2 FTSA*	Not detected	0.22		ug/kg	22.2	757124-72-4	I
PFHxA*	0.84	0.22		ug/kg	22.2	307-24-4	I
PFBS*	Not detected	0.22		ug/kg	22.2	375-73-5	
PFHpA*	Not detected	0.22		ug/kg	22.2	375-85-9	I
PFPeS*	Not detected	0.22		ug/kg	22.2	2706-91-4	
6:2 FTSA*	Not detected	0.22		ug/kg	22.2	27619-97-2	
PFOA*	0.37	0.22		ug/kg	22.2	335-67-1	I
PFHxS*	Not detected	0.22		ug/kg	22.2	355-46-4	
PFHxS-LN*	Not detected	0.22		ug/kg	22.2	355-46-4-LN	
PFHxS-BR*	Not detected	0.22		ug/kg	22.2	355-46-4-BR	
PFNA*	0.29	0.22		ug/kg	22.2	375-95-1	
8:2 FTSA*	0.24	0.22		ug/kg	22.2	39108-34-4	
PFHpS*	Not detected	0.22		ug/kg	22.2	375-92-8	
PFDA*	0.87	0.22		ug/kg	22.2	335-76-2	I
N-MeFOSAA*	17	0.22		ug/kg	22.2	2355-31-9	I
EtFOSAA*	5.9	0.22		ug/kg	22.2	2991-50-6	I
PFOS*	4.8	0.22		ug/kg	22.2	1763-23-1	I
PFOS-LN*	3.7	0.22		ug/kg	22.2	1763-23-1-LN	I
PFOS-BR*	0.86	0.22		ug/kg	22.2	1763-23-1-BR	I
PFUnDA*	0.68	0.22		ug/kg	22.2	2058-94-8	I1
PFNS*	Not detected	0.22		ug/kg	22.2	68259-12-1	I
PFDoDA*	1.4	0.22		ug/kg	22.2	307-55-1	I1
PFDS*	Not detected	0.22		ug/kg	22.2	335-77-3	I
PFTrDA*	Not detected	0.22		ug/kg	22.2	72629-94-8	I1
FOSA*	1.2	0.22		ug/kg	22.2	754-91-6	
PFTeDA*	Not detected	0.22		ug/kg	22.2	376-06-7	I1
11Cl-PF3OUdS*	Not detected	0.22		ug/kg	22.2	763051-92-9	I

I-Matrix interference with internal standard
1-IS recovery <10%

Lab Sample ID: S24877.01 (continued)
Sample Tag: Biosolids

28 PFAs, Method: ASTM D7968-17M, Run Date: 06/09/21 08:29, Analyst: KCV (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
9Cl-PF3ONS*	Not detected	0.22		ug/kg	22.2	756426-58-1	I
ADONA*	Not detected	0.22		ug/kg	22.2	919005-14-4	I
HFPO-DA*	Not detected	0.22		ug/kg	22.2	13252-13-6	

I-Matrix interference with internal standard

Analytical Laboratory Report

Lab Sample ID: S24877.02
Sample Tag: Field Blank
Collected Date/Time: 06/02/2021 13:00
Matrix: Water
COC Reference: 136958

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	5.9	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.37/6.86/11	ASTMD7979-19M	06/04/21 17:00	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 06/04/21 23:48, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	0.01		ug/L	2	375-22-4	
PFPeA*	Not detected	0.0040		ug/L	2	2706-90-3	
4:2 FTSA*	Not detected	0.0020		ug/L	2	757124-72-4	
PFHxA*	Not detected	0.0020		ug/L	2	307-24-4	
PFBS*	Not detected	0.0020		ug/L	2	375-73-5	
PFHpA*	Not detected	0.0020		ug/L	2	375-85-9	
PFPeS*	Not detected	0.0020		ug/L	2	2706-91-4	
6:2 FTSA*	Not detected	0.0040		ug/L	2	27619-97-2	
PFOA*	Not detected	0.0020		ug/L	2	335-67-1	
PFHxS*	Not detected	0.0020		ug/L	2	355-46-4	
PFHxS-LN*	Not detected	0.0020		ug/L	2	355-46-4-LN	
PFHxS-BR*	Not detected	0.0020		ug/L	2	355-46-4-BR	
PFNA*	Not detected	0.0020		ug/L	2	375-95-1	
8:2 FTSA*	Not detected	0.0020		ug/L	2	39108-34-4	
PFHpS*	Not detected	0.0020		ug/L	2	375-92-8	
PFDA*	Not detected	0.0020		ug/L	2	335-76-2	
N-MeFOSAA*	Not detected	0.0020		ug/L	2	2355-31-9	
EtFOSAA*	Not detected	0.0040		ug/L	2	2991-50-6	
PFOS*	Not detected	0.0020		ug/L	2	1763-23-1	
PFOS-LN*	Not detected	0.0020		ug/L	2	1763-23-1-LN	
PFOS-BR*	Not detected	0.0020		ug/L	2	1763-23-1-BR	
PFUnDA*	Not detected	0.0020		ug/L	2	2058-94-8	
PFNS*	Not detected	0.0020		ug/L	2	68259-12-1	
PFDoDA*	Not detected	0.0020		ug/L	2	307-55-1	
PFDS*	Not detected	0.0020		ug/L	2	335-77-3	
PFTrDA*	Not detected	0.0020		ug/L	2	72629-94-8	
FOSA*	Not detected	0.0020		ug/L	2	754-91-6	
PFTeDA*	Not detected	0.0040		ug/L	2	376-06-7	
11Cl-PF3OUdS*	Not detected	0.0020		ug/L	2	763051-92-9	
9Cl-PF3ONS*	Not detected	0.0020		ug/L	2	756426-58-1	
ADONA*	Not detected	0.0020		ug/L	2	919005-14-4	
HFPO-DA*	Not detected	0.01		ug/L	2	13252-13-6	

Merit Laboratories Login Checklist

Lab Set ID: S24877
Client: MISCPFC (Village of L'anse WWTP)
Project: Monitoring
Submitted: 06/03/2021 13:00 Login User: REJ

Attention: Erin Sprenkle
Address: Village of L'anse WWTP
411 N. Fourth Street
L'anse MI 49946

Phone: 906-524-7293 FAX:
Email: elahti@lansemi.org

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 5.9
02.	[X] Yes	[ ] No	[ ] N/A	Received on ice/ cooling process begun	
03.	[ ] Yes	[X] No	[ ] N/A	Samples shipped	
04.	[ ] Yes	[X] No	[ ] N/A	Samples left in 24 hr. drop box	
05.	[ ] Yes	[ ] No	[X] N/A	Are there custody seals/tape or is the drop box locked	
Chain of Custody					
06.	[X] Yes	[ ] No	[ ] N/A	COC adequately filled out	
07.	[X] Yes	[ ] No	[ ] N/A	COC signed and relinquished to the lab	
08.	[X] Yes	[ ] No	[ ] N/A	Sample tag on bottles match COC	
09.	[ ] Yes	[X] No	[ ] N/A	Subcontracting needed? Subcontacted to:	
Preservation					
10.	[X] Yes	[ ] No	[ ] N/A	Do sample have correct chemical preservation	
11.	[ ] Yes	[ ] No	[X] N/A	Completed pH checks on preserved samples? (no VOAs)	
12.	[ ] Yes	[X] No	[ ] N/A	Did any samples need to be preserved in the lab?	
Bottle Conditions					
13.	[X] Yes	[ ] No	[ ] N/A	All bottles intact	
14.	[X] Yes	[ ] No	[ ] N/A	Appropriate analytical bottles are used	
15.	[X] Yes	[ ] No	[ ] N/A	Merit bottles used	
16.	[X] Yes	[ ] No	[ ] N/A	Sufficient sample volume received	
17.	[ ] Yes	[X] No	[ ] N/A	Samples require laboratory filtration	
18.	[X] Yes	[ ] No	[ ] N/A	Samples submitted within holding time	
19.	[ ] Yes	[ ] No	[X] N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: _____ Date: _____

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Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # _____ OF _____ 136958

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: ERIN SPRENKLE (LAHTI)
COMPANY: Village of L'Anse WWTP
ADDRESS: 411 N. Fourth Street
CITY: L'Anse STATE: MI ZIP CODE: 49946
PHONE NO.: 906 524-7293 FAX NO.: P.O. NO.:
E-MAIL ADDRESS: elahti@lansemi.org QUOTE NO.:

INVOICE TO

☐ SAME
CONTACT NAME: Village of L'Anse
COMPANY: ROBERT LAFAVE
ADDRESS: 101 N. Main Street
CITY: L'Anse STATE: MI ZIP CODE: 49946
PHONE NO.: 906 524-6116 E-MAIL ADDRESS:

PROJECT NO./NAME:
SAMPLER(S) - PLEASE PRINT/SIGN NAME: ERIN SPRENKLE / ESprenkle

TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☑ STANDARD ☐ OTHER _____

DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER _____

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

MERIT LAB NO. FOR LAB USE ONLY	YEAR DATE	YEAR TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER
24877.01	6/2/21	1:00PM	Centrifuge #1 Biosolids	SL								
	6/2/21	1:00PM	Centrifuge #2 Biosolids	SL								
	6/2/21	1:00PM	Centrifuge #3 Biosolids	SL								
	6/2/21	1:00PM	250 ml Bottle Biosolids	SL								
24877.02	6/2/21	1:00PM	Field Blank									

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

* Please see attached sheet for PFAS testing
* Also please report in dry weight

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES
Project Locations
☐ Detroit ☐ New York
☐ Other _____
Special Instructions

RELINQUISHED BY: SIGNATURE/ORGANIZATION	ESprenkle / Lead operator Lansewwtp ☑ Sampler	DATE 6/2/21	TIME 1:20PM	
RECEIVED BY: SIGNATURE/ORGANIZATION	UPS	DATE	TIME	
RELINQUISHED BY: SIGNATURE/ORGANIZATION	UPS	DATE 6/3/21	TIME 1300	
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE 6/3/21	TIME 1300	

RELINQUISHED BY: SIGNATURE/ORGANIZATION		DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION		DATE	TIME

SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS

NOTES: TEMP. ON ARRIVAL 5.9

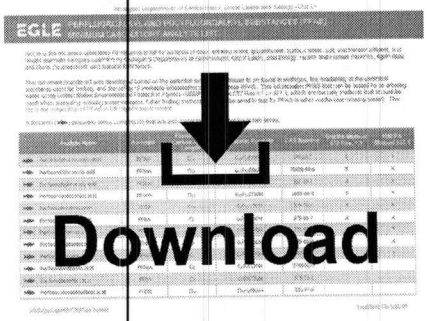
PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Rev. 5.18.12

Department of Environment, Great Lakes, and Energy

Michigan PFAS Action Response Team

PFAS Minimum Laboratory Analyte List



Below is the minimum laboratory PFAS analyte list for analysis of deer, drinking water, groundwater, surface water, soil, wastewater effluent, and landfill leachate samples collected by Michigan's Departments of Environment, Great Lakes, and Energy, Health and Human Services, Agriculture and Rural Development, and Natural Resources.

This minimum analyte list was developed based on the potential for these chemicals to be found in Michigan, the availability of the chemical standards used for testing, and the ability of available laboratories to test for these PFAS. This list includes PFAS that can be tested for in drinking water using United States Environmental Protection Agency (USEPA) Methods 537 Rev.1.1 or 537.1, which are the only methods that should be used when analyzing drinking water samples. Other testing methodology may be used to test for PFAS in other media (not drinking water). This list is not exhaustive of PFAS in Michigan's environment.

A fish icon (🐟) precedes those compounds that are also currently being tested for in fish tissue.

Revised October 1, 2019

PFAS MINIMUM ANALYTE LIST

FISH TISSUE	ANALYTE NAME	ACRONYM	FLUORINATED CARBON CHAIN LENGTH	MOLECULAR FORMULA	CAS NUMBER	USEPA METHOD 537 REV. 1.1	USEPA METHOD 537.1
🐟	Perfluorotetradecanoic acid	PFTeA	C_{14}	$C_{13}F_{27}COOH$	376-06-7	X	X
🐟	Perfluorotridecanoic acid	PFTriA	C_{13}	$C_{12}F_{25}COOH$	72629-94-8	X	X
🐟	Perfluorododecanoic acid	PFDoA	C_{12}	$C_{11}F_{23}COOH$	307-55-1	X	X
🐟	Perfluoroundecanoic acid	PFUnA	C_{11}	$C_{10}F_{21}COOH$	2058-94-8	X	X
🐟	Perfluorodecanoic acid	PFDA	C_{10}	$C_9F_{19}COOH$	335-76-2	X	X
🐟	Perfluorononanoic acid	PFNA	C_9	$C_8F_{17}COOH$	375-95-1	X	X
🐟	Perfluorooctanoic acid	PFOA	C_8	$C_7F_{15}COOH$	335-67-1	X	X
🐟	Perfluoroheptanoic acid	PFHpA	C_7	$C_6F_{13}COOH$	375-85-9	X	X
🐟	Perfluorohexanoic acid	PFHxA	C_6	$C_5F_{11}COOH$	307-24-4	X	X

FISH TISSUE	ANALYTE NAME	ACRONYM	FLUORINATED CARBON CHAIN LENGTH	MOLECULAR FORMULA	CAS NUMBER	USEPA METHOD 537 REV. 1.1	USEPA METHOD 537.1
🐟	Perfluoropentanoic acid	PFPeA	C_5	C_4F_9COOH	2706-90-3		
🐟	Perfluorobutanoic acid	PFBA	C_4	C_3F_7COOH	375-22-4		
🐟	Perfluorodecanesulfonic acid	PFDS	C_{10}	$C_{10}F_{21}SO_3H$	335-77-3		
	Perfluorononanesulfonic acid	PFNS	C_9	$C_9F_{19}SO_3H$	68259-12-1		
🐟	Perfluorooctanesulfonic acid	PFOS	C_8	$C_8F_{17}SO_3H$	1763-23-1	X	X
	Perfluoroheptanesulfonic acid	PFHpS	C_7	$C_7F_{15}SO_3H$	375-92-8		
🐟	Perfluorohexanesulfonic acid	PFHxS	C_6	$C_6F_{13}SO_3H$	355-46-4	X	X
	Perfluoropentanesulfonic acid	PFPeS	C_5	$C_5F_{11}SO_3H$	2706-91-4		
🐟	Perfluorobutanesulfonic acid	PFBS	C_4	$C_4F_9SO_3H$	375-73-5	X	X
🐟	Perfluorooctanesulfonamide	PFOSA	C_8	$C_8F_{17}SO_2NH_2$	754-91-6		
	Fluorotelomer sulphonic acid 8:2	FtS 8:2	C_8	$C_8F_{17}CH_2CH_2SO_3$	39108-34-4		
	Fluorotelomer sulphonic acid 6:2	FtS 6:2	C_6	$C_6F_{13}CH_2CH_2SO_3$	27619-97-2		
🔍	Fluorotelomer sulphonic acid 4:2	FtS 4:2	C_4	$C_4F_9CH_2CH_2SO_3$	757124-72-4		✖
	2-(N-Ethylperfluorooctanesulfonamido) acetic acid	N-EtFOSAA	C_8	$C_8F_{17}SO_2N(C_2H_5)CH_2COOH$	2991-50-6	X	X
	2-(N-Methylperfluorooctanesulfonamido) acetic acid	N-MeFOSAA	C_8	$C_8F_{17}SO_2N(CH_3)CHCOOH$	2355-31-9	X	X
	Hexafluoropropylene oxide dimer acid	HFPO-DA	C_6	$C_6HF_{11}O_3$	13252-13-6		X
	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	C_{10}	$C_{10}HF_{20}ClSO_4$	763051-92-9		X

FISH TISSUE	ANALYTE NAME	ACRONYM	FLUORINATED CARBON CHAIN LENGTH	MOLECULAR FORMULA	CAS NUMBER	USEPA METHOD 537 REV. 1.1	USEPA METHOD 537.1
	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	9Cl-PF3ONS	C_8	$C_8HF_{16}ClSO_4$	756426-58-1		X
	4,8-dioxa-3H-perfluorononanoic acid	ADONA	C_7	$C_7H_2F_{12}O_4$	919005-14-4		X

Biosolids Sampling, Analysis, Frequency, Notification, and Evaluation Requirements

Sampling: Preapplication sampling of biosolids by WWTPs is key to evaluating land application issues related to PFAS. Importantly, it will help assure industrially impacted biosolids are not land-applied. One representative biosolids sample shall be collected prior to land application. Biosolids and sludge PFAS sampling guidance is available at Michigan.gov/PFASResponse; click on the "Testing" drop-down menu, select "PFAS Sampling Guidance," and scroll down to select "Biosolids and Sludge Nov 2019."

Analysis: Currently, there are no U.S. Environmental Protection Agency (U.S. EPA)-approved methods for PFAS analysis of sludge and biosolids. The WRD recommends that WWTPs use an isotope dilution method for PFAS analysis of biosolids. PFAS results shall include all analytes (currently 28) on the MPART PFAS Minimum Laboratory Analyte List, which may be found at Michigan.gov/PFASResponse; click on the "Testing" drop-down menu, and then select "PFAS Minimum Laboratory Analyte List." Be sure to choose a laboratory experienced in PFAS biosolids analysis that has a usual reporting level of 2 micrograms per kilogram (µg/kg) for PFAS. Also note that PFAS analyses typically have a long turnaround time, up to four weeks, depending on the laboratory chosen.

All biosolids and sludge samples, including those with low solids content, should be analyzed as solids and reported on a dry weight basis. This dry weight basis reporting requirement should be specified on the chain-of-custody sent to the laboratory. During laboratory analysis, biosolids and sludge samples with a high aqueous content should be centrifuged and only the solids portion of the sample analyzed. If density differences preclude centrifugation to separate representative solids, a representative well-mixed subsample may be mixed with a drying agent and treated like a soil by the laboratory.

Sampling Frequency and Notification:

- **All U.S. EPA majors and all WWTPs with required IPPs** that intend to land-apply biosolids in Michigan shall, prior to land application, collect and analyze a minimum of one representative biosolids sample for PFAS in each year they intend to land-apply. All results of PFAS biosolids analysis and associated laboratory reports shall be submitted a minimum of two weeks prior to initial land application each year via the MiWaters schedule, *Biosolids PFAS Monitoring Report,* or as otherwise required by WRD staff.

- **All other WWTPs** that intend to land-apply biosolids in Michigan shall collect a minimum of one representative biosolids sample analyzed for PFAS prior to their initial land application. Thereafter, upon permit reissuance, WWTPs shall collect one representative biosolids sample analyzed for PFAS prior to the initial land application that occurs within the permit cycle (for a minimum of one sample every five years if land application occurs). One-time RMP approvals, such as land application of biosolids removed from wastewater stabilization lagoons, shall