13-Aug-2021

Jeff Lampi
City of Escanaba WWTP
P.O. Box 948
Escanaba, MI 49829

Re: **Sludge Analyses** Work Order: **21080360**

Dear Jeff,

ALS Environmental received 1 sample on 04-Aug-2021 10:30 AM for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental - Holland and for only the analyses requested.

Sample results are compliant with industry accepted practices and Quality Control results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 24.

If you have any questions regarding this report, please feel free to contact me:

ADDRESS: 3352 128th Avenue, Holland, MI, USA
PHONE: +1 (616) 399-6070 FAX: +1 (616) 399-6185

Sincerely,

Electronically approved by: Bill Carey

Bill Carey
Project Manager

ALS Group, USA

Date: 13-Aug-21

Client: City of Escanaba WWTP
Project: Sludge Analyses
Work Order: **21080360**

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
21080360-01	Tank #5 Biosolids	Sludge		8/3/2021 10:30	8/4/2021 10:30	☐

ALS Group, USA

Date: 13-Aug-21

Client: City of Escanaba WWTP
Project: Sludge Analyses
WorkOrder: **21080360**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
**	Estimated Value
a	Analyte is non-accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
Hr	BOD/CBOD - Sample was reset outside Hold Time, value should be considered estimated.
J	Analyte is present at an estimated concentration between the MDL and Report Limit
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL
X	Analyte was detected in the Method Blank between the MDL and Reporting Limit, sample results may exhibit background or reagent contamination at the observed level.

Acronym	Description
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

Units Reported	Description
% of sample	Percent of Sample

Client: City of Escanaba WWTP
Project: Sludge Analyses
Work Order: 21080360

Case Narrative

Batch 181498, Method D7968-17a, Sample Tank #5 Biosolids (21080360-01A): One or more surrogate recoveries were below the lower control limits. The sample results may be biased low. 13C2-PFDoA, 13C2-PFUnA, 13C4-PFOS, 13C8-FOSA

Batch 181554, Method D7968-17a, Sample Tank #5 Biosolids (21080360-01A): One or more surrogate recoveries were below the lower control limits. The sample results may be biased low. 13C2-PFTeA

Batch 181498, Method D7968-17a, Sample LCS1-181498: The LCS recovery was within acceptance criteria, but recovered below the MDL and does not show on the final report. No qualification necessary. Raw data available upon request: PFOS

ALS Group, USA

Date: *13-Aug-2021*

Client: City of Escanaba WWTP
Project: Sludge Analyses
Sample ID: Tank #5 Biosolids
Collection Date: 8/3/2021 10:30 AM

Work Order: 21080360
Lab ID: 21080360-01
Matrix: SLUDGE

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
PFAS BY LC-MS-MS			**D7968-17A**	Prep: D7968-17a 8/5/21 17:00		Analyst: **SK**
Perfluorobutanoic Acid (PFBA)	**3.2**		**2.2**	**µg/Kg-dry**	1	8/5/2021 08:37 PM
Perfluoropentanoic Acid (PFPeA)	ND		2.2	µg/Kg-dry	1	8/5/2021 08:37 PM
Perfluorohexanoic Acid (PFHxA)	**3.3**		**2.2**	**µg/Kg-dry**	1	8/5/2021 08:37 PM
Perfluoroheptanoic Acid (PFHpA)	ND		2.2	µg/Kg-dry	1	8/5/2021 08:37 PM
Perfluorooctanoic Acid (PFOA)	**0.54**		**0.45**	**µg/Kg-dry**	1	8/5/2021 08:37 PM
Perfluorononanoic Acid (PFNA)	**1.8**		**0.46**	**µg/Kg-dry**	1	8/6/2021 04:46 PM
Perfluorodecanoic Acid (PFDA)	ND		2.2	µg/Kg-dry	1	8/5/2021 08:37 PM
Perfluoroundecanoic Acid (PFUnA)	ND		2.2	µg/Kg-dry	1	8/5/2021 08:37 PM
Perfluorododecanoic Acid (PFDoA)	ND		2.2	µg/Kg-dry	1	8/5/2021 08:37 PM
Perfluorotridecanoic Acid (PFTriA)	ND		2.3	µg/Kg-dry	1	8/6/2021 04:46 PM
Perfluorotetradecanoic Acid (PFTeA)	ND		2.3	µg/Kg-dry	1	8/6/2021 04:46 PM
Perfluorobutanesulfonic Acid (PFBS)	ND		0.45	µg/Kg-dry	1	8/5/2021 08:37 PM
Perfluoropentanesulfonic Acid (PFPeS)	ND		0.45	µg/Kg-dry	1	8/5/2021 08:37 PM
Perfluorohexanesulfonic Acid (PFHxS)	ND		2.2	µg/Kg-dry	1	8/5/2021 08:37 PM
Perfluoroheptanesulfonic Acid (PFHpS)	ND		2.2	µg/Kg-dry	1	8/5/2021 08:37 PM
Perfluorooctanesulfonic Acid (PFOS)	**4.6**		**0.45**	**µg/Kg-dry**	1	8/5/2021 08:37 PM
Perfluorononanesulfonic Acid (PFNS)	ND		2.2	µg/Kg-dry	1	8/5/2021 08:37 PM
Perfluorodecanesulfonic Acid (PFDS)	**2.2**		**0.45**	**µg/Kg-dry**	1	8/5/2021 08:37 PM
Fluorotelomer Sulphonic Acid 4:2 (FtS 4:2)	ND		2.2	µg/Kg-dry	1	8/5/2021 08:37 PM
Fluorotelomer Sulphonic Acid 6:2 (FtS 6:2)	ND		2.2	µg/Kg-dry	1	8/5/2021 08:37 PM
Fluorotelomer Sulphonic Acid 8:2 (FtS 8:2)	ND		2.2	µg/Kg-dry	1	8/5/2021 08:37 PM
Perfluorooctanesulfonamide (PFOSA)	ND		0.45	µg/Kg-dry	1	8/5/2021 08:37 PM
N-Ethylperfluorooctanesulfonamidoacetic Acid	**3.8**		**2.2**	**µg/Kg-dry**	1	8/5/2021 08:37 PM
N-Methylperfluorooctanesulfonamidoacetic Acid	**6.5**		**2.2**	**µg/Kg-dry**	1	8/5/2021 08:37 PM
11Cl-Pf3OUdS	ND		0.45	µg/Kg-dry	1	8/5/2021 08:37 PM
4,8-Dioxa-3H-perfluorononanoic Acid (DONA)	ND		0.45	µg/Kg-dry	1	8/5/2021 08:37 PM
9Cl-PF3ONS	ND		0.45	µg/Kg-dry	1	8/5/2021 08:37 PM
Hexafluoropropylene oxide dimer acid (HFPO-DA)	ND		2.2	µg/Kg-dry	1	8/5/2021 08:37 PM
Surr: 13C4-PFBA	*86.0*		*50-130*	*%REC*	1	8/5/2021 08:37 PM
Surr: 13C5-PFPeA	*90.8*		*50-130*	*%REC*	1	8/5/2021 08:37 PM
Surr: 13C2-PFHxA	*86.1*		*50-130*	*%REC*	1	8/5/2021 08:37 PM
Surr: 13C4-PFHpA	*81.9*		*50-130*	*%REC*	1	8/5/2021 08:37 PM
Surr: 13C4-PFOA	*80.3*		*70-130*	*%REC*	1	8/5/2021 08:37 PM
Surr: 13C5-PFNA	*83.7*		*70-130*	*%REC*	1	8/5/2021 08:37 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

Client: City of Escanaba WWTP
Project: Sludge Analyses **Work Order:** 21080360
Sample ID: Tank #5 Biosolids **Lab ID:** 21080360-01
Collection Date: 8/3/2021 10:30 AM **Matrix:** SLUDGE

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Surr: 13C5-PFNA	*96.1*		*70-130*	*%REC*	1	8/6/2021 04:46 PM
Surr: 13C2-PFDA	*74.4*		*70-130*	*%REC*	1	8/5/2021 08:37 PM
Surr: 13C2-PFUnA	*64.2*	S	*70-130*	*%REC*	1	8/5/2021 08:37 PM
Surr: 13C2-PFDoA	*38.5*	S	*70-130*	*%REC*	1	8/5/2021 08:37 PM
Surr: 13C2-PFTeA	*6.45*	S	*50-130*	*%REC*	1	8/6/2021 04:46 PM
Surr: 13C3-PFBS	*67.1*		*50-130*	*%REC*	1	8/5/2021 08:37 PM
Surr: 18O2-PFHxS	*81.3*		*70-130*	*%REC*	1	8/5/2021 08:37 PM
Surr: 13C4-PFOS	*58.7*	S	*70-130*	*%REC*	1	8/5/2021 08:37 PM
Surr: 13C2-FtS 4:2	*96.4*		*50-130*	*%REC*	1	8/5/2021 08:37 PM
Surr: 13C2-FtS 6:2	*110*		*50-130*	*%REC*	1	8/5/2021 08:37 PM
Surr: 13C2-FtS 8:2	*90.6*		*50-130*	*%REC*	1	8/5/2021 08:37 PM
Surr: 13C8-FOSA	*21.4*	S	*50-130*	*%REC*	1	8/5/2021 08:37 PM
Surr: d3-N-MeFOSAA	*71.3*		*50-130*	*%REC*	1	8/5/2021 08:37 PM
Surr: d5-N-EtFOSAA	*86.7*		*50-130*	*%REC*	1	8/5/2021 08:37 PM
Surr: 13C3-HFPO-DA	*70.5*		*50-130*	*%REC*	1	8/5/2021 08:37 PM
MOISTURE			**SW3550C**			Analyst: **ALG**
Moisture	**94**		**0.10**	**% of sample**	1	8/9/2021 10:50 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group, USA

Date: 13-Aug-21

Client: City of Escanaba WWTP

Work Order: 21080360

Project: Sludge Analyses

QC BATCH REPORT

Batch ID: **181498** Instrument ID **LCMS1** Method: **D7968-17a**

MBLK1 Sample ID: **MBLK1-181498-181498** Units: **ng/Kg** Analysis Date: **8/5/2021 06:10 PM**

Client ID: Run ID: **LCMS1_210805B** SeqNo: **7646500** Prep Date: **8/5/2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Perfluorobutanoic Acid (PFBA)	ND	120	0	0	0		0			
Perfluoropentanoic Acid (PFPeA)	ND	120	0	0	0		0			
Perfluorohexanoic Acid (PFHxA)	ND	120	0	0	0		0			
Perfluoroheptanoic Acid (PFHpA)	ND	120	0	0	0		0			
Perfluorooctanoic Acid (PFOA)	ND	25	0	0	0		0			
Perfluorodecanoic Acid (PFDA)	ND	120	0	0	0		0			
Perfluoroundecanoic Acid (PFUnA)	ND	120	0	0	0		0			
Perfluorododecanoic Acid (PFDoA)	ND	120	0	0	0		0			
Perfluorotridecanoic Acid (PFTriA)	ND	120	0	0	0		0			
Perfluorotetradecanoic Acid (PFTeA)	ND	120	0	0	0		0			
Perfluorobutanesulfonic Acid (PFBS)	ND	25	0	0	0		0			
Perfluoropentanesulfonic Acid (PFPeS	ND	25	0	0	0		0			
Perfluorohexanesulfonic Acid (PFHxS)	ND	120	0	0	0		0			
Perfluoroheptanesulfonic Acid (PFHpS	ND	120	0	0	0		0			
Perfluorooctanesulfonic Acid (PFOS)	ND	25	0	0	0		0			
Perfluorononanesulfonic Acid (PFNS)	ND	120	0	0	0		0			
Perfluorodecanesulfonic Acid (PFDS)	ND	25	0	0	0		0			
Fluorotelomer Sulphonic Acid 4:2 (FtS	ND	120	0	0	0		0			
Fluorotelomer Sulphonic Acid 6:2 (FtS	ND	120	0	0	0		0			
Fluorotelomer Sulphonic Acid 8:2 (FtS	ND	120	0	0	0		0			
Perfluorooctanesulfonamide (PFOSA)	ND	25	0	0	0		0			
N-Ethylperfluorooctanesulfonamidoace	ND	120	0	0	0		0			
N-Methylperfluorooctanesulfonamidoa	ND	120	0	0	0		0			
11Cl-Pf3OUdS	ND	25	0	0	0		0			
4,8-Dioxa-3H-perfluorononanoic Acid (	ND	25	0	0	0		0			
9Cl-PF3ONS	ND	25	0	0	0		0			
Hexafluoropropylene oxide dimer acid	ND	120	0	0	0		0			
Surr: 13C4-PFBA	*433.8*	0	*400*	0	*108*	*50-130*	0			
Surr: 13C5-PFPeA	*413*	0	*400*	0	*103*	*50-130*	0			
Surr: 13C2-PFHxA	*417.3*	0	*400*	0	*104*	*50-130*	0			
Surr: 13C4-PFHpA	*400.5*	0	*400*	0	*100*	*50-130*	0			
Surr: 13C4-PFOA	*450*	0	*400*	0	*112*	*70-130*	0			
Surr: 13C5-PFNA	*419*	0	*400*	0	*105*	*70-130*	0			
Surr: 13C2-PFDA	*413.7*	0	*400*	0	*103*	*70-130*	0			
Surr: 13C2-PFUnA	*426.9*	0	*400*	0	*107*	*70-130*	0			
Surr: 13C2-PFDoA	*421.2*	0	*400*	0	*105*	*70-130*	0			
Surr: 13C2-PFTeA	*373.1*	0	*400*	0	*93.3*	*50-130*	0			
Surr: 13C3-PFBS	*376.6*	0	*400*	0	*94.1*	*50-130*	0			
Surr: 18O2-PFHxS	*390.1*	0	*378*	0	*103*	*70-130*	0			
Surr: 13C4-PFOS	*376.5*	0	*383*	0	*98.3*	*70-130*	0			
Surr: 13C2-FtS 4:2	*276.1*	0	*373*	0	*74*	*50-130*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **181498** Instrument ID **LCMS1** Method: **D7968-17a**

Surr: 13C2-FtS 6:2	*353.4*	0	*380*	0	*93*	*50-130*	0
Surr: 13C2-FtS 8:2	*292.9*	0	*383*	0	*76.5*	*50-130*	0
Surr: 13C8-FOSA	*410.6*	0	*400*	0	*103*	*50-130*	0
Surr: d3-N-MeFOSAA	*379.4*	0	*400*	0	*94.9*	*50-130*	0
Surr: d5-N-EtFOSAA	*454.8*	0	*400*	0	*114*	*50-130*	0
Surr: 13C3-HFPO-DA	*452.4*	0	*400*	0	*113*	*50-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: City of Escanaba WWTP
Work Order: 21080360
Project: Sludge Analyses

QC BATCH REPORT

Batch ID: **181498** Instrument ID **LCMS1** Method: **D7968-17a**

MBLK2	Sample ID: **MBLK2-181498-181498**				Units: **ng/Kg**			Analysis Date: **8/5/2021 06:52 PM**			
Client ID:		Run ID: **LCMS1_210805B**			SeqNo: **7646504**			Prep Date: **8/5/2021**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Perfluorobutanoic Acid (PFBA)	ND	120	0	0	0		0			
Perfluoropentanoic Acid (PFPeA)	ND	120	0	0	0		0			
Perfluorohexanoic Acid (PFHxA)	ND	120	0	0	0		0			
Perfluoroheptanoic Acid (PFHpA)	ND	120	0	0	0		0			
Perfluorooctanoic Acid (PFOA)	ND	25	0	0	0		0			
Perfluorodecanoic Acid (PFDA)	ND	120	0	0	0		0			
Perfluoroundecanoic Acid (PFUnA)	ND	120	0	0	0		0			
Perfluorododecanoic Acid (PFDoA)	ND	120	0	0	0		0			
Perfluorotridecanoic Acid (PFTriA)	ND	120	0	0	0		0			
Perfluorotetradecanoic Acid (PFTeA)	ND	120	0	0	0		0			
Perfluorobutanesulfonic Acid (PFBS)	ND	25	0	0	0		0			
Perfluoropentanesulfonic Acid (PFPeS	ND	25	0	0	0		0			
Perfluorohexanesulfonic Acid (PFHxS)	ND	120	0	0	0		0			
Perfluoroheptanesulfonic Acid (PFHpS	ND	120	0	0	0		0			
Perfluorooctanesulfonic Acid (PFOS)	ND	25	0	0	0		0			
Perfluorononanesulfonic Acid (PFNS)	ND	120	0	0	0		0			
Perfluorodecanesulfonic Acid (PFDS)	ND	25	0	0	0		0			
Fluorotelomer Sulphonic Acid 4:2 (FtS	ND	120	0	0	0		0			
Fluorotelomer Sulphonic Acid 6:2 (FtS	ND	120	0	0	0		0			
Fluorotelomer Sulphonic Acid 8:2 (FtS	ND	120	0	0	0		0			
Perfluorooctanesulfonamide (PFOSA)	ND	25	0	0	0		0			
N-Ethylperfluorooctanesulfonamidoace	ND	120	0	0	0		0			
N-Methylperfluorooctanesulfonamidoa	ND	120	0	0	0		0			
11Cl-Pf3OUdS	ND	25	0	0	0		0			
4,8-Dioxa-3H-perfluorononanoic Acid (	ND	25	0	0	0		0			
9Cl-PF3ONS	ND	25	0	0	0		0			
Hexafluoropropylene oxide dimer acid	ND	120	0	0	0		0			
Surr: 13C4-PFBA	*420.9*	0	*400*	0	*105*	*50-130*	0			
Surr: 13C5-PFPeA	*412.9*	0	*400*	0	*103*	*50-130*	0			
Surr: 13C2-PFHxA	*385.8*	0	*400*	0	*96.5*	*50-130*	0			
Surr: 13C4-PFHpA	*381.9*	0	*400*	0	*95.5*	*50-130*	0			
Surr: 13C4-PFOA	*448.8*	0	*400*	0	*112*	*70-130*	0			
Surr: 13C5-PFNA	*416.3*	0	*400*	0	*104*	*70-130*	0			
Surr: 13C2-PFDA	*407.7*	0	*400*	0	*102*	*70-130*	0			
Surr: 13C2-PFUnA	*402.8*	0	*400*	0	*101*	*70-130*	0			
Surr: 13C2-PFDoA	*423.3*	0	*400*	0	*106*	*70-130*	0			
Surr: 13C2-PFTeA	*347.7*	0	*400*	0	*86.9*	*50-130*	0			
Surr: 13C3-PFBS	*367.4*	0	*400*	0	*91.9*	*50-130*	0			
Surr: 18O2-PFHxS	*380.5*	0	*378*	0	*101*	*70-130*	0			
Surr: 13C4-PFOS	*368.6*	0	*383*	0	*96.3*	*70-130*	0			
Surr: 13C2-FtS 4:2	*282.6*	0	*373*	0	*75.8*	*50-130*	0			
Surr: 13C2-FtS 6:2	*333*	0	*380*	0	*87.6*	*50-130*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **181498** Instrument ID **LCMS1** Method: **D7968-17a**

Surr: 13C2-FtS 8:2	*326.5*	0	*383*	0	*85.2*	*50-130*	0
Surr: 13C8-FOSA	*411.3*	0	*400*	0	*103*	*50-130*	0
Surr: d3-N-MeFOSAA	*397*	0	*400*	0	*99.3*	*50-130*	0
Surr: d5-N-EtFOSAA	*428.5*	0	*400*	0	*107*	*50-130*	0
Surr: 13C3-HFPO-DA	*393.5*	0	*400*	0	*98.4*	*50-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: City of Escanaba WWTP
Work Order: 21080360
Project: Sludge Analyses

QC BATCH REPORT

Batch ID: **181498** Instrument ID **LCMS1** Method: **D7968-17a**

MS	Sample ID: **21080175-03A MS**				Units: **ng/Kg**			Analysis Date: **8/5/2021 07:03 PM**		
Client ID:		Run ID: **LCMS1_210805B**			SeqNo: **7646505**		Prep Date: **8/5/2021**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Perfluorobutanoic Acid (PFBA)	488.8	120	492.6	16.05	96	50-130	0			
Perfluoropentanoic Acid (PFPeA)	456.1	120	492.6	-5.247	93.6	70-130	0			
Perfluorohexanoic Acid (PFHxA)	429.9	120	492.6	0	87.3	50-130	0			
Perfluoroheptanoic Acid (PFHpA)	452.6	120	492.6	0	91.9	50-130	0			
Perfluorooctanoic Acid (PFOA)	494.7	25	492.6	12.75	97.8	70-130	0			
Perfluorodecanoic Acid (PFDA)	505.1	120	492.6	19.42	98.6	70-130	0			
Perfluoroundecanoic Acid (PFUnA)	544.7	120	492.6	58.19	98.8	70-130	0			
Perfluorododecanoic Acid (PFDoA)	483.5	120	492.6	4.806	97.2	70-130	0			
Perfluorotridecanoic Acid (PFTriA)	451.5	120	492.6	11.36	89.4	70-130	0			
Perfluorotetradecanoic Acid (PFTeA)	399.3	120	492.6	4.319	80.2	70-130	0			
Perfluorobutanesulfonic Acid (PFBS)	394.8	25	435.5	0	90.7	70-130	0			
Perfluoropentanesulfonic Acid (PFPeS	453.4	25	462.1	0	98.1	70-130	0			
Perfluorohexanesulfonic Acid (PFHxS)	406.7	120	448.3	11.3	88.2	70-130	0			
Perfluoroheptanesulfonic Acid (PFHpS	395	120	469	0	84.2	70-130	0			
Perfluorooctanesulfonic Acid (PFOS)	550.9	25	457.1	95.95	99.5	70-130	0			
Perfluorononanesulfonic Acid (PFNS)	416.6	120	472.9	10.78	85.8	70-130	0			
Perfluorodecanesulfonic Acid (PFDS)	432.9	25	474.9	12.82	88.5	70-130	0			
Fluorotelomer Sulphonic Acid 4:2 (FtS	422.3	120	460.1	0	91.8	70-130	0			
Fluorotelomer Sulphonic Acid 6:2 (FtS	490.1	120	467	0	105	70-130	0			
Fluorotelomer Sulphonic Acid 8:2 (FtS	494.2	120	471.9	0	105	70-130	0			
Perfluorooctanesulfonamide (PFOSA)	460.4	25	492.6	11.84	91.1	70-130	0			
N-Ethylperfluorooctanesulfonamidoace	634.9	120	492.6	146.4	99.2	70-130	0			
N-Methylperfluorooctanesulfonamidoa	499.9	120	492.6	0	101	70-130	0			
11Cl-Pf3OUdS	475.5	25	464	0	102	70-130	0			
4,8-Dioxa-3H-perfluorononanoic Acid (	457.7	25	464	0	98.6	70-130	0			
9Cl-PF3ONS	413.7	25	459.1	0	90.1	70-130	0			
Hexafluoropropylene oxide dimer acid	491.3	120	492.6	0	99.7	50-130	0			
Surr: 13C4-PFBA	*377.3*	0	*394.1*	0	*95.7*	*50-130*	0			
Surr: 13C5-PFPeA	*360.2*	0	*394.1*	0	*91.4*	*50-130*	0			
Surr: 13C2-PFHxA	*348.7*	0	*394.1*	0	*88.5*	*50-130*	0			
Surr: 13C4-PFHpA	*358.4*	0	*394.1*	0	*90.9*	*50-130*	0			
Surr: 13C4-PFOA	*389.7*	0	*394.1*	0	*98.9*	*70-130*	0			
Surr: 13C5-PFNA	*393.3*	0	*394.1*	0	*99.8*	*70-130*	0			
Surr: 13C2-PFDA	*383*	0	*394.1*	0	*97.2*	*70-130*	0			
Surr: 13C2-PFUnA	*371.5*	0	*394.1*	0	*94.3*	*70-130*	0			
Surr: 13C2-PFDoA	*349.1*	0	*394.1*	0	*88.6*	*70-130*	0			
Surr: 13C2-PFTeA	*275.9*	0	*394.1*	0	*70*	*50-130*	0			
Surr: 13C3-PFBS	*334.9*	0	*394.1*	0	*85*	*50-130*	0			
Surr: 18O2-PFHxS	*358.5*	0	*372.4*	0	*96.3*	*70-130*	0			
Surr: 13C4-PFOS	*310.3*	0	*377.3*	0	*82.2*	*70-130*	0			
Surr: 13C2-FtS 4:2	*275.4*	0	*367.5*	0	*74.9*	*50-130*	0			
Surr: 13C2-FtS 6:2	*284.5*	0	*374.4*	0	*76*	*50-130*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **181498** Instrument ID **LCMS1** Method: **D7968-17a**

Surr: 13C2-FtS 8:2	*308.9*	0	*377.3*	0	*81.9*	*50-130*	0
Surr: 13C8-FOSA	*369*	0	*394.1*	0	*93.6*	*50-130*	0
Surr: d3-N-MeFOSAA	*353.7*	0	*394.1*	0	*89.8*	*50-130*	0
Surr: d5-N-EtFOSAA	*411.8*	0	*394.1*	0	*105*	*50-130*	0
Surr: 13C3-HFPO-DA	*370*	0	*394.1*	0	*93.9*	*50-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: City of Escanaba WWTP
Work Order: 21080360
Project: Sludge Analyses

QC BATCH REPORT

Batch ID: **181498** Instrument ID **LCMS1** Method: **D7968-17a**

DUP	Sample ID: **21080175-02A DUP**				Units: **ng/Kg**		Analysis Date: **8/5/2021 07:45 PM**			
Client ID:		Run ID: **LCMS1_210805B**			SeqNo: **7646509**		Prep Date: **8/5/2021**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Perfluorobutanoic Acid (PFBA)	ND	120	0	0	0		43.87	0	30	
Perfluoropentanoic Acid (PFPeA)	ND	120	0	0	0		20.18	0	30	
Perfluorohexanoic Acid (PFHxA)	17.84	120	0	0	0		22.34	0	30	J
Perfluoroheptanoic Acid (PFHpA)	22.24	120	0	0	0		11.24	0	30	J
Perfluorooctanoic Acid (PFOA)	201.2	24	0	0	0		196.8	2.2	30	
Perfluorodecanoic Acid (PFDA)	20.08	120	0	0	0		26.88	0	30	J
Perfluoroundecanoic Acid (PFUnA)	48.71	120	0	0	0		37.38	0	30	J
Perfluorododecanoic Acid (PFDoA)	ND	120	0	0	0		4.534	0	30	
Perfluorotridecanoic Acid (PFTriA)	ND	120	0	0	0		10.6	0	30	
Perfluorotetradecanoic Acid (PFTeA)	ND	120	0	0	0		7.3	0	30	
Perfluorobutanesulfonic Acid (PFBS)	ND	24	0	0	0		0	0	30	
Perfluoropentanesulfonic Acid (PFPeS	ND	24	0	0	0		0	0	30	
Perfluorohexanesulfonic Acid (PFHxS)	ND	120	0	0	0		25.24	0	30	
Perfluoroheptanesulfonic Acid (PFHpS	26.82	120	0	0	0		26.37	0	30	J
Perfluorooctanesulfonic Acid (PFOS)	4400	24	0	0	0		4132	6.28	30	
Perfluorononanesulfonic Acid (PFNS)	ND	120	0	0	0		4.913	0	30	
Perfluorodecanesulfonic Acid (PFDS)	ND	24	0	0	0		0	0	30	
Fluorotelomer Sulphonic Acid 4:2 (FtS	ND	120	0	0	0		0	0	30	
Fluorotelomer Sulphonic Acid 6:2 (FtS	ND	120	0	0	0		0	0	30	
Fluorotelomer Sulphonic Acid 8:2 (FtS	ND	120	0	0	0		0	0	30	
Perfluorooctanesulfonamide (PFOSA)	116.7	24	0	0	0		125.1	6.99	30	
N-Ethylperfluorooctanesulfonamidoace	1663	120	0	0	0		1781	6.88	30	
N-Methylperfluorooctanesulfonamidoa	ND	120	0	0	0		0	0	30	
11Cl-Pf3OUdS	ND	24	0	0	0		0	0	30	
4,8-Dioxa-3H-perfluorononanoic Acid (	ND	24	0	0	0		0	0	30	
9Cl-PF3ONS	ND	24	0	0	0		0	0	30	
Hexafluoropropylene oxide dimer acid	ND	120	0	0	0		0	0	30	
Surr: 13C4-PFBA	*363*	0	*390.2*	0	*93*	*50-130*	370.5	*2.04*	*30*	
Surr: 13C5-PFPeA	*366.3*	0	*390.2*	0	*93.9*	*50-130*	368.5	*0.598*	*30*	
Surr: 13C2-PFHxA	*352.8*	0	*390.2*	0	*90.4*	*50-130*	354.2	*0.397*	*30*	
Surr: 13C4-PFHpA	*361.4*	0	*390.2*	0	*92.6*	*50-130*	360.2	*0.348*	*30*	
Surr: 13C4-PFOA	*368.5*	0	*390.2*	0	*94.4*	*70-130*	359.4	*2.49*	*30*	
Surr: 13C5-PFNA	*379.7*	0	*390.2*	0	*97.3*	*70-130*	377.8	*0.492*	*30*	
Surr: 13C2-PFDA	*360.9*	0	*390.2*	0	*92.5*	*70-130*	357.6	*0.93*	*30*	
Surr: 13C2-PFUnA	*354.9*	0	*390.2*	0	*91*	*70-130*	354.4	*0.163*	*30*	
Surr: 13C2-PFDoA	*331.6*	0	*390.2*	0	*85*	*70-130*	330.5	*0.325*	*30*	
Surr: 13C2-PFTeA	*208.5*	0	*390.2*	0	*53.4*	*50-130*	221.8	*6.18*	*30*	
Surr: 13C3-PFBS	*329.4*	0	*390.2*	0	*84.4*	*50-130*	353.3	*6.98*	*30*	
Surr: 18O2-PFHxS	*330*	0	*368.8*	0	*89.5*	*70-130*	315.8	*4.38*	*30*	
Surr: 13C4-PFOS	*331.9*	0	*373.7*	0	*88.8*	*70-130*	312	*6.17*	*30*	
Surr: 13C2-FtS 4:2	*230.4*	0	*363.9*	0	*63.3*	*50-130*	234.9	*1.94*	*30*	
Surr: 13C2-FtS 6:2	*287.4*	0	*370.7*	0	*77.5*	*50-130*	312.3	*8.3*	*30*	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Batch ID: **181498** Instrument ID **LCMS1** Method: **D7968-17a**

Surr: 13C2-FtS 8:2	*310.6*	0	*373.7*	0	*83.1*	*50-130*	268.9	*14.4*	*30*
Surr: 13C8-FOSA	*360.1*	0	*390.2*	0	*92.3*	*50-130*	347.3	*3.62*	*30*
Surr: d3-N-MeFOSAA	*352.9*	0	*390.2*	0	*90.4*	*50-130*	361.7	*2.45*	*30*
Surr: d5-N-EtFOSAA	*412.8*	0	*390.2*	0	*106*	*50-130*	373	*10.1*	*30*
Surr: 13C3-HFPO-DA	*347.3*	0	*390.2*	0	*89*	*50-130*	302.4	*13.8*	*30*

LCS1 Sample ID: **LCS1-181498-181498** Units: **ng/Kg** Analysis Date: **8/5/2021 06:21 PM**

Client ID: Run ID: **LCMS1_210805B** SeqNo: **7646501** Prep Date: **8/5/2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Perfluorooctanoic Acid (PFOA)	23.25	25	25	0	93	35-150	0			J
Perfluorobutanesulfonic Acid (PFBS)	20.93	25	22	0	95.1	35-150	0			J
Perfluoropentanesulfonic Acid (PFPeS	23.18	25	23.5	0	98.6	35-150	0			J
Perfluorooctanesulfonic Acid (PFOS)	ND	25	23	0	0	35-150	0			S
Perfluorodecanesulfonic Acid (PFDS)	34.66	25	24	0	144	35-150	0			
Perfluorooctanesulfonamide (PFOSA)	27.02	25	25	0	108	35-150	0			
11Cl-Pf3OUdS	25.42	25	23.5	0	108	35-150	0			
4,8-Dioxa-3H-perfluorononanoic Acid (	22.3	25	23.5	0	94.9	35-150	0			J
9Cl-PF3ONS	22.81	25	23	0	99.2	35-150	0			J
Surr: 13C4-PFBA	*421.1*	0	*400*	0	*105*	*50-130*	0			
Surr: 13C5-PFPeA	*405.1*	0	*400*	0	*101*	*50-130*	0			
Surr: 13C2-PFHxA	*412.2*	0	*400*	0	*103*	*50-130*	0			
Surr: 13C4-PFHpA	*388*	0	*400*	0	*97*	*50-130*	0			
Surr: 13C4-PFOA	*439.3*	0	*400*	0	*110*	*70-130*	0			
Surr: 13C5-PFNA	*407.9*	0	*400*	0	*102*	*70-130*	0			
Surr: 13C2-PFDA	*417.3*	0	*400*	0	*104*	*70-130*	0			
Surr: 13C2-PFUnA	*433.7*	0	*400*	0	*108*	*70-130*	0			
Surr: 13C2-PFDoA	*429.6*	0	*400*	0	*107*	*70-130*	0			
Surr: 13C2-PFTeA	*370.1*	0	*400*	0	*92.5*	*50-130*	0			
Surr: 13C3-PFBS	*383.1*	0	*400*	0	*95.8*	*50-130*	0			
Surr: 18O2-PFHxS	*390.2*	0	*378*	0	*103*	*70-130*	0			
Surr: 13C4-PFOS	*372.5*	0	*383*	0	*97.3*	*70-130*	0			
Surr: 13C2-FtS 4:2	*271.9*	0	*373*	0	*72.9*	*50-130*	0			
Surr: 13C2-FtS 6:2	*357.4*	0	*380*	0	*94.1*	*50-130*	0			
Surr: 13C2-FtS 8:2	*304*	0	*383*	0	*79.4*	*50-130*	0			
Surr: 13C8-FOSA	*419.4*	0	*400*	0	*105*	*50-130*	0			
Surr: d3-N-MeFOSAA	*408.7*	0	*400*	0	*102*	*50-130*	0			
Surr: d5-N-EtFOSAA	*495.9*	0	*400*	0	*124*	*50-130*	0			
Surr: 13C3-HFPO-DA	*391.9*	0	*400*	0	*98*	*50-130*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: City of Escanaba WWTP
Work Order: 21080360
Project: Sludge Analyses

QC BATCH REPORT

Batch ID: **181498** Instrument ID **LCMS1** Method: **D7968-17a**

LCS2	Sample ID: **LCS2-181498-181498**				Units: **ng/Kg**			Analysis Date: **8/5/2021 06:42 PM**			
Client ID:		Run ID: **LCMS1_210805B**			SeqNo: **7646503**			Prep Date: **8/5/2021**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Perfluorobutanoic Acid (PFBA)	491.9	120	500	0	98.4	50-130	0			
Perfluoropentanoic Acid (PFPeA)	482.8	120	500	0	96.6	70-130	0			
Perfluorohexanoic Acid (PFHxA)	448.9	120	500	0	89.8	50-130	0			
Perfluoroheptanoic Acid (PFHpA)	455	120	500	0	91	50-130	0			
Perfluorooctanoic Acid (PFOA)	514.9	25	500	0	103	70-130	0			
Perfluorodecanoic Acid (PFDA)	519.9	120	500	0	104	70-130	0			
Perfluoroundecanoic Acid (PFUnA)	524.1	120	500	0	105	70-130	0			
Perfluorododecanoic Acid (PFDoA)	532.5	120	500	0	107	70-130	0			
Perfluorotridecanoic Acid (PFTriA)	527.9	120	500	0	106	70-130	0			
Perfluorotetradecanoic Acid (PFTeA)	498.3	120	500	0	99.7	70-130	0			
Perfluorobutanesulfonic Acid (PFBS)	391.8	25	442	0	88.6	70-130	0			
Perfluoropentanesulfonic Acid (PFPeS	470.5	25	469	0	100	70-130	0			
Perfluorohexanesulfonic Acid (PFHxS)	428.5	120	455	0	94.2	70-130	0			
Perfluoroheptanesulfonic Acid (PFHpS	472.1	120	476	0	99.2	70-130	0			
Perfluorooctanesulfonic Acid (PFOS)	459.3	25	464	0	99	70-130	0			
Perfluorononanesulfonic Acid (PFNS)	447.3	120	480	0	93.2	70-130	0			
Perfluorodecanesulfonic Acid (PFDS)	441.4	25	482	0	91.6	70-130	0			
Fluorotelomer Sulphonic Acid 4:2 (FtS	416.1	120	467	0	89.1	70-130	0			
Fluorotelomer Sulphonic Acid 6:2 (FtS	464.4	120	474	0	98	70-130	0			
Fluorotelomer Sulphonic Acid 8:2 (FtS	457.8	120	479	0	95.6	70-130	0			
Perfluorooctanesulfonamide (PFOSA)	502.9	25	500	0	101	70-130	0			
N-Ethylperfluorooctanesulfonamidoace	622	120	500	0	124	70-130	0			
N-Methylperfluorooctanesulfonamidoa	519.1	120	500	0	104	70-130	0			
11Cl-Pf3OUdS	483.3	25	471	0	103	70-130	0			
4,8-Dioxa-3H-perfluorononanoic Acid (	480.9	25	471	0	102	70-130	0			
9Cl-PF3ONS	430.7	25	466	0	92.4	70-130	0			
Hexafluoropropylene oxide dimer acid	471.3	120	500	0	94.3	50-130	0			
Surr: 13C4-PFBA	*396.7*	0	*400*	0	*99.2*	*50-130*	0			
Surr: 13C5-PFPeA	*383.7*	0	*400*	0	*95.9*	*50-130*	0			
Surr: 13C2-PFHxA	*398.4*	0	*400*	0	*99.6*	*50-130*	0			
Surr: 13C4-PFHpA	*356.1*	0	*400*	0	*89*	*50-130*	0			
Surr: 13C4-PFOA	*433.4*	0	*400*	0	*108*	*70-130*	0			
Surr: 13C5-PFNA	*410.9*	0	*400*	0	*103*	*70-130*	0			
Surr: 13C2-PFDA	*385.6*	0	*400*	0	*96.4*	*70-130*	0			
Surr: 13C2-PFUnA	*396.5*	0	*400*	0	*99.1*	*70-130*	0			
Surr: 13C2-PFDoA	*401.7*	0	*400*	0	*100*	*70-130*	0			
Surr: 13C2-PFTeA	*356.5*	0	*400*	0	*89.1*	*50-130*	0			
Surr: 13C3-PFBS	*372.5*	0	*400*	0	*93.1*	*50-130*	0			
Surr: 18O2-PFHxS	*349.2*	0	*378*	0	*92.4*	*70-130*	0			
Surr: 13C4-PFOS	*338.2*	0	*383*	0	*88.3*	*70-130*	0			
Surr: 13C2-FtS 4:2	*289.7*	0	*373*	0	*77.7*	*50-130*	0			
Surr: 13C2-FtS 6:2	*350.9*	0	*380*	0	*92.3*	*50-130*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC BATCH REPORT

Batch ID: **181498** Instrument ID **LCMS1** Method: **D7968-17a**

Surr: 13C2-FtS 8:2	*298.1*	0	*383*	0	*77.8*	*50-130*	0
Surr: 13C8-FOSA	*378.7*	0	*400*	0	*94.7*	*50-130*	0
Surr: d3-N-MeFOSAA	*387.8*	0	*400*	0	*97*	*50-130*	0
Surr: d5-N-EtFOSAA	*488.1*	0	*400*	0	*122*	*50-130*	0
Surr: 13C3-HFPO-DA	*377.7*	0	*400*	0	*94.4*	*50-130*	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: City of Escanaba WWTP
Work Order: 21080360
Project: Sludge Analyses

QC BATCH REPORT

Batch ID: **181498** Instrument ID **LCMS1** Method: **D7968-17a**

LCS3	Sample ID: **LCS3-181498-181498**				Units: **ng/Kg**		Analysis Date: **8/5/2021 06:31 PM**			
Client ID:		Run ID: **LCMS1_210805B**			SeqNo: **7646502**		Prep Date: **8/5/2021**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Perfluorobutanoic Acid (PFBA)	146.3	120	125	0	117	35-150	0			
Perfluoropentanoic Acid (PFPeA)	126.5	120	125	0	101	35-150	0			
Perfluorohexanoic Acid (PFHxA)	113.2	120	125	0	90.6	35-150	0			J
Perfluoroheptanoic Acid (PFHpA)	134.6	120	125	0	108	35-150	0			
Perfluorooctanoic Acid (PFOA)	132.6	25	125	0	106	35-150	0			
Perfluorodecanoic Acid (PFDA)	136	120	125	0	109	35-150	0			
Perfluoroundecanoic Acid (PFUnA)	147.9	120	125	0	118	35-150	0			
Perfluorododecanoic Acid (PFDoA)	138.5	120	125	0	111	35-150	0			
Perfluorotridecanoic Acid (PFTriA)	144.8	120	125	0	116	35-150	0			
Perfluorotetradecanoic Acid (PFTeA)	143.6	120	125	0	115	35-150	0			
Perfluorobutanesulfonic Acid (PFBS)	106.8	25	110	0	97.1	35-150	0			
Perfluoropentanesulfonic Acid (PFPeS	127.3	25	118	0	108	35-150	0			
Perfluorohexanesulfonic Acid (PFHxS)	105.2	120	115	0	91.5	35-150	0			J
Perfluoroheptanesulfonic Acid (PFHpS	124.5	120	120	0	104	35-150	0			
Perfluorooctanesulfonic Acid (PFOS)	100.3	25	115	0	87.2	35-150	0			
Perfluorononanesulfonic Acid (PFNS)	122.9	120	120	0	102	35-150	0			
Perfluorodecanesulfonic Acid (PFDS)	143.1	25	120	0	119	35-150	0			
Fluorotelomer Sulphonic Acid 4:2 (FtS	119.6	120	118	0	101	35-150	0			J
Fluorotelomer Sulphonic Acid 6:2 (FtS	111.5	120	118	0	94.5	35-150	0			J
Fluorotelomer Sulphonic Acid 8:2 (FtS	93.74	120	120	0	78.1	35-150	0			J
Perfluorooctanesulfonamide (PFOSA)	137.6	25	125	0	110	35-150	0			
N-Ethylperfluorooctanesulfonamidoace	145.6	120	125	0	116	35-150	0			
N-Methylperfluorooctanesulfonamidoa	82.67	120	125	0	66.1	35-150	0			J
11Cl-Pf3OUdS	147.5	25	118	0	125	35-150	0			
4,8-Dioxa-3H-perfluorononanoic Acid (	129.2	25	118	0	110	35-150	0			
9Cl-PF3ONS	116.9	25	118	0	99.1	35-150	0			
Hexafluoropropylene oxide dimer acid	116.2	120	125	0	92.9	35-150	0			J
Surr: 13C4-PFBA	*405.9*	0	*400*	0	*101*	*50-130*	0			
Surr: 13C5-PFPeA	*396*	0	*400*	0	*99*	*50-130*	0			
Surr: 13C2-PFHxA	*387.1*	0	*400*	0	*96.8*	*50-130*	0			
Surr: 13C4-PFHpA	*403*	0	*400*	0	*101*	*50-130*	0			
Surr: 13C4-PFOA	*432.7*	0	*400*	0	*108*	*70-130*	0			
Surr: 13C5-PFNA	*419.5*	0	*400*	0	*105*	*70-130*	0			
Surr: 13C2-PFDA	*398.4*	0	*400*	0	*99.6*	*70-130*	0			
Surr: 13C2-PFUnA	*403.9*	0	*400*	0	*101*	*70-130*	0			
Surr: 13C2-PFDoA	*406.7*	0	*400*	0	*102*	*70-130*	0			
Surr: 13C2-PFTeA	*337.9*	0	*400*	0	*84.5*	*50-130*	0			
Surr: 13C3-PFBS	*377.1*	0	*400*	0	*94.3*	*50-130*	0			
Surr: 18O2-PFHxS	*383.2*	0	*378*	0	*101*	*70-130*	0			
Surr: 13C4-PFOS	*380.3*	0	*383*	0	*99.3*	*70-130*	0			
Surr: 13C2-FtS 4:2	*281.1*	0	*373*	0	*75.4*	*50-130*	0			
Surr: 13C2-FtS 6:2	*341.9*	0	*380*	0	*90*	*50-130*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: City of Escanaba WWTP
Work Order: 21080360
Project: Sludge Analyses

QC BATCH REPORT

Batch ID: **181498**	Instrument ID **LCMS1**		Method: **D7968-17a**				
Surr: 13C2-FtS 8:2	*273.5*	0	*383*	0	*71.4*	*50-130*	0
Surr: 13C8-FOSA	*406.8*	0	*400*	0	*102*	*50-130*	0
Surr: d3-N-MeFOSAA	*417.9*	0	*400*	0	*104*	*50-130*	0
Surr: d5-N-EtFOSAA	*453.6*	0	*400*	0	*113*	*50-130*	0
Surr: 13C3-HFPO-DA	*350.1*	0	*400*	0	*87.5*	*50-130*	0

The following samples were analyzed in this batch: 21080360-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: City of Escanaba WWTP
Work Order: 21080360
Project: Sludge Analyses

QC BATCH REPORT

Batch ID: **181554** Instrument ID **LCMS1** Method: **D7968-17a**

MBLK1 Sample ID: **MBLK1-181554-181554** Units: **ng/Kg** Analysis Date: **8/6/2021 02:30 PM**
Client ID: Run ID: **LCMS1_210806B** SeqNo: **7648890** Prep Date: **8/6/2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Perfluorononanoic Acid (PFNA)	ND	25	0	0	0		0			
Surr: 13C5-PFNA	*452.1*	0	*400*	0	*113*	*70-130*	0			

MBLK2 Sample ID: **MBLK2-181554-181554** Units: **ng/Kg** Analysis Date: **8/6/2021 03:12 PM**
Client ID: Run ID: **LCMS1_210806B** SeqNo: **7648894** Prep Date: **8/6/2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Perfluorononanoic Acid (PFNA)	ND	25	0	0	0		0			
Surr: 13C5-PFNA	*451*	0	*400*	0	*113*	*70-130*	0			

MS Sample ID: **21080175-03A MS** Units: **ng/Kg** Analysis Date: **8/6/2021 03:22 PM**
Client ID: Run ID: **LCMS1_210806B** SeqNo: **7648895** Prep Date: **8/6/2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Perfluorononanoic Acid (PFNA)	522.3	25	500	1.424	104	70-130	0			
Surr: 13C5-PFNA	*424.5*	0	*400*	0	*106*	*70-130*	0			

DUP Sample ID: **21080175-02A DUP** Units: **ng/Kg** Analysis Date: **8/6/2021 03:53 PM**
Client ID: Run ID: **LCMS1_210806B** SeqNo: **7648898** Prep Date: **8/6/2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Perfluorononanoic Acid (PFNA)	23.48	25	0	0	0		17.93	0	30	J
Surr: 13C5-PFNA	*424.9*	0	*396*	0	*107*	*70-130*	432	*1.65*	*30*	

LCS1 Sample ID: **LCS1-181554-181554** Units: **ng/Kg** Analysis Date: **8/6/2021 02:40 PM**
Client ID: Run ID: **LCMS1_210806B** SeqNo: **7648891** Prep Date: **8/6/2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Perfluorononanoic Acid (PFNA)	25.02	25	25	0	100	35-150	0			
Surr: 13C5-PFNA	*432*	0	*400*	0	*108*	*70-130*	0			

LCS2 Sample ID: **LCS2-181554-181554** Units: **ng/Kg** Analysis Date: **8/6/2021 03:01 PM**
Client ID: Run ID: **LCMS1_210806B** SeqNo: **7648893** Prep Date: **8/6/2021** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Perfluorononanoic Acid (PFNA)	552.9	25	500	0	111	70-130	0			
Surr: 13C5-PFNA	*458.1*	0	*400*	0	*115*	*70-130*	0			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: City of Escanaba WWTP
Work Order: 21080360
Project: Sludge Analyses

QC BATCH REPORT

Batch ID: **181554** Instrument ID **LCMS1** Method: **D7968-17a**

LCS3	Sample ID: **LCS3-181554-181554**				Units: **ng/Kg**		Analysis Date: **8/6/2021 02:51 PM**			
Client ID:		Run ID: **LCMS1_210806B**			SeqNo: **7648892**		Prep Date: **8/6/2021**		DF: **1**	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Perfluorononanoic Acid (PFNA)	124.2	25	125	0	99.3	35-150	0			
Surr: 13C5-PFNA	*461.3*	0	*400*	0	*115*	*70-130*	0			

The following samples were analyzed in this batch: 21080360-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: City of Escanaba WWTP
Work Order: 21080360
Project: Sludge Analyses

QC BATCH REPORT

Batch ID: **R323997** Instrument ID **MOIST** Method: **SW3550C**

MBLK Sample ID: **WBLKS-R323997** Units: **% of sample** Analysis Date: **8/9/2021 10:50 AM**
Client ID: Run ID: **MOIST_210809A** SeqNo: **7650614** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	ND	0.10								

LCS Sample ID: **LCS-R323997** Units: **% of sample** Analysis Date: **8/9/2021 10:50 AM**
Client ID: Run ID: **MOIST_210809A** SeqNo: **7650613** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	99.98	0.10	100	0	100	98-102	0			

DUP Sample ID: **21080200-01A DUP** Units: **% of sample** Analysis Date: **8/9/2021 10:50 AM**
Client ID: Run ID: **MOIST_210809A** SeqNo: **7650596** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	10.55	0.10	0	0	0	0-0	10.23	3.08	10	

DUP Sample ID: **21080510-02A DUP** Units: **% of sample** Analysis Date: **8/9/2021 10:50 AM**
Client ID: Run ID: **MOIST_210809A** SeqNo: **7650607** Prep Date: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Moisture	75.32	0.10	0	0	0	0-0	76.01	0.912	10	

The following samples were analyzed in this batch: 21080360-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Cincinnati, OH +1 513 733 5336
Fort Collins, CO +1 970 490 1511
Everett, WA +1 425 356 2600
Holland, MI +1 616 399 6070
Houston, TX +1 281 530 5656
Spring City, PA +1 610 948 4903
South Charleston, WV +1 304 356 3168
Middletown, PA +1 717 944 5541
Salt Lake City, UT +1 801 266 7700
York, PA +1 717 505 5280

Chain of Custody Form

Page ____ of ____

COC ID: 230596

ALS Project Manager: | ALS Work Order #: 21080360

Customer Information		Project Information		Parameter/Method Request for Analysis	
Purchase Order		Project Name		A	PFAS
Work Order		Project Number		B	
Company Name	City of Escanaba WWTP	Bill To Company	City of Escanaba WWTP	C	
Send Report To	Jeff Lampi	Invoice Attn	Jeff Lampi	D	
Address	P.O. Box 948	Address	P.O. Box 948	E	
				F	
City/State/Zip	Escanaba, MI 49829	City/State/Zip	Escanaba, MI 49829	G	
Phone	(906) 786-1301	Phone	(906) 786-1301	H	
Fax	(906) 789-3600	Fax	(906) 789-3600	I	
e-Mail Address		e-Mail Address		J	

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	TANK #5 Biosolids	8/3/21	10:30AM	Sludge	NA	1	X										
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign: Chris Barron Chris Barron

Shipment Method: UPS

Required Turnaround Time: (Check Box) ☐ Std 10 WK Days ☐ 5 WK Days ☐ Other ☐ 2 WK Days ☐ 24 Hour

Results Due Date:

Relinquished by:	Date:	Time:	Received by:
Chris Barron	8/3/21	11AM	UPS
Relinquished by: UPS	Date: 8/4/21	Time: 1030	Received by (Laboratory):
Logged by (Laboratory):	Date: 8/5/21	Time: 1123	Checked by (Laboratory):

Notes:

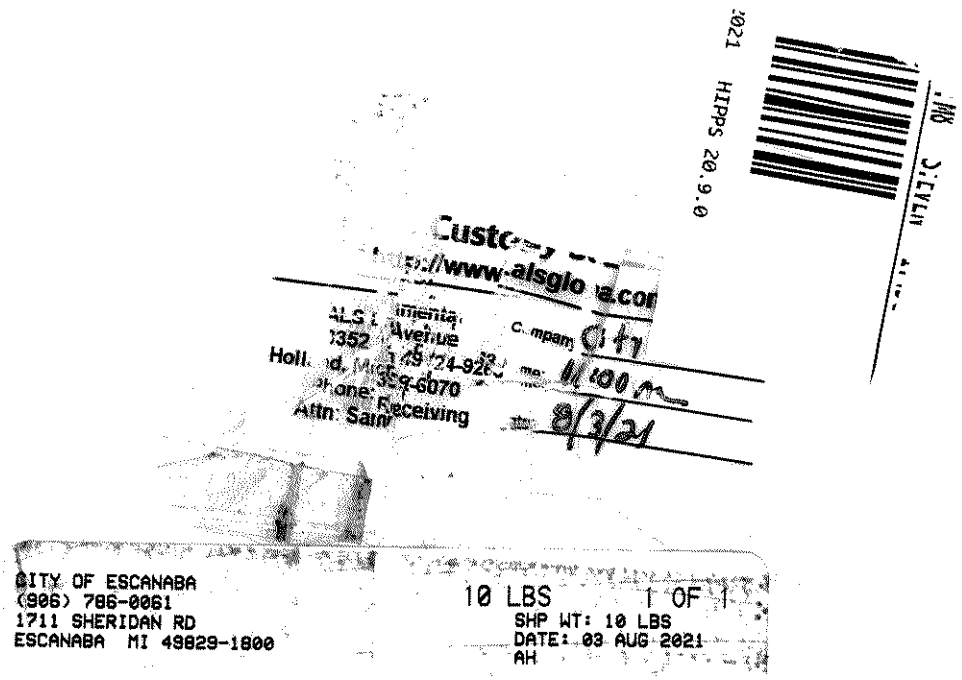
Cooler ID	Cooler Temp.
IR1	2.6°C

QC Package: (Check One Box Below)
- ☑ Level II Std QC
- ☐ Level III Std QC/Raw Data
- ☐ Level IV SW846/CLP
- ☐ Other
- ☐ TRRP CheckList
- ☐ TRRP Level IV

Preservative Key: 1-HCl 2-HNO_3 3-H_2SO_4 4-NaOH 5-$Na_2S_2O_3$ 6-$NaHSO_4$ 7-Other 8-4°C 9-5035

Note:
1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.
2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.
3. The Chain of Custody is a legal document. All information must be completed accurately.

Copyright 2011 by ALS Environmental.


Custc
http://www.alsglo
ALS
3352
Holl
Phone: Receiving
Attn: Sam
8/3/21
CITY OF ESCANABA
(906) 786-0061
1711 SHERIDAN RD
ESCANABA MI 49829-1800
10 LBS 1 OF 1
SHP WT: 10 LBS
DATE: 03 AUG 2021
AH
SHIP ALS GROUP USA, CORP
TO: 3352 128TH AVE
HOLLAND MI 49424-9263
MI 495 9-04
UPS NEXT DAY AIR
TRACKING #: 1Z 746 W68 01 7566 3750
1
BILLING: P/P
ISH 13.00F ZZP 450 48.5U 07/20

ALS Group, USA

Sample Receipt Checklist

Client Name: **ESCWWTP** Date/Time Received: **04-Aug-21 10:30**

Work Order: **21080360** Received by: **LYS**

Checklist completed by Lydia Sweet (eSignature) 05-Aug-21 (Date) Reviewed by: Bill Carey (eSignature) 06-Aug-21 (Date)

Matrices: Sludge

Carrier name: UPS

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Sample(s) received on ice?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.6/2.6c	IR1	
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	8/5/2021 11:28:10 AM		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:	-		

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

CorrectiveAction: