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ANALYTICAL REPORT

Eurofins TestAmerica, Michigan
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Laboratory Job ID: 190-25707-1
Client Project/Site: SLUDGE PFAS

For:
City of Marysville WWTP
1535 River Rd.
PO BOX 389
Marysville, Michigan 48040

Attn: Jim Mieksztyn

Sue Schafer

Authorized for release by:
4/27/2021 6:44:09 PM

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Table of Contents

Cover Page 1
Table of Contents 2
Sample Summary 3
Case Narrative 4
Client Sample Results 5
QC Sample Results 7
Isotope Dilution Summary 10
Method Summary 11
Lab Chronicle 12
Definitions/Glossary 13
Chain of Custody 14

Sample Summary

Client: City of Marysville WWTP
Project/Site: SLUDGE PFAS

Job ID: 190-25707-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received	Asset ID
190-25707-1	PFAS - SLUDGE	Solid	04/14/21 12:30	04/16/21 08:00	

Case Narrative

Client: City of Marysville WWTP
Project/Site: SLUDGE PFAS

Job ID: 190-25707-1

Job ID: 190-25707-1

Laboratory: Eurofins TestAmerica, Michigan

Narrative

Job Narrative
190-25707-1

Comments
No additional comments.

Receipt
The sample was received on 4/16/2021 8:00 AM. Unless otherwise noted below, the sample arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 0.6º C.

LCMS
Method 537 (modified): The laboratory control sample (LCS) for preparation batch 320-481096 and analytical batch 320-482389 recovered outside control limits for Perfluoropentanesulfonic acid (PFPeS). This analyte was biased high in the LCS and was not detected in the associated samples; therefore, the data have been reported.

Method 537 (modified): The "I" qualifier means the transition mass ratio for the indicated analyte was outside of the established ratio limits. The qualitative identification of the analyte has some degree of uncertainty, and the reported value may have some high bias. However, analyst judgment was used to positively identify the analyte. PFAS - SLUDGE (190-25707-1) and (480-183362-H-3-B MS)

Method 537 (modified): Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for M2-6:2 FTS and M2-8:2 FTS in the following samples: PFAS - SLUDGE (190-25707-1). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Method 537 (modified): Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for M2-4:2 FTS, M2-6:2 FTS and M2-8:2 FTS in the following samples: (480-183362-H-3-B MS) and (480-183362-H-3-C MSD). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Method 537 (modified): The Isotope Dilution Analyte (IDA) recovery associated with the following sample is below the method recommended limit for 13C2 PFTeDA: PFAS - SLUDGE (190-25707-1). Generally, data quality is not considered affected if the IDA signal-to-noise ratio is greater than 10:1, which is achieved for all IDA in the sample.

Method 537 (modified): Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for M2-4:2 FTS and M2-6:2 FTS in the following sample: (480-183362-H-3-A). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

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

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

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

Client: City of Marysville WWTP
Project/Site: SLUDGE PFAS

Job ID: 190-25707-1

Client Sample ID: PFAS - SLUDGE
Date Collected: 04/14/21 12:30
Date Received: 04/16/21 08:00

Lab Sample ID: 190-25707-1
Matrix: Solid
Percent Solids: 4.0

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<4.7		4.7		ug/Kg	☼	04/20/21 04:14	04/23/21 01:33	1
F-53B Major	<4.7		4.7		ug/Kg	☼	04/20/21 04:14	04/23/21 01:33	1
F-53B Minor	<4.7		4.7		ug/Kg	☼	04/20/21 04:14	04/23/21 01:33	1
4:2 FTS	<47		47		ug/Kg	☼	04/20/21 04:14	04/23/21 01:33	1
6:2 FTS	<47		47		ug/Kg	☼	04/20/21 04:14	04/23/21 01:33	1
8:2 FTS	<47		47		ug/Kg	☼	04/20/21 04:14	04/23/21 01:33	1
HFPO-DA (GenX)	<5.8		5.8		ug/Kg	☼	04/20/21 04:14	04/23/21 01:33	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<47		47		ug/Kg	☼	04/20/21 04:14	04/23/21 01:33	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<47		47		ug/Kg	☼	04/20/21 04:14	04/23/21 01:33	1
Perfluorobutanesulfonic acid (PFBS)	<4.7		4.7		ug/Kg	☼	04/20/21 04:14	04/23/21 01:33	1
Perfluorobutanoic acid (PFBA)	<4.7		4.7		ug/Kg	☼	04/20/21 04:14	04/23/21 01:33	1
Perfluorodecanesulfonic acid (PFDS)	<4.7		4.7		ug/Kg	☼	04/20/21 04:14	04/23/21 01:33	1
Perfluorodecanoic acid (PFDA)	<4.7		4.7		ug/Kg	☼	04/20/21 04:14	04/23/21 01:33	1
Perfluorododecanoic acid (PFDoA)	<4.7		4.7		ug/Kg	☼	04/20/21 04:14	04/23/21 01:33	1
Perfluoroheptanesulfonic Acid (PFHpS)	<4.7		4.7		ug/Kg	☼	04/20/21 04:14	04/23/21 01:33	1
Perfluoroheptanoic acid (PFHpA)	<4.7		4.7		ug/Kg	☼	04/20/21 04:14	04/23/21 01:33	1
Perfluorohexanesulfonic acid (PFHxS)	<4.7		4.7		ug/Kg	☼	04/20/21 04:14	04/23/21 01:33	1
Perfluorohexanoic acid (PFHxA)	<4.7		4.7		ug/Kg	☼	04/20/21 04:14	04/23/21 01:33	1
Perfluorononanesulfonic acid (PFNS)	<4.7		4.7		ug/Kg	☼	04/20/21 04:14	04/23/21 01:33	1
Perfluorononanoic acid (PFNA)	<4.7		4.7		ug/Kg	☼	04/20/21 04:14	04/23/21 01:33	1
Perfluorooctanesulfonamide (FOSA)	<4.7		4.7		ug/Kg	☼	04/20/21 04:14	04/23/21 01:33	1
Perfluorooctanesulfonic acid (PFOS)	**12**	**I**	12		ug/Kg	☼	04/20/21 04:14	04/23/21 01:33	1
Perfluorooctanoic acid (PFOA)	<4.7		4.7		ug/Kg	☼	04/20/21 04:14	04/23/21 01:33	1
Perfluoropentanesulfonic acid (PFPeS)	<4.7	*+	4.7		ug/Kg	☼	04/20/21 04:14	04/23/21 01:33	1
Perfluoropentanoic acid (PFPeA)	<4.7		4.7		ug/Kg	☼	04/20/21 04:14	04/23/21 01:33	1
Perfluorotetradecanoic acid (PFTeA)	<4.7		4.7		ug/Kg	☼	04/20/21 04:14	04/23/21 01:33	1
Perfluorotridecanoic acid (PFTriA)	<4.7		4.7		ug/Kg	☼	04/20/21 04:14	04/23/21 01:33	1
Perfluoroundecanoic acid (PFUnA)	<4.7		4.7		ug/Kg	☼	04/20/21 04:14	04/23/21 01:33	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*87*		*25 - 150*	*04/20/21 04:14*	*04/23/21 01:33*	*1*
13C3 HFPO-DA	*82*		*25 - 150*	*04/20/21 04:14*	*04/23/21 01:33*	*1*
13C4 PFBA	*98*		*25 - 150*	*04/20/21 04:14*	*04/23/21 01:33*	*1*
13C3 PFBS	*70*		*25 - 150*	*04/20/21 04:14*	*04/23/21 01:33*	*1*
13C2 PFDA	*101*		*25 - 150*	*04/20/21 04:14*	*04/23/21 01:33*	*1*
13C2 PFDoA	*41*		*25 - 150*	*04/20/21 04:14*	*04/23/21 01:33*	*1*
13C4 PFHpA	*88*		*25 - 150*	*04/20/21 04:14*	*04/23/21 01:33*	*1*
13C2 PFHxA	*101*		*25 - 150*	*04/20/21 04:14*	*04/23/21 01:33*	*1*
13C5 PFNA	*111*		*25 - 150*	*04/20/21 04:14*	*04/23/21 01:33*	*1*
13C4 PFOA	*89*		*25 - 150*	*04/20/21 04:14*	*04/23/21 01:33*	*1*
13C4 PFOS	*89*		*25 - 150*	*04/20/21 04:14*	*04/23/21 01:33*	*1*
13C5 PFPeA	*73*		*25 - 150*	*04/20/21 04:14*	*04/23/21 01:33*	*1*
13C2 PFTeDA	*19*	*5-	*25 - 150*	*04/20/21 04:14*	*04/23/21 01:33*	*1*
13C2 PFUnA	*83*		*25 - 150*	*04/20/21 04:14*	*04/23/21 01:33*	*1*
d5-NEtFOSAA	*61*		*25 - 150*	*04/20/21 04:14*	*04/23/21 01:33*	*1*
d3-NMeFOSAA	*71*		*25 - 150*	*04/20/21 04:14*	*04/23/21 01:33*	*1*

Client: City of Marysville WWTP
Project/Site: SLUDGE PFAS

Job ID: 190-25707-1

Client Sample ID: PFAS - SLUDGE
Date Collected: 04/14/21 12:30
Date Received: 04/16/21 08:00

Lab Sample ID: 190-25707-1
Matrix: Solid
Percent Solids: 4.0

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
M2-4:2 FTS	*146*		*25 - 150*	*04/20/21 04:14*	*04/23/21 01:33*	*1*
M2-6:2 FTS	*156*	*5+	*25 - 150*	*04/20/21 04:14*	*04/23/21 01:33*	*1*
M2-8:2 FTS	*236*	*5+	*25 - 150*	*04/20/21 04:14*	*04/23/21 01:33*	*1*
18O2 PFHxS	*90*		*25 - 150*	*04/20/21 04:14*	*04/23/21 01:33*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**96.0**		0.1		%			04/19/21 12:57	1
Percent Solids	**4.0**		0.1		%			04/19/21 12:57	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-481096/1-A
Matrix: Solid
Analysis Batch: 482389

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 481096

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.20		0.20		ug/Kg		04/20/21 04:12	04/22/21 22:16	1
F-53B Major	<0.20		0.20		ug/Kg		04/20/21 04:12	04/22/21 22:16	1
F-53B Minor	<0.20		0.20		ug/Kg		04/20/21 04:12	04/22/21 22:16	1
4:2 FTS	<2.0		2.0		ug/Kg		04/20/21 04:12	04/22/21 22:16	1
6:2 FTS	<2.0		2.0		ug/Kg		04/20/21 04:12	04/22/21 22:16	1
8:2 FTS	<2.0		2.0		ug/Kg		04/20/21 04:12	04/22/21 22:16	1
HFPO-DA (GenX)	<0.25		0.25		ug/Kg		04/20/21 04:12	04/22/21 22:16	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<2.0		2.0		ug/Kg		04/20/21 04:12	04/22/21 22:16	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<2.0		2.0		ug/Kg		04/20/21 04:12	04/22/21 22:16	1
Perfluorobutanesulfonic acid (PFBS)	<0.20		0.20		ug/Kg		04/20/21 04:12	04/22/21 22:16	1
Perfluorobutanoic acid (PFBA)	<0.20		0.20		ug/Kg		04/20/21 04:12	04/22/21 22:16	1
Perfluorodecanesulfonic acid (PFDS)	<0.20		0.20		ug/Kg		04/20/21 04:12	04/22/21 22:16	1
Perfluorodecanoic acid (PFDA)	<0.20		0.20		ug/Kg		04/20/21 04:12	04/22/21 22:16	1
Perfluorododecanoic acid (PFDoA)	<0.20		0.20		ug/Kg		04/20/21 04:12	04/22/21 22:16	1
Perfluoroheptanesulfonic Acid (PFHpS)	<0.20		0.20		ug/Kg		04/20/21 04:12	04/22/21 22:16	1
Perfluoroheptanoic acid (PFHpA)	<0.20		0.20		ug/Kg		04/20/21 04:12	04/22/21 22:16	1
Perfluorohexanesulfonic acid (PFHxS)	<0.20		0.20		ug/Kg		04/20/21 04:12	04/22/21 22:16	1
Perfluorohexanoic acid (PFHxA)	<0.20		0.20		ug/Kg		04/20/21 04:12	04/22/21 22:16	1
Perfluorononanesulfonic acid (PFNS)	<0.20		0.20		ug/Kg		04/20/21 04:12	04/22/21 22:16	1
Perfluorononanoic acid (PFNA)	<0.20		0.20		ug/Kg		04/20/21 04:12	04/22/21 22:16	1
Perfluorooctanesulfonamide (FOSA)	<0.20		0.20		ug/Kg		04/20/21 04:12	04/22/21 22:16	1
Perfluorooctanesulfonic acid (PFOS)	<0.50		0.50		ug/Kg		04/20/21 04:12	04/22/21 22:16	1
Perfluorooctanoic acid (PFOA)	<0.20		0.20		ug/Kg		04/20/21 04:12	04/22/21 22:16	1
Perfluoropentanesulfonic acid (PFPeS)	<0.20		0.20		ug/Kg		04/20/21 04:12	04/22/21 22:16	1
Perfluoropentanoic acid (PFPeA)	<0.20		0.20		ug/Kg		04/20/21 04:12	04/22/21 22:16	1
Perfluorotetradecanoic acid (PFTeA)	<0.20		0.20		ug/Kg		04/20/21 04:12	04/22/21 22:16	1
Perfluorotridecanoic acid (PFTriA)	<0.20		0.20		ug/Kg		04/20/21 04:12	04/22/21 22:16	1
Perfluoroundecanoic acid (PFUnA)	<0.20		0.20		ug/Kg		04/20/21 04:12	04/22/21 22:16	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*85*		*25 - 150*	*04/20/21 04:12*	*04/22/21 22:16*	*1*
13C3 HFPO-DA	*85*		*25 - 150*	*04/20/21 04:12*	*04/22/21 22:16*	*1*
13C4 PFBA	*89*		*25 - 150*	*04/20/21 04:12*	*04/22/21 22:16*	*1*
13C3 PFBS	*74*		*25 - 150*	*04/20/21 04:12*	*04/22/21 22:16*	*1*
13C2 PFDA	*87*		*25 - 150*	*04/20/21 04:12*	*04/22/21 22:16*	*1*
13C2 PFDoA	*93*		*25 - 150*	*04/20/21 04:12*	*04/22/21 22:16*	*1*
13C4 PFHpA	*88*		*25 - 150*	*04/20/21 04:12*	*04/22/21 22:16*	*1*
13C2 PFHxA	*87*		*25 - 150*	*04/20/21 04:12*	*04/22/21 22:16*	*1*
13C5 PFNA	*97*		*25 - 150*	*04/20/21 04:12*	*04/22/21 22:16*	*1*
13C4 PFOA	*83*		*25 - 150*	*04/20/21 04:12*	*04/22/21 22:16*	*1*
13C4 PFOS	*89*		*25 - 150*	*04/20/21 04:12*	*04/22/21 22:16*	*1*
13C5 PFPeA	*85*		*25 - 150*	*04/20/21 04:12*	*04/22/21 22:16*	*1*
13C2 PFTeDA	*100*		*25 - 150*	*04/20/21 04:12*	*04/22/21 22:16*	*1*
13C2 PFUnA	*82*		*25 - 150*	*04/20/21 04:12*	*04/22/21 22:16*	*1*
d5-NEtFOSAA	*90*		*25 - 150*	*04/20/21 04:12*	*04/22/21 22:16*	*1*

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: MB 320-481096/1-A
Matrix: Solid
Analysis Batch: 482389

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 481096

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
d3-NMeFOSAA	93		25 - 150	04/20/21 04:12	04/22/21 22:16	1
M2-4:2 FTS	88		25 - 150	04/20/21 04:12	04/22/21 22:16	1
M2-6:2 FTS	105		25 - 150	04/20/21 04:12	04/22/21 22:16	1
M2-8:2 FTS	103		25 - 150	04/20/21 04:12	04/22/21 22:16	1
18O2 PFHxS	94		25 - 150	04/20/21 04:12	04/22/21 22:16	1

Lab Sample ID: LCS 320-481096/2-A
Matrix: Solid
Analysis Batch: 482389

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 481096

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	1.88	1.91		ug/Kg		101	79 - 139
F-53B Major	1.86	2.06		ug/Kg		111	74 - 134
F-53B Minor	1.88	1.89		ug/Kg		101	66 - 136
4:2 FTS	1.87	2.48		ug/Kg		133	68 - 143
6:2 FTS	1.90	1.94	J	ug/Kg		103	73 - 139
8:2 FTS	1.92	1.99	J	ug/Kg		104	75 - 135
HFPO-DA (GenX)	2.00	2.05		ug/Kg		102	53 - 158
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2.00	2.09		ug/Kg		104	72 - 132
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.00	2.16		ug/Kg		108	72 - 132
Perfluorobutanesulfonic acid (PFBS)	1.77	2.04		ug/Kg		115	69 - 129
Perfluorobutanoic acid (PFBA)	2.00	2.00		ug/Kg		100	76 - 136
Perfluorodecanesulfonic acid (PFDS)	1.93	2.05		ug/Kg		106	71 - 131
Perfluorodecanoic acid (PFDA)	2.00	2.22		ug/Kg		111	72 - 132
Perfluorododecanoic acid (PFDoA)	2.00	2.15		ug/Kg		107	71 - 131
Perfluoroheptanesulfonic Acid (PFHpS)	1.90	2.16		ug/Kg		113	76 - 136
Perfluoroheptanoic acid (PFHpA)	2.00	2.21		ug/Kg		110	71 - 131
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.85		ug/Kg		101	62 - 122
Perfluorohexanoic acid (PFHxA)	2.00	1.88		ug/Kg		94	71 - 131
Perfluorononanesulfonic acid (PFNS)	1.92	1.82		ug/Kg		95	72 - 132
Perfluorononanoic acid (PFNA)	2.00	2.06		ug/Kg		103	73 - 133
Perfluorooctanesulfonamide (FOSA)	2.00	2.24		ug/Kg		112	77 - 137
Perfluorooctanesulfonic acid (PFOS)	1.86	1.97		ug/Kg		106	68 - 141
Perfluorooctanoic acid (PFOA)	2.00	2.32		ug/Kg		116	72 - 132
Perfluoropentanesulfonic acid (PFPeS)	1.88	2.45	*+	ug/Kg		131	66 - 126
Perfluoropentanoic acid (PFPeA)	2.00	1.95		ug/Kg		97	69 - 129
Perfluorotetradecanoic acid (PFTeA)	2.00	1.88		ug/Kg		94	67 - 127
Perfluorotridecanoic acid (PFTriA)	2.00	2.11		ug/Kg		105	71 - 131

Method: 537 (modified) - Fluorinated Alkyl Substances (Continued)

Lab Sample ID: LCS 320-481096/2-A
Matrix: Solid
Analysis Batch: 482389

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 481096

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Perfluoroundecanoic acid (PFUnA)			2.00	2.33		ug/Kg		116	66 - 126		

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C8 FOSA	*96*		*25 - 150*
13C3 HFPO-DA	*90*		*25 - 150*
13C4 PFBA	*94*		*25 - 150*
13C3 PFBS	*80*		*25 - 150*
13C2 PFDA	*96*		*25 - 150*
13C2 PFDoA	*90*		*25 - 150*
13C4 PFHpA	*96*		*25 - 150*
13C2 PFHxA	*98*		*25 - 150*
13C5 PFNA	*104*		*25 - 150*
13C4 PFOA	*94*		*25 - 150*
13C4 PFOS	*97*		*25 - 150*
13C5 PFPeA	*94*		*25 - 150*
13C2 PFTeDA	*111*		*25 - 150*
13C2 PFUnA	*86*		*25 - 150*
d5-NEtFOSAA	*99*		*25 - 150*
d3-NMeFOSAA	*101*		*25 - 150*
M2-4:2 FTS	*90*		*25 - 150*
M2-6:2 FTS	*117*		*25 - 150*
M2-8:2 FTS	*101*		*25 - 150*
18O2 PFHxS	*95*		*25 - 150*

Isotope Dilution Summary

Client: City of Marysville WWTP
Project/Site: SLUDGE PFAS

Job ID: 190-25707-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Solid

Prep Type: Total/NA

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		PFOSA	HFPODA	PFBA	C3PFBS	PFDA	PFDoA	C4PFHA	PFHxA
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)
190-25707-1	PFAS - SLUDGE	87	82	98	70	101	41	88	101
LCS 320-481096/2-A	Lab Control Sample	96	90	94	80	96	90	96	98
MB 320-481096/1-A	Method Blank	85	85	89	74	87	93	88	87

		Percent Isotope Dilution Recovery (Acceptance Limits)							
		PFNA	PFOA	PFOS	PFPeA	PFTDA	PFUnA	d5NEFOS	d3NMFOS
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)	(25-150)
190-25707-1	PFAS - SLUDGE	111	89	89	73	19 *5-	83	61	71
LCS 320-481096/2-A	Lab Control Sample	104	94	97	94	111	86	99	101
MB 320-481096/1-A	Method Blank	97	83	89	85	100	82	90	93

		Percent Isotope Dilution Recovery (Acceptance Limits)			
		M242FTS	M262FTS	M282FTS	PFHxS
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	(25-150)
190-25707-1	PFAS - SLUDGE	146	156 *5+	236 *5+	90
LCS 320-481096/2-A	Lab Control Sample	90	117	101	95
MB 320-481096/1-A	Method Blank	88	105	103	94

Surrogate Legend

PFOSA = 13C8 FOSA
HFPODA = 13C3 HFPO-DA
PFBA = 13C4 PFBA
C3PFBS = 13C3 PFBS
PFDA = 13C2 PFDA
PFDoA = 13C2 PFDoA
C4PFHA = 13C4 PFHpA
PFHxA = 13C2 PFHxA
PFNA = 13C5 PFNA
PFOA = 13C4 PFOA
PFOS = 13C4 PFOS
PFPeA = 13C5 PFPeA
PFTDA = 13C2 PFTeDA
PFUnA = 13C2 PFUnA
d5NEFOS = d5-NEtFOSAA
d3NMFOS = d3-NMeFOSAA
M242FTS = M2-4:2 FTS
M262FTS = M2-6:2 FTS
M282FTS = M2-8:2 FTS
PFHxS = 18O2 PFHxS

Method Summary

Client: City of Marysville WWTP
Project/Site: SLUDGE PFAS

Job ID: 190-25707-1

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL SAC
D 2216	Percent Moisture	ASTM	TAL SAC
SHAKE	Shake Extraction with Ultrasonic Bath Extraction	SW846	TAL SAC

Protocol References:

ASTM = ASTM International

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Lab Chronicle

Client: City of Marysville WWTP
Project/Site: SLUDGE PFAS

Job ID: 190-25707-1

Client Sample ID: PFAS - SLUDGE

Lab Sample ID: 190-25707-1

Date Collected: 04/14/21 12:30

Matrix: Solid

Date Received: 04/16/21 08:00

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	480884	04/19/21 12:57	TCS	TAL SAC

Client Sample ID: PFAS - SLUDGE

Lab Sample ID: 190-25707-1

Date Collected: 04/14/21 12:30

Matrix: Solid

Date Received: 04/16/21 08:00

Percent Solids: 4.0

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			481096	04/20/21 04:14	HK	TAL SAC
Total/NA	Analysis	537 (modified)		1	482389	04/23/21 01:33	JRB	TAL SAC

Laboratory References:

TAL SAC = Eurofins TestAmerica, Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Analyst References:

Lab: TAL SAC

Batch Type: Prep

HK = Harmandeep Kaur

Batch Type: Analysis

JRB = John Barnett

TCS = Tammy Saechao

Definitions/Glossary

Client: City of Marysville WWTP
Project/Site: SLUDGE PFAS

Job ID: 190-25707-1

Qualifiers

LCMS

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
*5-	Isotope dilution analyte is outside acceptance limits, low biased.
*5+	Isotope dilution analyte is outside acceptance limits, high biased.
I	Value is EMPC (estimated maximum possible concentration).
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Euorfins Test America, Michigan
10448 Citation Drive Suite 200
Brighton, MI 48116
Phone: (810) 229-2763 Fax: (810) 229-0000

MICHIGAN
190

6.5/06

Chain of Custody Record

TestAmerica
THE LEADER IN ENVIRONMENTAL TESTING

Regulatory program: ☐ DW ☑ NPDES ☐ RCRA ☐ Other

TestAmerica Laboratories, Inc.

Client Contact	Client Project Manager:	Site Contact:	Lab Contact:	COC No:
Company Name: City of Marysville	Bari Wrubel	Bari Wrubel	Sue Schafer	
Address: 980 E Huron Blvd	Telephone: 810-364-8460 810-364-6110	Telephone: 810-364-8460 810-364-6110	Telephone: 810-229-2763	of COCs
City/State/Zip: Marysville, MI 48040	Email: bwrubel@cityofmarysvillemi.com	Analysis Turnaround Time	Analyses	For lab use only
Phone: 810-364-8460 810-364-6110		TAT if different from below ☐ 3 weeks ☐ 2 weeks ☐ 1 week ☐ 2 days ☐ 1 day		Walk-in client
Project Name: Sludge PFAS				Lab sampling
Project Number:	Method of Shipment/Carrier: FEDEX 1 800 463-3339			Job/SDG No:
PO #	Shipping/Tracking No:			

Sample Identification	Sample Date	Sample Time	Matrix: Air	Aqueous	Sediment	Solid	Other:	Containers & Preservatives: H2SO4	HNO3	HCl	NaOH	ZnAc/NaOH	Unpres	Other:	Filtered Sample (Y/N)	Composite=C / Grab=G	PFAS 28 with Dry weight correction	Sample Specific Notes / Special Instructions:
PFAS - Sludge	4/14/2021	12:30PM				x							2			G	x	Project-19000114 AG-Solid-PFAS 28(SAC) + dry weight.

190-25707 Chain of Custody

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return to Client ☑ Disposal By Lab ☐ Archive For ____ Months

Special Instructions/QC Requirements & Comments:

PLEASE RETURN SHIPPER. WE WILL NEED THIS AGAIN NEXT QUARTER. PLEASE ALSO INCLUDE TWO HNO3 PRESERVED BOTTLES

Relinquished by: Bari Wrubel	Company: City of Marysville	Date/Time: 4/14/2021 3:00PM	Received by:	Company: 4-15-21 1339	Date/Time: ETA
Relinquished by:	Company: ETA	Date/Time: 4-15-21 1341	Received by:	Company: 4-16-21 0800	Date/Time: ETA
Relinquished by:	Company:	Date/Time:	Received in Laboratory by:	Company:	Date/Time:

4/27/2021

Eurofins TestAmerica Canton Sample Receipt Form/Narrative
Canton Facility

Login # : 190-25707

Client City of Marysville Site Name Sludge PFAs

Cooler Received on 4-16-21 Opened on 4-16-21

Cooler unpacked by: (me)

FedEx: 1st Grd Exp UPS FAS (Clipper) Client Drop Off TestAmerica Courier Other

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

TestAmerica Cooler # TA Foam Box Client Cooler Box Other

Packing material used: (Bubble Wrap) Foam Plastic Bag None Other

COOLANT: (Wet Ice) Blue Ice Dry Ice Water None

1. Cooler temperature upon receipt ☐ See Multiple Cooler Form
   IR GUN# IR-11 (CF +0.1 °C) Observed Cooler Temp. 0.5 °C Corrected Cooler Temp. 0.6 °C
   IR GUN #IR-12 (CF +0.2°C) Observed Cooler Temp. ____ °C Corrected Cooler Temp. ____ °C

2. Were tamper/custody seals on the outside of the cooler(s)? If Yes Quantity 1	(Yes) No	
-Were the seals on the outside of the cooler(s) signed & dated?	Yes (No) NA	
-Were tamper/custody seals on the bottle(s) or bottle kits (LLHg/MeHg)?	Yes (No)	
-Were tamper/custody seals intact and uncompromised?	Yes No (NA)	
3. Shippers' packing slip attached to the cooler(s)?	Yes (No)	
4. Did custody papers accompany the sample(s)?	(Yes) No	
5. Were the custody papers relinquished & signed in the appropriate place?	(Yes) No	
6. Was/were the person(s) who collected the samples clearly identified on the COC?	Yes (No)	
7. Did all bottles arrive in good condition (Unbroken)?	(Yes) No	
8. Could all bottle labels (ID/Date/Time) be reconciled with the COC?	(Yes) No	
9. For each sample, does the COC specify preservatives (Y/N) # of containers (Y/N), and sample type of grab/comp (Y/N)?		
10. Were correct bottle(s) used for the test(s) indicated? (me) 4-16-21	(Yes) No	
11. Sufficient quantity received to perform indicated analyses?	(Yes) No	
12. Are these work share samples and all listed on the COC?	Yes (No)	
If yes, Questions 13-17 have been checked at the originating laboratory.		
13. Were all preserved sample(s) at the correct pH upon receipt?	Yes No (NA)	pH Strip Lot# HC022887
14. Were VOAs on the COC?	Yes (No)	
15. Were air bubbles >6 mm in any VOA vials? ● ⬅ Larger than this.	Yes No (NA)	
16. Was a VOA trip blank present in the cooler(s)? Trip Blank Lot # ____	Yes (No)	
17. Was a LL Hg or Me Hg trip blank present? ____	Yes (No)	

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

Contacted PM ____ Date ____ by ____ via Verbal Voice Mail Other

Concerning ____

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

Samples processed by:

19. SAMPLE CONDITION

Sample(s) ____ were received after the recommended holding time had expired.
Sample(s) ____ were received in a broken container.
Sample(s) ____ were received with bubble >6 mm in diameter. (Notify PM)

20. SAMPLE PRESERVATION

Sample(s) ____ were further preserved in the laboratory.
Time preserved: ____ Preservative(s) added/Lot number(s): ____

VOA Sample Preservation - Date/Time VOAs Frozen: ____

WI-NC-099

Eurofins TestAmerica, Canton
4101 Shuffel Street NW
North Canton, OH 44720
Phone: 330-497-9396 Fax: 330-497-0772

Chain of Custody Record

eurofins Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Schafer, Sue	Carrier Tracking No(s):	COC No: 240-135053.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Sue.Schafer@Eurofinset.com	State of Origin: Michigan	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note):		Job #: 190-25707-1
Address: 880 Riverside Parkway,	Due Date Requested: 4/29/2021			
City: West Sacramento	TAT Requested (days):			
State, Zip: CA, 95605				
Phone: 916-373-5600(Tel) 916-372-1059(Fax)	PO #:			
Email:	WO #:			
Project Name: SLUDGE PFAS	Project #: 19000114			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	Moisture/ Percent Moisture	PFC_IDA/Shake_Bath_14D PFAS 28	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
PFAS - SLUDGE (190-25707-1)	4/14/21	12:30 Eastern		Solid			X	X	2	

Note: Since laboratory accreditations are subject to change, Eurofins TestAmerica places the ownership of method, analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins TestAmerica laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins TestAmerica attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins TestAmerica.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	4/16/21 1753	ETA		4-17-21 10:05	ETASAC
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ∆ Yes ∆ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks: 1.0

NC 4-17-21, Sample shows discoloration. 2 of 2, NC 4-17-21

Ver: 11/01/2020