Memo

SUBJECT
RACER Buick City Sanitary PFAS Update

TO
Grant Trigger, RACER Trust

DATE
August 22, 2022,

PROJECT NUMBER
30075935

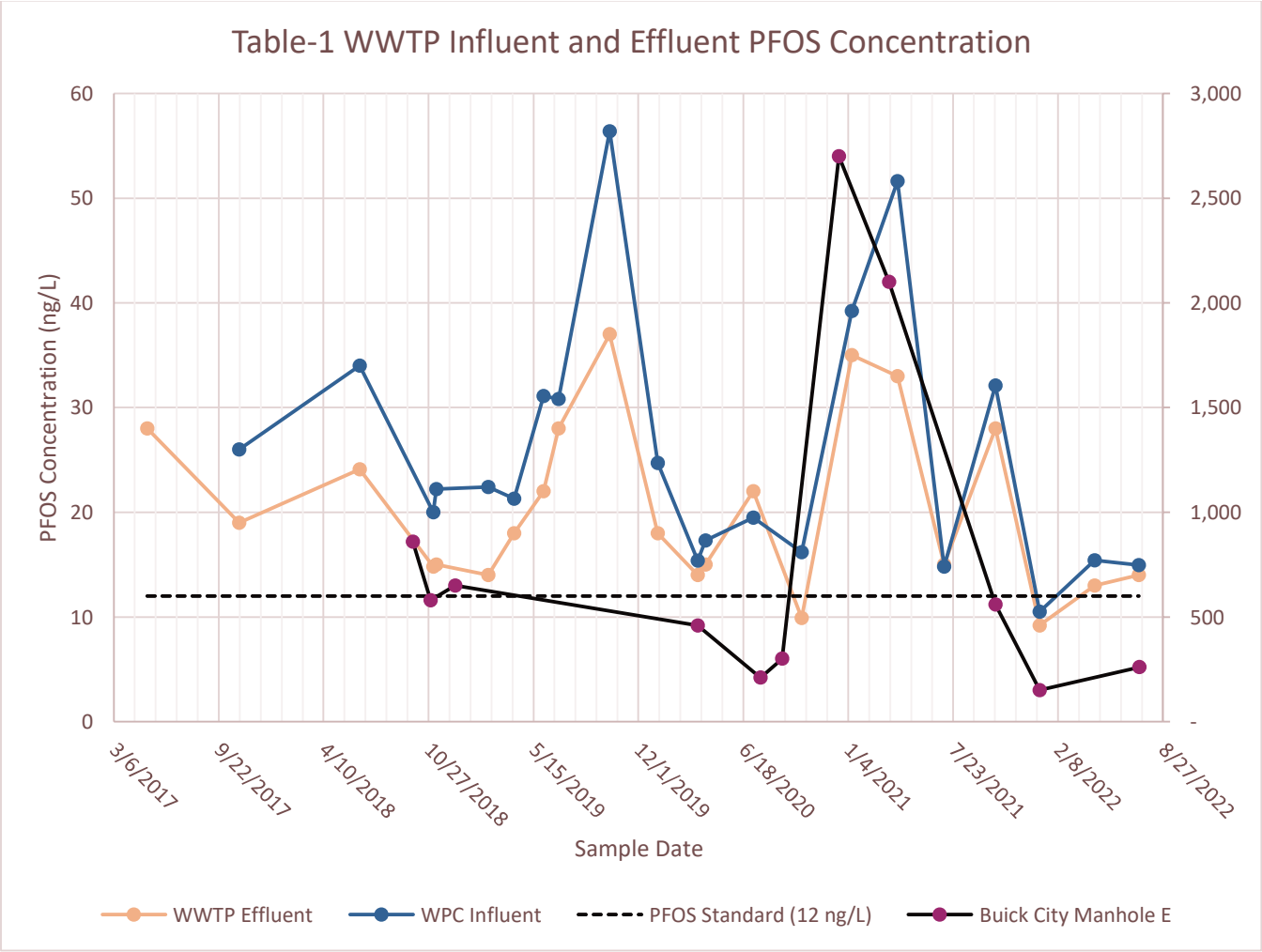
COPIES TO
Chris Peters, Arcadis
Micki Maki, Arcadis

NAME
Tony Maffeo

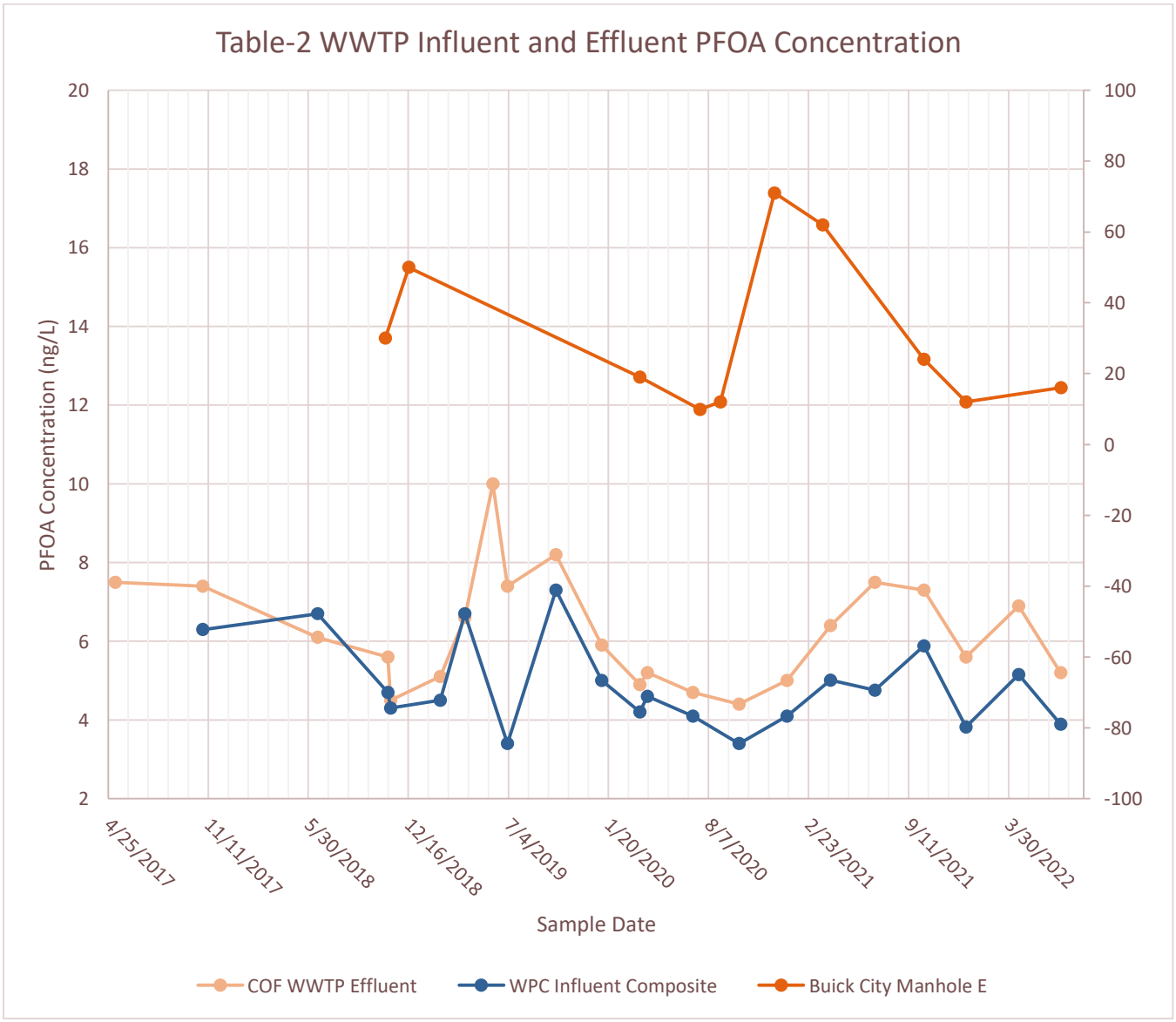
This memo summarizes the recent activities related to the Hamilton Avenue sanitary sewer at the RACER Buick City Site (Site) located in Flint, Michigan. Based on previous communications, the temporary plugging of portions of the sanitary sewer were beneficial and permanent plugs were placed at the upgradient line of Manhole H-1A and down gradient at Manhole H-1 on December 8, 2021. Additionally, the line between the two manholes was filled with grout to eliminate infiltration into the sewer between the two plugs and to prevent migration across Hamilton Avenue through the laterals. Two samples were collected from the sanitary sewer (Manhole MH E and MH E-1) on July 13th of 2022 are shown in the analytical report.

Trend curves (displayed below) were also prepared to evaluate the relationship between the PFOS and PFOA levels in the Hamilton Avenue sanitary sewer and levels of PFOS and PFOA received at the City of Flint WWTP. Based on data available it appears that the bulkheading has a significant impact on both the Hamilton Avenue locations and the City of Flint's sampling locations. An increase of PFOS and PFOA concentration was noticed in MH E, PFOS concentration in City of Flints WWTP effluent increased as well, PFOS in the WPC influent composite decreased. Increased PFOA concentration was noticed in MH E but didn't correlate to an increases of PFOA concentration at the City of Flints WWTP effluent or the WPC influent composite.

RACER will continue collecting samples quarterly to monitor detections.



Note: Data from Buick City Manhole E is scaled on the right Y-axis



Note: Data from Buick City Manhole E is scaled on the right Y-axis

Attachment A
Analytical Reports

Analytical Laboratory Report

Report ID: S38065.01(01)
Generated on 07/28/2022

Report to

Attention: Erin Kozak
Arcadis US, Inc.
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O: 810-225-1901 FAX:
Email: erin.kozak@arcadis.com

Addtional Contacts: Megan Humphrey, Deb Newcom, Joey Barker

Report produced by

Merit Laboratories, Inc.
2680 East Lansing Drive
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:
John Laverty (johnlaverty@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S38065.01-S38065.02
Project: 30121887.03200 Racer Buick City
Collected Date(s): 07/13/2022
Submitted Date/Time: 07/13/2022 15:00
Sampled by: Donald Richmond
P.O. #: 30121887.03200

Table of Contents

Maya Murshak
Technical Director

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).
When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.
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, and 2-chloroethylvinyl ether 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.
Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

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
Wisconsin DNR	FID# 399147320

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
ASTMD7979-19M	ASTM Method D7979 - 19 Modified (Isotopic Dilution)

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

Sample Summary (2 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S38065.01	MHE_071322	Wastewater	07/13/22 08:40
S38065.02	MHE-1_071322	Wastewater	07/13/22 08:45

Merit Laboratories, Inc.

Analytical Laboratory Report

Lab Sample ID: S38065.01
Sample Tag: MHE_071322
Collected Date/Time: 07/13/2022 08:40
Matrix: Wastewater
COC Reference: 148859

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.6	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.41/6.95/11	ASTMD7979-19M	07/25/22 15:30	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 07/25/22 21:03, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	20		ng/L	2.01	375-22-4	X
PFPeA*	8.0	4.0		ng/L	2.01	2706-90-3	
4:2 FTSA*	Not detected	2.0		ng/L	2.01	757124-72-4	
PFHxA*	19	2.0		ng/L	2.01	307-24-4	
PFBS*	21	2.0		ng/L	2.01	375-73-5	
PFHpA*	7.4	2.0		ng/L	2.01	375-85-9	
PFPeS*	23	2.0		ng/L	2.01	2706-91-4	
6:2 FTSA*	Not detected	2.0		ng/L	2.01	27619-97-2	
PFOA*	16	2.0		ng/L	2.01	335-67-1	
PFHxS*	160	2.0		ng/L	2.01	355-46-4	
PFHxS-LN*	130	2.0		ng/L	2.01	355-46-4-LN	
PFHxS-BR*	26	2.0		ng/L	2.01	355-46-4-BR	
PFNA*	3.5	2.0		ng/L	2.01	375-95-1	
8:2 FTSA*	Not detected	2.0		ng/L	2.01	39108-34-4	
PFHpS*	5.9	2.0		ng/L	2.01	375-92-8	
PFDA*	Not detected	2.0		ng/L	2.01	335-76-2	
N-MeFOSAA*	Not detected	2.0		ng/L	2.01	2355-31-9	
EtFOSAA*	Not detected	4.0		ng/L	2.01	2991-50-6	
PFOS*	260	2.0		ng/L	2.01	1763-23-1	
PFOS-LN*	150	2.0		ng/L	2.01	1763-23-1-LN	
PFOS-BR*	110	2.0		ng/L	2.01	1763-23-1-BR	
PFUnDA*	Not detected	2.0		ng/L	2.01	2058-94-8	
PFNS*	Not detected	2.0		ng/L	2.01	68259-12-1	
PFDoDA*	Not detected	2.0		ng/L	2.01	307-55-1	
PFDS*	Not detected	2.0		ng/L	2.01	335-77-3	
PFTrDA*	Not detected	2.0		ng/L	2.01	72629-94-8	
FOSA*	Not detected	2.0		ng/L	2.01	754-91-6	
PFTeDA*	Not detected	4.0		ng/L	2.01	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0		ng/L	2.01	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0		ng/L	2.01	756426-58-1	
ADONA*	Not detected	2.0		ng/L	2.01	919005-14-4	
HFPO-DA*	Not detected	10		ng/L	2.01	13252-13-6	

X-Elevated reporting limit due to matrix interference

Merit Laboratories, Inc.

Analytical Laboratory Report

Lab Sample ID: S38065.02
Sample Tag: MHE-1_071322
Collected Date/Time: 07/13/2022 08:45
Matrix: Wastewater
COC Reference: 148859

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.6	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.27/6.89/11	ASTMD7979-19M	07/25/22 15:30	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 07/25/22 21:42, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	20		ng/L	2.04	375-22-4	X
PFPeA*	13	4.1		ng/L	2.04	2706-90-3	
4:2 FTSA*	Not detected	2.0		ng/L	2.04	757124-72-4	
PFHxA*	23	2.0		ng/L	2.04	307-24-4	
PFBS*	29	2.0		ng/L	2.04	375-73-5	
PFHpA*	7.7	2.0		ng/L	2.04	375-85-9	
PFPeS*	26	2.0		ng/L	2.04	2706-91-4	
6:2 FTSA*	Not detected	2.0		ng/L	2.04	27619-97-2	
PFOA*	19	2.0		ng/L	2.04	335-67-1	
PFHxS*	190	2.0		ng/L	2.04	355-46-4	
PFHxS-LN*	160	2.0		ng/L	2.04	355-46-4-LN	
PFHxS-BR*	29	2.0		ng/L	2.04	355-46-4-BR	
PFNA*	4.5	2.0		ng/L	2.04	375-95-1	
8:2 FTSA*	Not detected	2.0		ng/L	2.04	39108-34-4	
PFHpS*	6.9	2.0		ng/L	2.04	375-92-8	
PFDA*	Not detected	2.0		ng/L	2.04	335-76-2	
N-MeFOSAA*	Not detected	2.0		ng/L	2.04	2355-31-9	
EtFOSAA*	Not detected	4.1		ng/L	2.04	2991-50-6	
PFOS*	300	2.0		ng/L	2.04	1763-23-1	
PFOS-LN*	170	2.0		ng/L	2.04	1763-23-1-LN	
PFOS-BR*	130	2.0		ng/L	2.04	1763-23-1-BR	
PFUnDA*	Not detected	2.0		ng/L	2.04	2058-94-8	
PFNS*	Not detected	2.0		ng/L	2.04	68259-12-1	
PFDoDA*	Not detected	2.0		ng/L	2.04	307-55-1	
PFDS*	Not detected	2.0		ng/L	2.04	335-77-3	
PFTrDA*	Not detected	2.0		ng/L	2.04	72629-94-8	
FOSA*	Not detected	2.0		ng/L	2.04	754-91-6	
PFTeDA*	Not detected	4.1		ng/L	2.04	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0		ng/L	2.04	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0		ng/L	2.04	756426-58-1	
ADONA*	Not detected	2.0		ng/L	2.04	919005-14-4	
HFPO-DA*	Not detected	10		ng/L	2.04	13252-13-6	

X-Elevated reporting limit due to matrix interference

Merit Laboratories Login Checklist

Lab Set ID: S38065
Client: ARCADIS_NOVI (ARCADIS U.S., Inc.)
Project: 30121887.03200 Racer Buick City
Submitted: 07/13/2022 15:00 Login User: PFD

Attention: Erin Kozak
Address: Arcadis US, Inc.
28550 Cabot Drive
Suite 500
Novi, MI 48377

Phone: O: 810-225-1901 FAX:
Email: erin.kozak@arcadis.com

Selection				Description	Note
Sample Receiving					
01.	[X] Yes	[ ] No	[ ] N/A	Samples are received at 4C +/- 2C Thermometer #	IR 4.6
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: _____

Merit Laboratories, Inc.

2680 East Lansing Dr., East Lansing, MI 48823
Phone (517) 332-0167 Fax (517) 332-4034
www.meritlabs.com

C.O.C. PAGE # 1 OF 1

148859

CHAIN OF CUSTODY RECORD

REPORT TO

CONTACT NAME: Joey Barker
COMPANY: Arcadis
ADDRESS: 28550 Cabot Dr Suite 500
CITY: Novi | STATE: MI | ZIP CODE: 48377
PHONE NO.: 248 790 5218 | CELL NO. | P.O. NO.
E-MAIL ADDRESS: Joey.Barker@arcadis.com | QUOTE NO.

INVOICE TO

CONTACT NAME | ☑ SAME
COMPANY
ADDRESS
CITY | STATE | ZIP CODE
PHONE NO. | E-MAIL ADDRESS

PROJECT NO./NAME: 30171887.03200 / Buick City
SAMPLER(S) - PLEASE PRINT/SIGN NAME: Donald Richmond /

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

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

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

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications
☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations
☐ Detroit ☐ New York
☐ Other _____

Special Instructions

MERIT LAB NO. (FOR LAB USE ONLY)	COLLECTION DATE	COLLECTION TIME	SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives: NONE	HCl	HNO_3	H_2SO_4	NaOH	MeOH	OTHER	PFAS
38065.01	7/13/22	0840	MHE_071322	WW	3	X							X
.02	7/13/22	0845	MHE-1_071322	WW	3	X							X

RELINQUISHED BY: SIGNATURE/ORGANIZATION: Arcadis ☑ Sampler | DATE: 7/13/22 | TIME: 1500
RECEIVED BY: SIGNATURE/ORGANIZATION: Patrick M | DATE: 7/13/22 | TIME: 1500
RELINQUISHED BY: SIGNATURE/ORGANIZATION | DATE | TIME
RECEIVED BY: SIGNATURE/ORGANIZATION | DATE | TIME

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 4.6

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

Rev. 1.26.22

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins Michigan
10448 Citation Drive
Suite 200
Brighton, MI 48116
Tel: (810)229-2763

Laboratory Job ID: 190-29193-1
Client Project/Site: Biosolids Cake 2022-07-14-E

For:
City of Flint
PO BOX 246
Flint, Michigan 48501-4246

Attn: Eric Brubaker

Sue Schafer

Authorized for release by:
8/9/2022 4:02:42 PM

Sue Schafer, Project Manager II
(810)229-2763
Sue.Schafer@et.eurofinsus.com

Table of Contents

Sample Summary

Client: City of Flint
Project/Site: Biosolids Cake 2022-07-14-E

Job ID: 190-29193-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
190-29193-1	COF WPCF Centrifuge	Solid	07/12/22 10:08	07/14/22 15:28

Job ID: 190-29193-1

Laboratory: Eurofins Michigan

Narrative

Job Narrative
190-29193-1

Comments
No additional comments.

Receipt
The sample was received on 7/14/2022 3:28 PM. 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 5.5º C.

LCMS
Method 537 (modified): The matrix spike / matrix spike duplicate (MS/MSD) recoveries for preparation batch 320-604445 and analytical batch 320-604880 were outside control limits. Sample matrix interference and/or non-homogeneity are suspected because the associated laboratory control sample (LCS) recovery was within acceptance limits.

Method 537 (modified): The "I" qualifier means the transition mass ratio for the indicated analyte was above 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. COF WPCF Centrifuge (190-29193-1)

Method 537 (modified): Due to the high concentration of Perfluoropentanoic acid (PFPeA), Perfluorohexanoic acid (PFHxA), Perfluoroheptanoic acid (PFHpA) and 6:2 FTS, the matrix spike / matrix spike duplicate (MS/MSD) for preparation batch 320-604445 and analytical batch 320-604880 could not be evaluated for accuracy and precision. The associated laboratory control sample (LCS) met acceptance criteria.

Method 537 (modified): The transition mass ratio was outside of the established ratio limit for 4:2 FTS in (CCVL 320-604875/2) associated to this data set. This is indicated by the "R" flag in the raw data. As the flagged data is in control in the CCVL, there is no adverse impact to the data. (CCVL 320-604875/2)

Method 537 (modified): The Isotope Dilution Analyte (IDA) recoveries of 13C4 PFBA and 13C5 PFPeA associated with the following sample is significantly below the method recommended limit: COF WPCF Centrifuge (190-29193-1). 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. The sample was re-extracted outside holding time with recurring results; therefore, the data have been reported.

Method 537 (modified): The "I" qualifier means the transition mass ratio for the indicated analyte was below the established ratio limits. The qualitative identification of the analyte has some degree of uncertainty. However, analyst judgment was used to positively identify the analyte: COF WPCF Centrifuge (190-29193-1).

Method 537 (modified): The concentration of one or more analytes associated with the following samples exceeded the instrument calibration range: (320-90058-A-12-A), (320-90058-A-12-B MS) and (320-90058-A-12-C MSD). These analytes have been qualified; however, the peaks did not saturate the instrument detector. Historical data indicate that for the isotope dilution method, dilution and re-analysis will not produce significantly different results from those reported above the calibration range.

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
Method SHAKE: Due to the matrix, the initial volumes used for the following samples deviated from the standard procedure: COF WPCF Centrifuge (190-29193-1). The reporting limits (RLs) have been adjusted proportionately.

PFC_IDA
Solid
preparation batch 320-604445

Job ID: 190-29193-1 (Continued)

Laboratory: Eurofins Michigan (Continued)

Method SHAKE: The following sample in preparation batch 320-604445 was yellow in color following extraction: COF WPCF Centrifuge (190-29193-1)

PFC_IDA
Solid
preparation batch 320-604445

Method SHAKE: The following sample in preparation batch 320-606548 was yellow in color following concentration. COF WPCF Centrifuge (190-29193-1)

320-606548
Method: PFC_IDA
Matrix: Solids

Method SHAKE: The following sample was re-prepared outside of preparation holding time due to low recoveries: COF WPCF Centrifuge (190-29193-1).

320-606548
Method: PFC_IDA
Matrix: Solids

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

Client: City of Flint
Project/Site: Biosolids Cake 2022-07-14-E

Job ID: 190-29193-1

Client Sample ID: COF WPCF Centrifuge
Date Collected: 07/12/22 10:08
Date Received: 07/14/22 15:28

Lab Sample ID: 190-29193-1
Matrix: Solid
Percent Solids: 34.6

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.558		2.86	0.558	ug/Kg	☼	07/20/22 19:01	07/22/22 17:57	1
F-53B Major	<0.501		2.86	0.501	ug/Kg	☼	07/20/22 19:01	07/22/22 17:57	1
F-53B Minor	<0.444		2.86	0.444	ug/Kg	☼	07/20/22 19:01	07/22/22 17:57	1
4:2 FTS	<0.730		2.86	0.730	ug/Kg	☼	07/20/22 19:01	07/22/22 17:57	1
6:2 FTS	**0.872**	**J**	2.86	0.387	ug/Kg	☼	07/20/22 19:01	07/22/22 17:57	1
8:2 FTS	<0.501		2.86	0.501	ug/Kg	☼	07/20/22 19:01	07/22/22 17:57	1
HFPO-DA (GenX)	<0.587		2.86	0.587	ug/Kg	☼	07/20/22 19:01	07/22/22 17:57	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	**5.94**		2.86	0.687	ug/Kg	☼	07/20/22 19:01	07/22/22 17:57	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	**4.83**		2.86	0.329	ug/Kg	☼	07/20/22 19:01	07/22/22 17:57	1
Perfluorobutanesulfonic acid (PFBS)	<0.544		2.86	0.544	ug/Kg	☼	07/20/22 19:01	07/22/22 17:57	1
Perfluorobutanoic acid (PFBA)	<0.659		2.86	0.659	ug/Kg	☼	07/20/22 19:01	07/22/22 17:57	1
Perfluorodecanesulfonic acid (PFDS)	<0.744		2.86	0.744	ug/Kg	☼	07/20/22 19:01	07/22/22 17:57	1
Perfluorodecanoic acid (PFDA)	**1.33**	**J**	2.86	0.687	ug/Kg	☼	07/20/22 19:01	07/22/22 17:57	1
Perfluorododecanoic acid (PFDoA)	**1.19**	**J**	2.86	0.429	ug/Kg	☼	07/20/22 19:01	07/22/22 17:57	1
Perfluoroheptanesulfonic acid (PFHpS)	<0.701		2.86	0.701	ug/Kg	☼	07/20/22 19:01	07/22/22 17:57	1
Perfluoroheptanoic acid (PFHpA)	<0.544		2.86	0.544	ug/Kg	☼	07/20/22 19:01	07/22/22 17:57	1
Perfluorohexanesulfonic acid (PFHxS)	<0.415		2.86	0.415	ug/Kg	☼	07/20/22 19:01	07/22/22 17:57	1
Perfluorohexanoic acid (PFHxA)	<0.444		2.86	0.444	ug/Kg	☼	07/20/22 19:01	07/22/22 17:57	1
Perfluorononanesulfonic acid (PFNS)	<0.415		2.86	0.415	ug/Kg	☼	07/20/22 19:01	07/22/22 17:57	1
Perfluorononanoic acid (PFNA)	<0.315		2.86	0.315	ug/Kg	☼	07/20/22 19:01	07/22/22 17:57	1
Perfluorooctanesulfonamide (FOSA)	**1.24**	**J**	2.86	0.472	ug/Kg	☼	07/20/22 19:01	07/22/22 17:57	1
Perfluorooctanesulfonic acid (PFOS)	**11.0**	**I**	2.86	0.616	ug/Kg	☼	07/20/22 19:01	07/22/22 17:57	1
Perfluorooctanoic acid (PFOA)	<0.759		2.86	0.759	ug/Kg	☼	07/20/22 19:01	07/22/22 17:57	1
Perfluoropentanesulfonic acid (PFPeS)	<0.530		2.86	0.530	ug/Kg	☼	07/20/22 19:01	07/22/22 17:57	1
Perfluoropentanoic acid (PFPeA)	**2.90**		2.86	0.587	ug/Kg	☼	07/20/22 19:01	07/22/22 17:57	1
Perfluorotetradecanoic acid (PFTeA)	**0.596**	**J I**	2.86	0.530	ug/Kg	☼	07/20/22 19:01	07/22/22 17:57	1
Perfluorotridecanoic acid (PFTriA)	**0.345**	**J**	2.86	0.301	ug/Kg	☼	07/20/22 19:01	07/22/22 17:57	1
Perfluoroundecanoic acid (PFUnA)	**1.32**	**J**	2.86	0.601	ug/Kg	☼	07/20/22 19:01	07/22/22 17:57	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*57*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:57*	*1*
13C3 HFPO-DA	*35*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:57*	*1*
13C4 PFBA	*0.8*	**5-*	*25 - 150*	*07/20/22 19:01*	*07/22/22 17:57*	*1*
13C3 PFBS	*47*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:57*	*1*
13C2 PFDA	*72*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:57*	*1*
13C2 PFDoA	*46*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:57*	*1*
13C4 PFHpA	*78*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:57*	*1*
13C2 PFHxA	*40*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:57*	*1*
13C5 PFNA	*86*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:57*	*1*
13C4 PFOA	*86*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:57*	*1*
13C4 PFOS	*73*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:57*	*1*
13C5 PFPeA	*4*	**5-*	*25 - 150*	*07/20/22 19:01*	*07/22/22 17:57*	*1*
13C2 PFTeDA	*31*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:57*	*1*

Client: City of Flint
Project/Site: Biosolids Cake 2022-07-14-E

Job ID: 190-29193-1

Client Sample ID: COF WPCF Centrifuge

Date Collected: 07/12/22 10:08
Date Received: 07/14/22 15:28

Lab Sample ID: 190-29193-1

Matrix: Solid
Percent Solids: 34.6

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

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C2 PFUnA	*69*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:57*	*1*
d5-NEtFOSAA	*49*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:57*	*1*
d3-NMeFOSAA	*50*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:57*	*1*
M2-4:2 FTS	*37*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:57*	*1*
M2-6:2 FTS	*144*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:57*	*1*
M2-8:2 FTS	*126*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:57*	*1*
18O2 PFHxS	*86*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:57*	*1*

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	**65.4**		0.1	0.1	%			07/15/22 15:36	1
Percent Solids	**34.6**		0.1	0.1	%			07/15/22 15:36	1

Client: City of Flint
Project/Site: Biosolids Cake 2022-07-14-E

Job ID: 190-29193-1

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-604445/1-A
Matrix: Solid
Analysis Batch: 604880

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 604445

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.0390		0.200	0.0390	ug/Kg		07/20/22 19:01	07/22/22 17:36	1
F-53B Major	<0.0350		0.200	0.0350	ug/Kg		07/20/22 19:01	07/22/22 17:36	1
F-53B Minor	<0.0310		0.200	0.0310	ug/Kg		07/20/22 19:01	07/22/22 17:36	1
4:2 FTS	<0.0510		0.200	0.0510	ug/Kg		07/20/22 19:01	07/22/22 17:36	1
6:2 FTS	<0.0270		0.200	0.0270	ug/Kg		07/20/22 19:01	07/22/22 17:36	1
8:2 FTS	<0.0350		0.200	0.0350	ug/Kg		07/20/22 19:01	07/22/22 17:36	1
HFPO-DA (GenX)	<0.0410		0.200	0.0410	ug/Kg		07/20/22 19:01	07/22/22 17:36	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<0.0480		0.200	0.0480	ug/Kg		07/20/22 19:01	07/22/22 17:36	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<0.0230		0.200	0.0230	ug/Kg		07/20/22 19:01	07/22/22 17:36	1
Perfluorobutanesulfonic acid (PFBS)	<0.0380		0.200	0.0380	ug/Kg		07/20/22 19:01	07/22/22 17:36	1
Perfluorobutanoic acid (PFBA)	<0.0460		0.200	0.0460	ug/Kg		07/20/22 19:01	07/22/22 17:36	1
Perfluorodecanesulfonic acid (PFDS)	<0.0520		0.200	0.0520	ug/Kg		07/20/22 19:01	07/22/22 17:36	1
Perfluorodecanoic acid (PFDA)	<0.0480		0.200	0.0480	ug/Kg		07/20/22 19:01	07/22/22 17:36	1
Perfluorododecanoic acid (PFDoA)	<0.0300		0.200	0.0300	ug/Kg		07/20/22 19:01	07/22/22 17:36	1
Perfluoroheptanesulfonic acid (PFHpS)	<0.0490		0.200	0.0490	ug/Kg		07/20/22 19:01	07/22/22 17:36	1
Perfluoroheptanoic acid (PFHpA)	<0.0380		0.200	0.0380	ug/Kg		07/20/22 19:01	07/22/22 17:36	1
Perfluorohexanesulfonic acid (PFHxS)	<0.0290		0.200	0.0290	ug/Kg		07/20/22 19:01	07/22/22 17:36	1
Perfluorohexanoic acid (PFHxA)	<0.0310		0.200	0.0310	ug/Kg		07/20/22 19:01	07/22/22 17:36	1
Perfluorononanesulfonic acid (PFNS)	<0.0290		0.200	0.0290	ug/Kg		07/20/22 19:01	07/22/22 17:36	1
Perfluorononanoic acid (PFNA)	<0.0220		0.200	0.0220	ug/Kg		07/20/22 19:01	07/22/22 17:36	1
Perfluorooctanesulfonamide (FOSA)	<0.0330		0.200	0.0330	ug/Kg		07/20/22 19:01	07/22/22 17:36	1
Perfluorooctanesulfonic acid (PFOS)	<0.0430		0.200	0.0430	ug/Kg		07/20/22 19:01	07/22/22 17:36	1
Perfluorooctanoic acid (PFOA)	<0.0530		0.200	0.0530	ug/Kg		07/20/22 19:01	07/22/22 17:36	1
Perfluoropentanesulfonic acid (PFPeS)	<0.0370		0.200	0.0370	ug/Kg		07/20/22 19:01	07/22/22 17:36	1
Perfluoropentanoic acid (PFPeA)	<0.0410		0.200	0.0410	ug/Kg		07/20/22 19:01	07/22/22 17:36	1
Perfluorotetradecanoic acid (PFTeA)	<0.0370		0.200	0.0370	ug/Kg		07/20/22 19:01	07/22/22 17:36	1
Perfluorotridecanoic acid (PFTriA)	<0.0210		0.200	0.0210	ug/Kg		07/20/22 19:01	07/22/22 17:36	1
Perfluoroundecanoic acid (PFUnA)	<0.0420		0.200	0.0420	ug/Kg		07/20/22 19:01	07/22/22 17:36	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*86*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:36*	*1*
13C3 HFPO-DA	*90*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:36*	*1*
13C4 PFBA	*48*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:36*	*1*
13C3 PFBS	*84*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:36*	*1*
13C2 PFDA	*91*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:36*	*1*
13C2 PFDoA	*87*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:36*	*1*
13C4 PFHpA	*92*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:36*	*1*
13C2 PFHxA	*85*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:36*	*1*
13C5 PFNA	*89*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:36*	*1*
13C4 PFOA	*88*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:36*	*1*
13C4 PFOS	*76*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:36*	*1*
13C5 PFPeA	*87*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:36*	*1*
13C2 PFTeDA	*83*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:36*	*1*
13C2 PFUnA	*94*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:36*	*1*
d5-NEtFOSAA	*84*		*25 - 150*	*07/20/22 19:01*	*07/22/22 17:36*	*1*

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

Lab Sample ID: MB 320-604445/1-A
Matrix: Solid
Analysis Batch: 604880

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 604445

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
d3-NMeFOSAA	85		25 - 150	07/20/22 19:01	07/22/22 17:36	1
M2-4:2 FTS	98		25 - 150	07/20/22 19:01	07/22/22 17:36	1
M2-6:2 FTS	96		25 - 150	07/20/22 19:01	07/22/22 17:36	1
M2-8:2 FTS	93		25 - 150	07/20/22 19:01	07/22/22 17:36	1
18O2 PFHxS	85		25 - 150	07/20/22 19:01	07/22/22 17:36	1

Lab Sample ID: LCS 320-604445/2-A
Matrix: Solid
Analysis Batch: 604880

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 604445

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	1.89	2.053		ug/Kg		109	79 - 139
F-53B Major	1.87	1.873		ug/Kg		100	74 - 134
F-53B Minor	1.89	1.662		ug/Kg		88	66 - 136
4:2 FTS	1.88	1.777		ug/Kg		95	68 - 143
6:2 FTS	1.90	1.724		ug/Kg		91	73 - 139
8:2 FTS	1.92	1.893		ug/Kg		99	75 - 135
HFPO-DA (GenX)	2.00	1.867		ug/Kg		93	53 - 158
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	2.00	1.939		ug/Kg		97	72 - 132
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	2.00	1.531		ug/Kg		77	72 - 132
Perfluorobutanesulfonic acid (PFBS)	1.78	1.604		ug/Kg		90	69 - 129
Perfluorobutanoic acid (PFBA)	2.00	1.952		ug/Kg		98	76 - 136
Perfluorodecanesulfonic acid (PFDS)	1.93	1.800		ug/Kg		93	71 - 131
Perfluorodecanoic acid (PFDA)	2.00	1.833		ug/Kg		92	72 - 132
Perfluorododecanoic acid (PFDoA)	2.00	1.842		ug/Kg		92	71 - 131
Perfluoroheptanesulfonic acid (PFHpS)	1.91	1.962		ug/Kg		103	76 - 136
Perfluoroheptanoic acid (PFHpA)	2.00	1.943		ug/Kg		97	71 - 131
Perfluorohexanesulfonic acid (PFHxS)	1.82	1.671		ug/Kg		92	62 - 122
Perfluorohexanoic acid (PFHxA)	2.00	1.833		ug/Kg		92	71 - 131
Perfluorononanesulfonic acid (PFNS)	1.92	1.986		ug/Kg		103	72 - 132
Perfluorononanoic acid (PFNA)	2.00	1.891		ug/Kg		95	73 - 133
Perfluorooctanesulfonamide (FOSA)	2.00	1.970		ug/Kg		99	77 - 137
Perfluorooctanesulfonic acid (PFOS)	1.86	1.878		ug/Kg		101	68 - 141
Perfluorooctanoic acid (PFOA)	2.00	1.937		ug/Kg		97	72 - 132
Perfluoropentanesulfonic acid (PFPeS)	1.88	1.868		ug/Kg		100	66 - 126
Perfluoropentanoic acid (PFPeA)	2.00	1.948		ug/Kg		97	69 - 129
Perfluorotetradecanoic acid (PFTeA)	2.00	1.819		ug/Kg		91	67 - 127
Perfluorotridecanoic acid (PFTriA)	2.00	1.865		ug/Kg		93	71 - 131

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

Lab Sample ID: LCS 320-604445/2-A
Matrix: Solid
Analysis Batch: 604880

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 604445

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Perfluoroundecanoic acid (PFUnA)			2.00	1.744		ug/Kg		87	66 - 126		

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C8 FOSA	*81*		*25 - 150*
13C3 HFPO-DA	*86*		*25 - 150*
13C4 PFBA	*45*		*25 - 150*
13C3 PFBS	*80*		*25 - 150*
13C2 PFDA	*87*		*25 - 150*
13C2 PFDoA	*87*		*25 - 150*
13C4 PFHpA	*91*		*25 - 150*
13C2 PFHxA	*83*		*25 - 150*
13C5 PFNA	*87*		*25 - 150*
13C4 PFOA	*89*		*25 - 150*
13C4 PFOS	*80*		*25 - 150*
13C5 PFPeA	*80*		*25 - 150*
13C2 PFTeDA	*81*		*25 - 150*
13C2 PFUnA	*92*		*25 - 150*
d5-NEtFOSAA	*79*		*25 - 150*
d3-NMeFOSAA	*79*		*25 - 150*
M2-4:2 FTS	*95*		*25 - 150*
M2-6:2 FTS	*99*		*25 - 150*
M2-8:2 FTS	*85*		*25 - 150*
18O2 PFHxS	*84*		*25 - 150*

Lab Sample ID: 320-90058-A-12-B MS
Matrix: Solid
Analysis Batch: 604880

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 604445

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.277		13.4	17.15		ug/Kg	☼	128	79 - 139		
F-53B Major	<0.249		13.3	12.95		ug/Kg	☼	97	74 - 134		
F-53B Minor	<0.221		13.4	12.08		ug/Kg	☼	90	66 - 136		
4:2 FTS	0.872	J	13.3	12.79		ug/Kg	☼	89	68 - 143		
8:2 FTS	1.10	J	13.7	14.21		ug/Kg	☼	96	75 - 135		
HFPO-DA (GenX)	<0.292		14.2	13.06		ug/Kg	☼	92	53 - 158		
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<0.342		14.2	15.29		ug/Kg	☼	107	72 - 132		
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<0.164		14.2	11.77		ug/Kg	☼	83	72 - 132		
Perfluorobutanesulfonic acid (PFBS)	1.63		12.6	13.49		ug/Kg	☼	94	69 - 129		
Perfluorobutanoic acid (PFBA)	21.3	F1	14.2	22.63	F1	ug/Kg	☼	9	76 - 136		
Perfluorodecanesulfonic acid (PFDS)	<0.370		13.7	12.39		ug/Kg	☼	90	71 - 131		
Perfluorodecanoic acid (PFDA)	0.579	J	14.2	13.99		ug/Kg	☼	94	72 - 132		
Perfluorododecanoic acid (PFDoA)	<0.213		14.2	14.17		ug/Kg	☼	100	71 - 131		
Perfluoroheptanesulfonic acid (PFHpS)	<0.349		13.6	15.50		ug/Kg	☼	114	76 - 136		

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

Lab Sample ID: 320-90058-A-12-B MS
Matrix: Solid
Analysis Batch: 604880

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 604445

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Perfluoroheptanoic acid (PFHpA)	100		14.2	40.28	4	ug/Kg	☼	-423	71 - 131
Perfluorohexanesulfonic acid (PFHxS)	0.293	J	13.0	12.97		ug/Kg	☼	98	62 - 122
Perfluorononanesulfonic acid (PFNS)	<0.206		13.7	14.57		ug/Kg	☼	106	72 - 132
Perfluorononanoic acid (PFNA)	0.436	J	14.2	13.83		ug/Kg	☼	94	73 - 133
Perfluorooctanesulfonamide (FOSA)	0.239	J	14.2	14.36		ug/Kg	☼	99	77 - 137
Perfluorooctanesulfonic acid (PFOS)	1.60		13.2	14.73		ug/Kg	☼	99	68 - 141
Perfluorooctanoic acid (PFOA)	2.38		14.2	15.67		ug/Kg	☼	93	72 - 132
Perfluoropentanesulfonic acid (PFPeS)	<0.263		13.3	12.13		ug/Kg	☼	91	66 - 126
Perfluoropentanoic acid (PFPeA)	61.3		14.2	38.93	4	ug/Kg	☼	-157	69 - 129
Perfluorotetradecanoic acid (PFTeA)	<0.263		14.2	13.62		ug/Kg	☼	96	67 - 127
Perfluorotridecanoic acid (PFTriA)	<0.149		14.2	13.11		ug/Kg	☼	92	71 - 131
Perfluoroundecanoic acid (PFUnA)	<0.299		14.2	13.09		ug/Kg	☼	92	66 - 126

Isotope Dilution	*MS %Recovery*	*MS Qualifier*	*Limits*
13C8 FOSA	*68*		*25 - 150*
13C3 HFPO-DA	*87*		*25 - 150*
13C4 PFBA	*35*		*25 - 150*
13C3 PFBS	*77*		*25 - 150*
13C2 PFDA	*82*		*25 - 150*
13C2 PFDoA	*77*		*25 - 150*
13C4 PFHpA	*86*		*25 - 150*
13C5 PFNA	*85*		*25 - 150*
13C4 PFOA	*85*		*25 - 150*
13C4 PFOS	*65*		*25 - 150*
13C5 PFPeA	*79*		*25 - 150*
13C2 PFTeDA	*56*		*25 - 150*
13C2 PFUnA	*85*		*25 - 150*
d5-NEtFOSAA	*69*		*25 - 150*
d3-NMeFOSAA	*73*		*25 - 150*
M2-4:2 FTS	*78*		*25 - 150*
M2-8:2 FTS	*78*		*25 - 150*
18O2 PFHxS	*72*		*25 - 150*

Lab Sample ID: 320-90058-A-12-C MSD
Matrix: Solid
Analysis Batch: 604880

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 604445

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<0.277		13.6	18.85		ug/Kg	☼	139	79 - 139	9	30
F-53B Major	<0.249		13.4	13.85		ug/Kg	☼	103	74 - 134	7	30
F-53B Minor	<0.221		13.6	13.02		ug/Kg	☼	96	66 - 136	8	30
4:2 FTS	0.872	J	13.5	14.97		ug/Kg	☼	105	68 - 143	16	30

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

Lab Sample ID: 320-90058-A-12-C MSD
Matrix: Solid
Analysis Batch: 604880

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 604445

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
8:2 FTS	1.10	J	13.8	16.82		ug/Kg	☼	114	75 - 135	17	30
HFPO-DA (GenX)	<0.292		14.4	13.77		ug/Kg	☼	96	53 - 158	5	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<0.342		14.4	16.25		ug/Kg	☼	113	72 - 132	6	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<0.164		14.4	12.35		ug/Kg	☼	86	72 - 132	5	30
Perfluorobutanesulfonic acid (PFBS)	1.63		12.8	14.53		ug/Kg	☼	101	69 - 129	7	30
Perfluorobutanoic acid (PFBA)	21.3	F1	14.4	22.08	F1	ug/Kg	☼	6	76 - 136	2	30
Perfluorodecanesulfonic acid (PFDS)	<0.370		13.8	12.73		ug/Kg	☼	92	71 - 131	3	30
Perfluorodecanoic acid (PFDA)	0.579	J	14.4	14.93		ug/Kg	☼	100	72 - 132	7	30
Perfluorododecanoic acid (PFDoA)	<0.213		14.4	14.86		ug/Kg	☼	103	71 - 131	5	30
Perfluoroheptanesulfonic acid (PFHpS)	<0.349		13.7	15.88		ug/Kg	☼	116	76 - 136	2	30
Perfluoroheptanoic acid (PFHpA)	100		14.4	52.08	4	ug/Kg	☼	-336	71 - 131	26	30
Perfluorohexanesulfonic acid (PFHxS)	0.293	J	13.1	14.02		ug/Kg	☼	105	62 - 122	8	30
Perfluorononanesulfonic acid (PFNS)	<0.206		13.8	14.61		ug/Kg	☼	106	72 - 132	0	30
Perfluorononanoic acid (PFNA)	0.436	J	14.4	15.89		ug/Kg	☼	108	73 - 133	14	30
Perfluorooctanesulfonamide (FOSA)	0.239	J	14.4	15.02		ug/Kg	☼	103	77 - 137	4	30
Perfluorooctanesulfonic acid (PFOS)	1.60		13.4	16.02		ug/Kg	☼	108	68 - 141	8	30
Perfluorooctanoic acid (PFOA)	2.38		14.4	18.25		ug/Kg	☼	110	72 - 132	15	30
Perfluoropentanesulfonic acid (PFPeS)	<0.263		13.5	14.01		ug/Kg	☼	104	66 - 126	14	30
Perfluoropentanoic acid (PFPeA)	61.3		14.4	37.52	4	ug/Kg	☼	-166	69 - 129	4	30
Perfluorotetradecanoic acid (PFTeA)	<0.263		14.4	14.48		ug/Kg	☼	101	67 - 127	6	30
Perfluorotridecanoic acid (PFTriA)	<0.149		14.4	14.92		ug/Kg	☼	104	71 - 131	13	30
Perfluoroundecanoic acid (PFUnA)	<0.299		14.4	13.43		ug/Kg	☼	93	66 - 126	3	30

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
13C8 FOSA	*75*		*25 - 150*
13C3 HFPO-DA	*95*		*25 - 150*
13C4 PFBA	*38*		*25 - 150*
13C3 PFBS	*79*		*25 - 150*
13C2 PFDA	*88*		*25 - 150*
13C2 PFDoA	*81*		*25 - 150*
13C4 PFHpA	*95*		*25 - 150*
13C5 PFNA	*92*		*25 - 150*
13C4 PFOA	*88*		*25 - 150*
13C4 PFOS	*71*		*25 - 150*
13C5 PFPeA	*80*		*25 - 150*
13C2 PFTeDA	*65*		*25 - 150*
13C2 PFUnA	*93*		*25 - 150*
d5-NEtFOSAA	*71*		*25 - 150*

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

Lab Sample ID: 320-90058-A-12-C MSD
Matrix: Solid
Analysis Batch: 604880

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 604445

Isotope Dilution	*MSD %Recovery*	*MSD Qualifier*	*Limits*
d3-NMeFOSAA	*74*		*25 - 150*
M2-4:2 FTS	*86*		*25 - 150*
M2-8:2 FTS	*77*		*25 - 150*
18O2 PFHxS	*81*		*25 - 150*

Method: D 2216 - Percent Moisture

Lab Sample ID: 320-90010-A-42 DU
Matrix: Solid
Analysis Batch: 603255

Client Sample ID: Duplicate
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Percent Moisture	11.3			11.8		%				4	20
Percent Solids	88.7			88.2		%				0.6	20

Isotope Dilution Summary

Client: City of Flint
Project/Site: Biosolids Cake 2022-07-14-E

Job ID: 190-29193-1

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)
190-29193-1	COF WPCF Centrifuge	57	35	0.8 *5-	47	72	46	78	40
320-90058-A-12-B MS	Matrix Spike	68	87	35	77	82	77	86	
320-90058-A-12-C MSD	Matrix Spike Duplicate	75	95	38	79	88	81	95	
LCS 320-604445/2-A	Lab Control Sample	81	86	45	80	87	87	91	83
MB 320-604445/1-A	Method Blank	86	90	48	84	91	87	92	85

		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)
190-29193-1	COF WPCF Centrifuge	86	86	73	4 *5-	31	69	49	50
320-90058-A-12-B MS	Matrix Spike	85	85	65	79	56	85	69	73
320-90058-A-12-C MSD	Matrix Spike Duplicate	92	88	71	80	65	93	71	74
LCS 320-604445/2-A	Lab Control Sample	87	89	80	80	81	92	79	79
MB 320-604445/1-A	Method Blank	89	88	76	87	83	94	84	85

		Percent Isotope Dilution Recovery (Acceptance Limits)			
		M242FTS	M262FTS	M282FTS	PFHxS
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	(25-150)
190-29193-1	COF WPCF Centrifuge	37	144	126	86
320-90058-A-12-B MS	Matrix Spike	78		78	72
320-90058-A-12-C MSD	Matrix Spike Duplicate	86		77	81
LCS 320-604445/2-A	Lab Control Sample	95	99	85	84
MB 320-604445/1-A	Method Blank	98	96	93	85

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

QC Association Summary

Client: City of Flint
Project/Site: Biosolids Cake 2022-07-14-E

Job ID: 190-29193-1

LCMS

Prep Batch: 604445

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
190-29193-1	COF WPCF Centrifuge	Total/NA	Solid	SHAKE	
MB 320-604445/1-A	Method Blank	Total/NA	Solid	SHAKE	
LCS 320-604445/2-A	Lab Control Sample	Total/NA	Solid	SHAKE	
320-90058-A-12-B MS	Matrix Spike	Total/NA	Solid	SHAKE	
320-90058-A-12-C MSD	Matrix Spike Duplicate	Total/NA	Solid	SHAKE	

Analysis Batch: 604880

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
190-29193-1	COF WPCF Centrifuge	Total/NA	Solid	537 (modified)	604445
MB 320-604445/1-A	Method Blank	Total/NA	Solid	537 (modified)	604445
LCS 320-604445/2-A	Lab Control Sample	Total/NA	Solid	537 (modified)	604445
320-90058-A-12-B MS	Matrix Spike	Total/NA	Solid	537 (modified)	604445
320-90058-A-12-C MSD	Matrix Spike Duplicate	Total/NA	Solid	537 (modified)	604445

General Chemistry

Analysis Batch: 603255

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
190-29193-1	COF WPCF Centrifuge	Total/NA	Solid	D 2216	
320-90010-A-42 DU	Duplicate	Total/NA	Solid	D 2216	

Lab Chronicle

Client: City of Flint
Project/Site: Biosolids Cake 2022-07-14-E

Job ID: 190-29193-1

Client Sample ID: COF WPCF Centrifuge

Lab Sample ID: 190-29193-1
Date Collected: 07/12/22 10:08
Matrix: Solid
Date Received: 07/14/22 15:28

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	D 2216		1	603255	07/15/22 15:36	TCS	EETNCA SA

Client Sample ID: COF WPCF Centrifuge

Lab Sample ID: 190-29193-1
Date Collected: 07/12/22 10:08
Matrix: Solid
Date Received: 07/14/22 15:28
Percent Solids: 34.6

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	SHAKE			604445	07/20/22 19:01	AM	EETNCA SA
Total/NA	Analysis	537 (modified)		1	604880	07/22/22 17:57	D1R	EETNCA SA

Laboratory References:

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

Analyst References:

Lab: EETNCA SAC

Batch Type: Prep

AM = Andrew Martin

Batch Type: Analysis

D1R = Dhatpakorn Ruangyotsakul

TCS = Tammy Saechao

Method Summary

Client: City of Flint
Project/Site: Biosolids Cake 2022-07-14-E

Job ID: 190-29193-1

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

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

Definitions/Glossary

Client: City of Flint
Job ID: 190-29193-1
Project/Site: Biosolids Cake 2022-07-14-E

Qualifiers

LCMS

Qualifier	Qualifier Description
*5-	Isotope dilution analyte is outside acceptance limits, low biased.
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
F1	MS and/or MSD recovery exceeds control limits.
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

CITY OF FLINT WATER POLLUTION CONTROL FACILITIES
ENVIRONMENTAL LABORATORY SERVICES SHIPPER/RECEIVER

PROJECT NUMBER: 2022-07-14-E | **PURCHASE ORDER: 23-004771** | **PROJECT NAME: Flint WPCF Contract Environmental Monitoring Services**

QTY	SAMPLE					SAMPLING LOCATION	NUMBER OF CONTAINERS	ANALYTICAL PARAMETERS	PRICE	
	NUMBER	DATE	TIME	TYPE	MEDIUM				UNIT	EXTENDED
1		07/12/22	10:08 a.m.	Grab	Biosolids Cake	*COF WPCF Centrifuge	2, 250-ml HDPE bottles	PFAS, Standard List (28 Analytes) by EPA Modified Method 537	$265.00	$265.00
									TOTAL PRICE	$265.00

SAMPLE CONDITION:			SAMPLE LOCATION:		
RELINQUISHED BY:	DATE: 07/14/22	TIME: 11:45	RECEIVED BY:	DATE: 7/14/22	TIME: 15:28
RECEIVED BY:	DATE: 07/14/22	TIME: 1150	RELINQUISHED BY:	DATE:	TIME:
RELINQUISHED BY:	DATE: 7/14/22	TIME: 1300	RECEIVED BY:	DATE:	TIME:

SPECIAL REQUESTS: *Report results to the Method Detection Limit (MDL) and No Pre-prep. Dilution.

REPORT TO: Eric Brubaker, Laboratory Supervisor, Water Pollution Control Facilities, G-4652 Beecher Rd., Flint, MI 48532; 810-230-3152 (phone) and 810-230-3154 (fax).

QC report audited by _____ on _____. Invoice checked and forwarded by _____ on _____. Data entered by _____ on _____.

eurofins | Environment Testing TestAmerica

☐ SDS or Known Hazard Information Supplied by Client
☐ Discrepancies
☐ Short Hold
☐ Rush ☐ 24 Hr ☐ 2-Day ☐ 3-Day ☐ 5-Day ☐ Other: _____

Client ID: City of Flint Pilot
Work Oder #: 29193

Receipt Evaluation Performed by: Initials: DP Date: 7/14 Time: 15:28

Cooler / Sample Receipt

After hours receipt: complete gray areas. Place cooler in walk-in, place form in Receiving box. Date: _____ Time: _____

Method of Shipment:
Walk-In Client Eurofins TA Field/Courier
Other Client / 3rd Party Courier: _____
Fed Ex Tracking #: _____
UPS Tracking #: _____
Other: _____

Shipping Container Type:
☑ Cooler ☐ Box
☐ None ☐ Other: _____

Packing Materials:
☑ Plastic Bags ☐ Foam
☐ Bubble Wrap ☐ Paper
☐ Packing Peanuts ☐ None
☐ Other: _____

Custody Seals Intact:
☐ Yes ☐ No
☒ NA (not used or required)

Cooling Materials:
☐ Ice (Solid) ☐ Ice (Melted)
☐ Blue Ice ☐ None
☐ Other: _____

Bacteriological Samples	Temp Corrected (°C)	Frozen? Yes	Frozen? No	Rec'd Within 2 Hrs? Yes	Rec'd Within 2 Hrs? No	Sample Flagged? Yes	Sample Flagged? No

Received on same day sampled? Yes No Additional Sheets Required? Yes No

Receipt Temperatures

Thermometer ID	Observed (°C)	Corrected (°C)	Temp Blank	Sample Temp	Acceptable	Cooler ID	Affected Samples
CP3B3207	5.5	5.5	✓	✓	Y N		
					Y N		
					Y N		

Receipt Questions**	Y	N	NA	"No" answers require additional comment
CoC present and ETA receipt signature, date, and time properly documented?	✓			
Containers and Labels in good condition? *(unbroken, not leaking, appropriately filled, labels legible & attached)*	✓			
Appropriate containers used and adequate volume provided?	✓			Preserved bottles checked for pH?* Yes No
Number of sample containers match CoC?	✓			pH strip lot # _____
Samples received within hold?	✓			
Samples submitted for GRO and Volatiles analysis (8260, 624, 524) received without headspace?	✓		✓	
Was a Trip Blank received with VOA samples?			✓	
Were the samples free of any questionable physical conformities? (i.e.; field duplicates or multiple bottles of the same sample do not significantly vary in appearance – color, solid proportions, etc.)	✓			
Were the CoC bottle labels and all other items free of all other discrepancies or issues that would need to be addressed with the Project Manager and/or Client?	✓			
**May not be applicable if samples are not for compliance testing				*Excludes FOG, VOAs, TOC Vials, HEM

Client Contact Record

Contact Via: ☐ Phone ☐ Email ☐ Other: _____ Person Contacted: _____ Date/Time: _____
☐ Discrepancy allowance agreement is on record in the client project file

Discussion / Resolution

Any additional documentation and clarification from the client must be noted in the narrative and/or scanned into the CoC directory.
Reviewed by _____ Date: 7/14/2022

WI-MI-010_020720

Eurofins Michigan
10448 Citation Drive Suite 200
Brighton, MI 48116
Phone: 810-229-2763 Fax: 810-229-0000

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Schafer, Sue	Carrier Tracking No(s):	COC No: 190-33275.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Sue.Schafer@et.eurofinsus.com	State of Origin: Michigan	Page: Page 1 of 1
Company: Eurofins Environment Testing Northern Ca		Accreditations Required (See note):		Job #: 190-29193-1
Address: 880 Riverside Parkway, ,	Due Date Requested: 7/27/2022			
City: West Sacramento	TAT Requested (days):			
State, Zip: CA, 95605				
Phone: 916-373-5600(Tel) 916-372-1059(Fax)	PO #:			
Email:	WO #:			
Project Name: Biosolids Cake 2022-07-14-E	Project #: 19002397			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, 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)	PFC_IDA/Shake_Bath_14D PFAS 28	Moisture	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
COF WPCF Centrifuge (190-29193-1)	7/12/22	10:08 Eastern		Solid			X	X	2	PLEASE NO PRE PREP DILUTIONS - LIMIT 10X POST PREP - CLIENT NEEDS

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central, LLC 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 Environment Testing North Central, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing North Central, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Environment Testing North Central, LLC.

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:	7/14/22 15:30	ET TA		7/15/22 0940	ET TA
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.: 1794884	Cooler Temperature(s) °C and Other Remarks: 2.4

Ver: 06/08/2021

Eurofins Michigan
10448 Citation Drive Suite 200
Brighton, MI 48116
Phone: 810-229-2763 Fax: 810-229-0000

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Schafer, Sue	Carrier Tracking No(s):	COC No: 190-33275.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Sue.Schafer@et.eurofinsus.com	State of Origin: Michigan	Page: Page 1 of 1
Company: Eurofins Environment Testing Northern Ca		Accreditations Required (See note):		Job #: 190-29193-1
Address: 880 Riverside Parkway, ,	Due Date Requested: 7/27/2022			
City: West Sacramento	TAT Requested (days):			
State, Zip: CA, 95605				
Phone: 916-373-5600(Tel) 916-372-1059(Fax)	PO #:			
Email:	WO #:			
Project Name: Biosolids Cake 2022-07-14-E	Project #: 19002397			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, 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)	PFC_IDA/Shake_Bath_14D PFAS 28	Moisture	Total Number of containers	Special Instructions/Note:
			Preservation Code:							
COF WPCF Centrifuge (190-29193-1)	7/12/22	10:08 Eastern		Solid			X	X	2	PLEASE NO PRE PREP DILUTIONS - LIMIT 10X POST PREP - CLIENT NEEDS

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central, LLC 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 Environment Testing North Central, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing North Central, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Environment Testing North Central, LLC.

Possible Hazard Identification: Unconfirmed	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ 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:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]	7/14/22 15:30	EETA	[signature]	7/15/22 0940	EETA
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.: 1794884	Cooler Temperature(s) °C and Other Remarks: 2.4

Ver: 06/08/2021

Method Summary

Client: City of Flint
Project/Site: Biosolids Cake 2022-07-14-E

Job ID: 190-29193-1

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

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

eurofins | Environment Testing America

ANALYTICAL REPORT

Eurofins Michigan
10448 Citation Drive
Suite 200
Brighton, MI 48116
Tel: (810)229-2763

Laboratory Job ID: 190-29194-1
Client Project/Site: Plant Influent/ Final Effluent 2022-07-14-D

For:
City of Flint
PO BOX 246
Flint, Michigan 48501-4246

Attn: Eric Brubaker

Sue Schafer

Authorized for release by:
7/29/2022 7:08:56 AM

Sue Schafer, Project Manager II
(810)229-2763
Sue.Schafer@et.eurofinsus.com

Table of Contents

Sample Summary

Client: City of Flint
Job ID: 190-29194-1
Project/Site: Plant Influent/ Final Effluent 2022-07-14-D

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
190-29194-1	Northwest Pump Station	Water	07/12/22 11:14	07/14/22 15:37
190-29194-2	East Pump Station	Water	07/12/22 10:24	07/14/22 15:37
190-29194-3	Third Avenue Pump Station	Water	07/12/22 10:49	07/14/22 15:37
190-29194-4	Microstainer Bypass	Water	07/12/22 11:22	07/14/22 15:37

Case Narrative

Client: City of Flint
Job ID: 190-29194-1
Project/Site: Plant Influent/ Final Effluent 2022-07-14-D

Job ID: 190-29194-1

Laboratory: Eurofins Michigan

Narrative

Job Narrative
190-29194-1

Comments
No additional comments.

Receipt
The samples were received on 7/14/2022 3:37 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 5.5º C.

LCMS
Method 537 (modified): The "I" qualifier means the transition mass ratio for the indicated analyte was below the established ratio limits. The qualitative identification of the analyte has some degree of uncertainty. However, analyst judgment was used to positively identify the analyte.
Third Avenue Pump Station (190-29194-3)

Method 537 (modified): The "I" qualifier means the transition mass ratio for the indicated analyte was above 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.
Northwest Pump Station (190-29194-1), East Pump Station (190-29194-2) and Third Avenue Pump Station (190-29194-3)

Method 537 (modified): Isotope Dilution Analyte (IDA) recovery is above the method recommended limit for the following samples: Northwest Pump Station (190-29194-1) and Third Avenue Pump Station (190-29194-3). Quantitation by isotope dilution generally precludes any adverse effect on data quality due to elevated IDA recoveries.

Method 537 (modified): 13C2-PFOA Internal standard (ISTD) response for the following sample in analytical batch 320-604935 was outside acceptance criteria: Northwest Pump Station (190-29194-1). The sample was re-analyzed with concurring results. The internal standard is not used to quantitate target analytes; therefore, the data have been reported.

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

Organic Prep
Method 3535: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 320-604447.

320-604447
Method: PFC_IDA
Matrix: Water

Method 3535: The following samples in preparation batch 320-604447 were observed to have floating particulates present in the sample bottle. <AffectedSample>

320-604447
Method: PFC_IDA
Matrix: Water

Method 3535: The following samples in preparation batch 320-604447 were yellow in color following concentration. East Pump Station (190-29194-2), Third Avenue Pump Station (190-29194-3) and Microstainer Bypass (190-29194-4)

320-604447
Method: PFC_IDA
Matrix: Water

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

Client: City of Flint
Project/Site: Plant Influent/ Final Effluent 2022-07-14-D

Job ID: 190-29194-1

Client Sample ID: Northwest Pump Station
Date Collected: 07/12/22 11:14
Date Received: 07/14/22 15:37

Lab Sample ID: 190-29194-1
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 01:50	1
F-53B Major	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 01:50	1
F-53B Minor	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 01:50	1
4:2 FTS	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 01:50	1
6:2 FTS	<4.3		4.3		ng/L		07/20/22 19:07	07/23/22 01:50	1
8:2 FTS	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 01:50	1
HFPO-DA (GenX)	<3.4		3.4		ng/L		07/20/22 19:07	07/23/22 01:50	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<4.3		4.3		ng/L		07/20/22 19:07	07/23/22 01:50	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<4.3		4.3		ng/L		07/20/22 19:07	07/23/22 01:50	1
Perfluorobutanesulfonic acid (PFBS)	**9.6**		1.7		ng/L		07/20/22 19:07	07/23/22 01:50	1
Perfluorobutanoic acid (PFBA)	**5.4**		4.3		ng/L		07/20/22 19:07	07/23/22 01:50	1
Perfluorodecanesulfonic acid (PFDS)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 01:50	1
Perfluorodecanoic acid (PFDA)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 01:50	1
Perfluorododecanoic acid (PFDoA)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 01:50	1
Perfluoroheptanesulfonic acid (PFHpS)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 01:50	1
Perfluoroheptanoic acid (PFHpA)	**1.8**	I	1.7		ng/L		07/20/22 19:07	07/23/22 01:50	1
Perfluorohexanesulfonic acid (PFHxS)	**4.6**		1.7		ng/L		07/20/22 19:07	07/23/22 01:50	1
Perfluorohexanoic acid (PFHxA)	**3.9**		1.7		ng/L		07/20/22 19:07	07/23/22 01:50	1
Perfluorononanesulfonic acid (PFNS)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 01:50	1
Perfluorononanoic acid (PFNA)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 01:50	1
Perfluorooctanesulfonamide (FOSA)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 01:50	1
Perfluorooctanesulfonic acid (PFOS)	**6.8**		1.7		ng/L		07/20/22 19:07	07/23/22 01:50	1
Perfluorooctanoic acid (PFOA)	**7.2**		1.7		ng/L		07/20/22 19:07	07/23/22 01:50	1
Perfluoropentanesulfonic acid (PFPeS)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 01:50	1
Perfluoropentanoic acid (PFPeA)	**5.0**		1.7		ng/L		07/20/22 19:07	07/23/22 01:50	1
Perfluorotetradecanoic acid (PFTeA)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 01:50	1
Perfluorotridecanoic acid (PFTriA)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 01:50	1
Perfluoroundecanoic acid (PFUnA)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 01:50	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*127*		*25 - 150*	*07/20/22 19:07*	*07/23/22 01:50*	*1*
13C3 HFPO-DA	*132*		*25 - 150*	*07/20/22 19:07*	*07/23/22 01:50*	*1*
13C4 PFBA	*116*		*25 - 150*	*07/20/22 19:07*	*07/23/22 01:50*	*1*
13C3 PFBS	*133*		*25 - 150*	*07/20/22 19:07*	*07/23/22 01:50*	*1*
13C2 PFDA	*136*		*25 - 150*	*07/20/22 19:07*	*07/23/22 01:50*	*1*
13C2 PFDoA	*115*		*25 - 150*	*07/20/22 19:07*	*07/23/22 01:50*	*1*
13C4 PFHpA	*141*		*25 - 150*	*07/20/22 19:07*	*07/23/22 01:50*	*1*
13C2 PFHxA	*162*	*5+	*25 - 150*	*07/20/22 19:07*	*07/23/22 01:50*	*1*
13C5 PFNA	*151*	*5+	*25 - 150*	*07/20/22 19:07*	*07/23/22 01:50*	*1*
13C4 PFOA	*77*		*25 - 150*	*07/20/22 19:07*	*07/23/22 01:50*	*1*
13C4 PFOS	*127*		*25 - 150*	*07/20/22 19:07*	*07/23/22 01:50*	*1*
13C5 PFPeA	*132*		*25 - 150*	*07/20/22 19:07*	*07/23/22 01:50*	*1*
13C2 PFTeDA	*104*		*25 - 150*	*07/20/22 19:07*	*07/23/22 01:50*	*1*
13C2 PFUnA	*146*		*25 - 150*	*07/20/22 19:07*	*07/23/22 01:50*	*1*

Client: City of Flint
Job ID: 190-29194-1
Project/Site: Plant Influent/ Final Effluent 2022-07-14-D

Client Sample ID: Northwest Pump Station
Lab Sample ID: 190-29194-1
Date Collected: 07/12/22 11:14
Matrix: Water
Date Received: 07/14/22 15:37

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

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
d5-NEtFOSAA	155	*5+	25 - 150	07/20/22 19:07	07/23/22 01:50	1
d3-NMeFOSAA	137		25 - 150	07/20/22 19:07	07/23/22 01:50	1
M2-4:2 FTS	162	*5+	25 - 150	07/20/22 19:07	07/23/22 01:50	1
M2-6:2 FTS	98		25 - 150	07/20/22 19:07	07/23/22 01:50	1
M2-8:2 FTS	177	*5+	25 - 150	07/20/22 19:07	07/23/22 01:50	1
18O2 PFHxS	125		25 - 150	07/20/22 19:07	07/23/22 01:50	1

Client: City of Flint
Job ID: 190-29194-1
Project/Site: Plant Influent/ Final Effluent 2022-07-14-D

Client Sample ID: East Pump Station
Date Collected: 07/12/22 10:24
Date Received: 07/14/22 15:37

Lab Sample ID: 190-29194-2
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:00	1
F-53B Major	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:00	1
F-53B Minor	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:00	1
4:2 FTS	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:00	1
6:2 FTS	<4.3		4.3		ng/L		07/20/22 19:07	07/23/22 02:00	1
8:2 FTS	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:00	1
HFPO-DA (GenX)	<3.4		3.4		ng/L		07/20/22 19:07	07/23/22 02:00	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<4.3		4.3		ng/L		07/20/22 19:07	07/23/22 02:00	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<4.3		4.3		ng/L		07/20/22 19:07	07/23/22 02:00	1
Perfluorobutanesulfonic acid (PFBS)	**4.9**	I	1.7		ng/L		07/20/22 19:07	07/23/22 02:00	1
Perfluorobutanoic acid (PFBA)	**4.5**		4.3		ng/L		07/20/22 19:07	07/23/22 02:00	1
Perfluorodecanesulfonic acid (PFDS)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:00	1
Perfluorodecanoic acid (PFDA)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:00	1
Perfluorododecanoic acid (PFDoA)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:00	1
Perfluoroheptanesulfonic acid (PFHpS)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:00	1
Perfluoroheptanoic acid (PFHpA)	**1.8**		1.7		ng/L		07/20/22 19:07	07/23/22 02:00	1
Perfluorohexanesulfonic acid (PFHxS)	**14**		1.7		ng/L		07/20/22 19:07	07/23/22 02:00	1
Perfluorohexanoic acid (PFHxA)	**4.8**		1.7		ng/L		07/20/22 19:07	07/23/22 02:00	1
Perfluorononanesulfonic acid (PFNS)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:00	1
Perfluorononanoic acid (PFNA)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:00	1
Perfluorooctanesulfonamide (FOSA)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:00	1
Perfluorooctanesulfonic acid (PFOS)	**23**		1.7		ng/L		07/20/22 19:07	07/23/22 02:00	1
Perfluorooctanoic acid (PFOA)	**4.3**		1.7		ng/L		07/20/22 19:07	07/23/22 02:00	1
Perfluoropentanesulfonic acid (PFPeS)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:00	1
Perfluoropentanoic acid (PFPeA)	**2.8**		1.7		ng/L		07/20/22 19:07	07/23/22 02:00	1
Perfluorotetradecanoic acid (PFTeA)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:00	1
Perfluorotridecanoic acid (PFTriA)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:00	1
Perfluoroundecanoic acid (PFUnA)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:00	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*63*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:00*	*1*
13C3 HFPO-DA	*80*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:00*	*1*
13C4 PFBA	*56*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:00*	*1*
13C3 PFBS	*72*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:00*	*1*
13C2 PFDA	*73*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:00*	*1*
13C2 PFDoA	*51*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:00*	*1*
13C4 PFHpA	*90*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:00*	*1*
13C2 PFHxA	*87*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:00*	*1*
13C5 PFNA	*80*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:00*	*1*
13C4 PFOA	*87*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:00*	*1*
13C4 PFOS	*77*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:00*	*1*
13C5 PFPeA	*66*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:00*	*1*
13C2 PFTeDA	*39*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:00*	*1*
13C2 PFUnA	*64*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:00*	*1*

Client: City of Flint
Job ID: 190-29194-1
Project/Site: Plant Influent/ Final Effluent 2022-07-14-D

Client Sample ID: East Pump Station
Lab Sample ID: 190-29194-2
Date Collected: 07/12/22 10:24
Matrix: Water
Date Received: 07/14/22 15:37

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

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
d5-NEtFOSAA	38		25 - 150	07/20/22 19:07	07/23/22 02:00	1
d3-NMeFOSAA	40		25 - 150	07/20/22 19:07	07/23/22 02:00	1
M2-4:2 FTS	95		25 - 150	07/20/22 19:07	07/23/22 02:00	1
M2-6:2 FTS	107		25 - 150	07/20/22 19:07	07/23/22 02:00	1
M2-8:2 FTS	64		25 - 150	07/20/22 19:07	07/23/22 02:00	1
18O2 PFHxS	83		25 - 150	07/20/22 19:07	07/23/22 02:00	1

Client: City of Flint
Project/Site: Plant Influent/ Final Effluent 2022-07-14-D

Job ID: 190-29194-1

Client Sample ID: Third Avenue Pump Station
Date Collected: 07/12/22 10:49
Date Received: 07/14/22 15:37

Lab Sample ID: 190-29194-3
Matrix: Water

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<1.8		1.8		ng/L		07/20/22 19:07	07/23/22 02:10	1
F-53B Major	<1.8		1.8		ng/L		07/20/22 19:07	07/23/22 02:10	1
F-53B Minor	<1.8		1.8		ng/L		07/20/22 19:07	07/23/22 02:10	1
4:2 FTS	<1.8		1.8		ng/L		07/20/22 19:07	07/23/22 02:10	1
6:2 FTS	<4.5		4.5		ng/L		07/20/22 19:07	07/23/22 02:10	1
8:2 FTS	<1.8		1.8		ng/L		07/20/22 19:07	07/23/22 02:10	1
HFPO-DA (GenX)	<3.6		3.6		ng/L		07/20/22 19:07	07/23/22 02:10	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<4.5		4.5		ng/L		07/20/22 19:07	07/23/22 02:10	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<4.5		4.5		ng/L		07/20/22 19:07	07/23/22 02:10	1
Perfluorobutanesulfonic acid (PFBS)	**5.8**	I	1.8		ng/L		07/20/22 19:07	07/23/22 02:10	1
Perfluorobutanoic acid (PFBA)	**4.6**		4.5		ng/L		07/20/22 19:07	07/23/22 02:10	1
Perfluorodecanesulfonic acid (PFDS)	<1.8		1.8		ng/L		07/20/22 19:07	07/23/22 02:10	1
Perfluorodecanoic acid (PFDA)	<1.8		1.8		ng/L		07/20/22 19:07	07/23/22 02:10	1
Perfluorododecanoic acid (PFDoA)	<1.8		1.8		ng/L		07/20/22 19:07	07/23/22 02:10	1
Perfluoroheptanesulfonic acid (PFHpS)	<1.8		1.8		ng/L		07/20/22 19:07	07/23/22 02:10	1
Perfluoroheptanoic acid (PFHpA)	<1.8		1.8		ng/L		07/20/22 19:07	07/23/22 02:10	1
Perfluorohexanesulfonic acid (PFHxS)	**4.2**		1.8		ng/L		07/20/22 19:07	07/23/22 02:10	1
Perfluorohexanoic acid (PFHxA)	**3.9**		1.8		ng/L		07/20/22 19:07	07/23/22 02:10	1
Perfluorononanesulfonic acid (PFNS)	<1.8		1.8		ng/L		07/20/22 19:07	07/23/22 02:10	1
Perfluorononanoic acid (PFNA)	<1.8		1.8		ng/L		07/20/22 19:07	07/23/22 02:10	1
Perfluorooctanesulfonamide (FOSA)	<1.8		1.8		ng/L		07/20/22 19:07	07/23/22 02:10	1
Perfluorooctanesulfonic acid (PFOS)	**5.3**		1.8		ng/L		07/20/22 19:07	07/23/22 02:10	1
Perfluorooctanoic acid (PFOA)	**3.4**	I	1.8		ng/L		07/20/22 19:07	07/23/22 02:10	1
Perfluoropentanesulfonic acid (PFPeS)	<1.8		1.8		ng/L		07/20/22 19:07	07/23/22 02:10	1
Perfluoropentanoic acid (PFPeA)	**5.5**		1.8		ng/L		07/20/22 19:07	07/23/22 02:10	1
Perfluorotetradecanoic acid (PFTeA)	<1.8		1.8		ng/L		07/20/22 19:07	07/23/22 02:10	1
Perfluorotridecanoic acid (PFTriA)	<1.8		1.8		ng/L		07/20/22 19:07	07/23/22 02:10	1
Perfluoroundecanoic acid (PFUnA)	<1.8		1.8		ng/L		07/20/22 19:07	07/23/22 02:10	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*58*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:10*	*1*
13C3 HFPO-DA	*82*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:10*	*1*
13C4 PFBA	*43*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:10*	*1*
13C3 PFBS	*66*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:10*	*1*
13C2 PFDA	*77*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:10*	*1*
13C2 PFDoA	*49*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:10*	*1*
13C4 PFHpA	*93*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:10*	*1*
13C2 PFHxA	*90*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:10*	*1*
13C5 PFNA	*84*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:10*	*1*
13C4 PFOA	*90*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:10*	*1*
13C4 PFOS	*71*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:10*	*1*
13C5 PFPeA	*62*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:10*	*1*
13C2 PFTeDA	*34*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:10*	*1*
13C2 PFUnA	*68*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:10*	*1*

Client: City of Flint
Job ID: 190-29194-1
Project/Site: Plant Influent/ Final Effluent 2022-07-14-D

Client Sample ID: Third Avenue Pump Station
Lab Sample ID: 190-29194-3
Date Collected: 07/12/22 10:49
Matrix: Water
Date Received: 07/14/22 15:37

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

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
d5-NEtFOSAA	47		25 - 150	07/20/22 19:07	07/23/22 02:10	1
d3-NMeFOSAA	41		25 - 150	07/20/22 19:07	07/23/22 02:10	1
M2-4:2 FTS	101		25 - 150	07/20/22 19:07	07/23/22 02:10	1
M2-6:2 FTS	153	*5+	25 - 150	07/20/22 19:07	07/23/22 02:10	1
M2-8:2 FTS	123		25 - 150	07/20/22 19:07	07/23/22 02:10	1
18O2 PFHxS	85		25 - 150	07/20/22 19:07	07/23/22 02:10	1

Client: City of Flint
Job ID: 190-29194-1
Project/Site: Plant Influent/ Final Effluent 2022-07-14-D

Client Sample ID: Microstainer Bypass
Lab Sample ID: 190-29194-4
Date Collected: 07/12/22 11:22
Matrix: Water
Date Received: 07/14/22 15:37

Method: 537 (modified) - Fluorinated Alkyl Substances

Analyte	Result	Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:41	1
F-53B Major	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:41	1
F-53B Minor	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:41	1
4:2 FTS	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:41	1
6:2 FTS	<4.1		4.1		ng/L		07/20/22 19:07	07/23/22 02:41	1
8:2 FTS	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:41	1
HFPO-DA (GenX)	<3.3		3.3		ng/L		07/20/22 19:07	07/23/22 02:41	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<4.1		4.1		ng/L		07/20/22 19:07	07/23/22 02:41	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<4.1		4.1		ng/L		07/20/22 19:07	07/23/22 02:41	1
Perfluorobutanesulfonic acid (PFBS)	**5.9**		1.7		ng/L		07/20/22 19:07	07/23/22 02:41	1
Perfluorobutanoic acid (PFBA)	**5.5**		4.1		ng/L		07/20/22 19:07	07/23/22 02:41	1
Perfluorodecanesulfonic acid (PFDS)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:41	1
Perfluorodecanoic acid (PFDA)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:41	1
Perfluorododecanoic acid (PFDoA)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:41	1
Perfluoroheptanesulfonic acid (PFHpS)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:41	1
Perfluoroheptanoic acid (PFHpA)	**1.8**		1.7		ng/L		07/20/22 19:07	07/23/22 02:41	1
Perfluorohexanesulfonic acid (PFHxS)	**8.3**		1.7		ng/L		07/20/22 19:07	07/23/22 02:41	1
Perfluorohexanoic acid (PFHxA)	**8.5**		1.7		ng/L		07/20/22 19:07	07/23/22 02:41	1
Perfluorononanesulfonic acid (PFNS)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:41	1
Perfluorononanoic acid (PFNA)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:41	1
Perfluorooctanesulfonamide (FOSA)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:41	1
Perfluorooctanesulfonic acid (PFOS)	**14**		1.7		ng/L		07/20/22 19:07	07/23/22 02:41	1
Perfluorooctanoic acid (PFOA)	**5.2**		1.7		ng/L		07/20/22 19:07	07/23/22 02:41	1
Perfluoropentanesulfonic acid (PFPeS)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:41	1
Perfluoropentanoic acid (PFPeA)	**10**		1.7		ng/L		07/20/22 19:07	07/23/22 02:41	1
Perfluorotetradecanoic acid (PFTeA)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:41	1
Perfluorotridecanoic acid (PFTriA)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:41	1
Perfluoroundecanoic acid (PFUnA)	<1.7		1.7		ng/L		07/20/22 19:07	07/23/22 02:41	1

Isotope Dilution	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*91*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:41*	*1*
13C3 HFPO-DA	*95*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:41*	*1*
13C4 PFBA	*68*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:41*	*1*
13C3 PFBS	*75*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:41*	*1*
13C2 PFDA	*91*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:41*	*1*
13C2 PFDoA	*77*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:41*	*1*
13C4 PFHpA	*100*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:41*	*1*
13C2 PFHxA	*98*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:41*	*1*
13C5 PFNA	*97*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:41*	*1*
13C4 PFOA	*98*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:41*	*1*
13C4 PFOS	*87*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:41*	*1*
13C5 PFPeA	*59*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:41*	*1*
13C2 PFTeDA	*54*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:41*	*1*
13C2 PFUnA	*89*		*25 - 150*	*07/20/22 19:07*	*07/23/22 02:41*	*1*

Client: City of Flint
Job ID: 190-29194-1
Project/Site: Plant Influent/ Final Effluent 2022-07-14-D

Client Sample ID: Microstainer Bypass
Lab Sample ID: 190-29194-4
Date Collected: 07/12/22 11:22
Matrix: Water
Date Received: 07/14/22 15:37

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

Isotope Dilution	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
d5-NEtFOSAA	95		25 - 150	07/20/22 19:07	07/23/22 02:41	1
d3-NMeFOSAA	92		25 - 150	07/20/22 19:07	07/23/22 02:41	1
M2-4:2 FTS	107		25 - 150	07/20/22 19:07	07/23/22 02:41	1
M2-6:2 FTS	114		25 - 150	07/20/22 19:07	07/23/22 02:41	1
M2-8:2 FTS	90		25 - 150	07/20/22 19:07	07/23/22 02:41	1
18O2 PFHxS	98		25 - 150	07/20/22 19:07	07/23/22 02:41	1

Method: 537 (modified) - Fluorinated Alkyl Substances

Lab Sample ID: MB 320-604447/1-A
Matrix: Water
Analysis Batch: 604935

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 604447

Analyte	MB Result	MB Qualifier	RL		Unit	D	Prepared	Analyzed	Dil Fac
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	<2.0		2.0		ng/L		07/20/22 19:07	07/23/22 00:39	1
F-53B Major	<2.0		2.0		ng/L		07/20/22 19:07	07/23/22 00:39	1
F-53B Minor	<2.0		2.0		ng/L		07/20/22 19:07	07/23/22 00:39	1
4:2 FTS	<2.0		2.0		ng/L		07/20/22 19:07	07/23/22 00:39	1
6:2 FTS	<5.0		5.0		ng/L		07/20/22 19:07	07/23/22 00:39	1
8:2 FTS	<2.0		2.0		ng/L		07/20/22 19:07	07/23/22 00:39	1
HFPO-DA (GenX)	<4.0		4.0		ng/L		07/20/22 19:07	07/23/22 00:39	1
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	<5.0		5.0		ng/L		07/20/22 19:07	07/23/22 00:39	1
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	<5.0		5.0		ng/L		07/20/22 19:07	07/23/22 00:39	1
Perfluorobutanesulfonic acid (PFBS)	<2.0		2.0		ng/L		07/20/22 19:07	07/23/22 00:39	1
Perfluorobutanoic acid (PFBA)	<5.0		5.0		ng/L		07/20/22 19:07	07/23/22 00:39	1
Perfluorodecanesulfonic acid (PFDS)	<2.0		2.0		ng/L		07/20/22 19:07	07/23/22 00:39	1
Perfluorodecanoic acid (PFDA)	<2.0		2.0		ng/L		07/20/22 19:07	07/23/22 00:39	1
Perfluorododecanoic acid (PFDoA)	<2.0		2.0		ng/L		07/20/22 19:07	07/23/22 00:39	1
Perfluoroheptanesulfonic acid (PFHpS)	<2.0		2.0		ng/L		07/20/22 19:07	07/23/22 00:39	1
Perfluoroheptanoic acid (PFHpA)	<2.0		2.0		ng/L		07/20/22 19:07	07/23/22 00:39	1
Perfluorohexanesulfonic acid (PFHxS)	<2.0		2.0		ng/L		07/20/22 19:07	07/23/22 00:39	1
Perfluorohexanoic acid (PFHxA)	<2.0		2.0		ng/L		07/20/22 19:07	07/23/22 00:39	1
Perfluorononanesulfonic acid (PFNS)	<2.0		2.0		ng/L		07/20/22 19:07	07/23/22 00:39	1
Perfluorononanoic acid (PFNA)	<2.0		2.0		ng/L		07/20/22 19:07	07/23/22 00:39	1
Perfluorooctanesulfonamide (FOSA)	<2.0		2.0		ng/L		07/20/22 19:07	07/23/22 00:39	1
Perfluorooctanesulfonic acid (PFOS)	<2.0		2.0		ng/L		07/20/22 19:07	07/23/22 00:39	1
Perfluorooctanoic acid (PFOA)	<2.0		2.0		ng/L		07/20/22 19:07	07/23/22 00:39	1
Perfluoropentanesulfonic acid (PFPeS)	<2.0		2.0		ng/L		07/20/22 19:07	07/23/22 00:39	1
Perfluoropentanoic acid (PFPeA)	<2.0		2.0		ng/L		07/20/22 19:07	07/23/22 00:39	1
Perfluorotetradecanoic acid (PFTeA)	<2.0		2.0		ng/L		07/20/22 19:07	07/23/22 00:39	1
Perfluorotridecanoic acid (PFTriA)	<2.0		2.0		ng/L		07/20/22 19:07	07/23/22 00:39	1
Perfluoroundecanoic acid (PFUnA)	<2.0		2.0		ng/L		07/20/22 19:07	07/23/22 00:39	1

Isotope Dilution	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
13C8 FOSA	*100*		*25 - 150*	*07/20/22 19:07*	*07/23/22 00:39*	*1*
13C3 HFPO-DA	*96*		*25 - 150*	*07/20/22 19:07*	*07/23/22 00:39*	*1*
13C4 PFBA	*92*		*25 - 150*	*07/20/22 19:07*	*07/23/22 00:39*	*1*
13C3 PFBS	*86*		*25 - 150*	*07/20/22 19:07*	*07/23/22 00:39*	*1*
13C2 PFDA	*98*		*25 - 150*	*07/20/22 19:07*	*07/23/22 00:39*	*1*
13C2 PFDoA	*96*		*25 - 150*	*07/20/22 19:07*	*07/23/22 00:39*	*1*
13C4 PFHpA	*96*		*25 - 150*	*07/20/22 19:07*	*07/23/22 00:39*	*1*
13C2 PFHxA	*98*		*25 - 150*	*07/20/22 19:07*	*07/23/22 00:39*	*1*
13C5 PFNA	*103*		*25 - 150*	*07/20/22 19:07*	*07/23/22 00:39*	*1*
13C4 PFOA	*97*		*25 - 150*	*07/20/22 19:07*	*07/23/22 00:39*	*1*
13C4 PFOS	*97*		*25 - 150*	*07/20/22 19:07*	*07/23/22 00:39*	*1*
13C5 PFPeA	*92*		*25 - 150*	*07/20/22 19:07*	*07/23/22 00:39*	*1*
13C2 PFTeDA	*84*		*25 - 150*	*07/20/22 19:07*	*07/23/22 00:39*	*1*
13C2 PFUnA	*109*		*25 - 150*	*07/20/22 19:07*	*07/23/22 00:39*	*1*
d5-NEtFOSAA	*116*		*25 - 150*	*07/20/22 19:07*	*07/23/22 00:39*	*1*

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

Lab Sample ID: MB 320-604447/1-A
Matrix: Water
Analysis Batch: 604935

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 604447

Isotope Dilution	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
d3-NMeFOSAA	111		25 - 150	07/20/22 19:07	07/23/22 00:39	1
M2-4:2 FTS	86		25 - 150	07/20/22 19:07	07/23/22 00:39	1
M2-6:2 FTS	100		25 - 150	07/20/22 19:07	07/23/22 00:39	1
M2-8:2 FTS	94		25 - 150	07/20/22 19:07	07/23/22 00:39	1
18O2 PFHxS	96		25 - 150	07/20/22 19:07	07/23/22 00:39	1

Lab Sample ID: LCS 320-604447/2-A
Matrix: Water
Analysis Batch: 604935

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 604447

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)	37.8	42.8		ng/L		113	79 - 139
F-53B Major	37.4	40.3		ng/L		108	75 - 135
F-53B Minor	37.8	39.0		ng/L		103	54 - 114
4:2 FTS	37.5	40.9		ng/L		109	79 - 139
6:2 FTS	38.1	37.0		ng/L		97	59 - 175
8:2 FTS	38.4	39.2		ng/L		102	75 - 135
HFPO-DA (GenX)	40.0	41.8		ng/L		105	51 - 173
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)	40.0	40.2		ng/L		100	76 - 136
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)	40.0	40.2		ng/L		101	76 - 136
Perfluorobutanesulfonic acid (PFBS)	35.5	39.5		ng/L		111	67 - 127
Perfluorobutanoic acid (PFBA)	40.0	40.7		ng/L		102	76 - 136
Perfluorodecanesulfonic acid (PFDS)	38.6	41.7		ng/L		108	71 - 131
Perfluorodecanoic acid (PFDA)	40.0	41.7		ng/L		104	76 - 136
Perfluorododecanoic acid (PFDoA)	40.0	41.4		ng/L		104	71 - 131
Perfluoroheptanesulfonic acid (PFHpS)	38.2	44.1		ng/L		116	76 - 136
Perfluoroheptanoic acid (PFHpA)	40.0	41.5		ng/L		104	72 - 132
Perfluorohexanesulfonic acid (PFHxS)	36.5	36.5		ng/L		100	59 - 119
Perfluorohexanoic acid (PFHxA)	40.0	40.5		ng/L		101	73 - 133
Perfluorononanesulfonic acid (PFNS)	38.5	43.5		ng/L		113	75 - 135
Perfluorononanoic acid (PFNA)	40.0	43.3		ng/L		108	75 - 135
Perfluorooctanesulfonamide (FOSA)	40.0	39.9		ng/L		100	73 - 133
Perfluorooctanesulfonic acid (PFOS)	37.2	39.2		ng/L		105	70 - 130
Perfluorooctanoic acid (PFOA)	40.0	41.5		ng/L		104	70 - 130
Perfluoropentanesulfonic acid (PFPeS)	37.5	42.1		ng/L		112	66 - 126
Perfluoropentanoic acid (PFPeA)	40.0	47.9		ng/L		120	71 - 131
Perfluorotetradecanoic acid (PFTeA)	40.0	41.9		ng/L		105	70 - 130
Perfluorotridecanoic acid (PFTriA)	40.0	37.7		ng/L		94	71 - 131

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

Lab Sample ID: LCS 320-604447/2-A
Matrix: Water
Analysis Batch: 604935

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 604447

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Perfluoroundecanoic acid (PFUnA)			40.0	39.2		ng/L		98	68 - 128		

Isotope Dilution	*LCS %Recovery*	*LCS Qualifier*	*Limits*
13C8 FOSA	*88*		*25 - 150*
13C3 HFPO-DA	*87*		*25 - 150*
13C4 PFBA	*88*		*25 - 150*
13C3 PFBS	*82*		*25 - 150*
13C2 PFDA	*90*		*25 - 150*
13C2 PFDoA	*91*		*25 - 150*
13C4 PFHpA	*95*		*25 - 150*
13C2 PFHxA	*92*		*25 - 150*
13C5 PFNA	*93*		*25 - 150*
13C4 PFOA	*95*		*25 - 150*
13C4 PFOS	*89*		*25 - 150*
13C5 PFPeA	*77*		*25 - 150*
13C2 PFTeDA	*77*		*25 - 150*
13C2 PFUnA	*101*		*25 - 150*
d5-NEtFOSAA	*109*		*25 - 150*
d3-NMeFOSAA	*108*		*25 - 150*
M2-4:2 FTS	*83*		*25 - 150*
M2-6:2 FTS	*92*		*25 - 150*
M2-8:2 FTS	*93*		*25 - 150*
18O2 PFHxS	*92*		*25 - 150*

Lab Sample ID: LCSD 320-604447/3-A
Matrix: Water
Analysis Batch: 604935

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 604447

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
4,8-Dioxa-3H-perfluorononanoic acid (ADONA)			37.8	38.4		ng/L		102	79 - 139	11	30
F-53B Major			37.4	36.4		ng/L		98	75 - 135	10	30
F-53B Minor			37.8	33.9		ng/L		90	54 - 114	14	30
4:2 FTS			37.5	41.1		ng/L		110	79 - 139	0	30
6:2 FTS			38.1	37.2		ng/L		98	59 - 175	1	30
8:2 FTS			38.4	40.0		ng/L		104	75 - 135	2	30
HFPO-DA (GenX)			40.0	37.6		ng/L		94	51 - 173	11	30
N-ethylperfluorooctanesulfonamidoacetic acid (NEtFOSAA)			40.0	39.6		ng/L		99	76 - 136	1	30
N-methylperfluorooctanesulfonamidoacetic acid (NMeFOSAA)			40.0	34.9		ng/L		87	76 - 136	14	30
Perfluorobutanesulfonic acid (PFBS)			35.5	34.1		ng/L		96	67 - 127	15	30
Perfluorobutanoic acid (PFBA)			40.0	40.7		ng/L		102	76 - 136	0	30
Perfluorodecanesulfonic acid (PFDS)			38.6	36.7		ng/L		95	71 - 131	13	30
Perfluorodecanoic acid (PFDA)			40.0	39.5		ng/L		99	76 - 136	5	30
Perfluorododecanoic acid (PFDoA)			40.0	40.0		ng/L		100	71 - 131	3	30

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

Lab Sample ID: LCSD 320-604447/3-A
Client Sample ID: Lab Control Sample Dup
Matrix: Water
Prep Type: Total/NA
Analysis Batch: 604935
Prep Batch: 604447

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Perfluoroheptanesulfonic acid (PFHpS)			38.2	37.4		ng/L		98	76 - 136	16	30
Perfluoroheptanoic acid (PFHpA)			40.0	38.4		ng/L		96	72 - 132	8	30
Perfluorohexanesulfonic acid (PFHxS)			36.5	35.9		ng/L		99	59 - 119	2	30
Perfluorohexanoic acid (PFHxA)			40.0	38.7		ng/L		97	73 - 133	4	30
Perfluorononanesulfonic acid (PFNS)			38.5	39.8		ng/L		103	75 - 135	9	30
Perfluorononanoic acid (PFNA)			40.0	40.7		ng/L		102	75 - 135	6	30
Perfluorooctanesulfonamide (FOSA)			40.0	38.6		ng/L		97	73 - 133	3	30
Perfluorooctanesulfonic acid (PFOS)			37.2	36.5		ng/L		98	70 - 130	7	30
Perfluorooctanoic acid (PFOA)			40.0	39.6		ng/L		99	70 - 130	5	30
Perfluoropentanesulfonic acid (PFPeS)			37.5	38.6		ng/L		103	66 - 126	9	30
Perfluoropentanoic acid (PFPeA)			40.0	40.0		ng/L		100	71 - 131	18	30
Perfluorotetradecanoic acid (PFTeA)			40.0	37.0		ng/L		93	70 - 130	12	30
Perfluorotridecanoic acid (PFTriA)			40.0	34.9		ng/L		87	71 - 131	8	30
Perfluoroundecanoic acid (PFUnA)			40.0	37.1		ng/L		93	68 - 128	6	30

Isotope Dilution	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
13C8 FOSA	*101*		*25 - 150*
13C3 HFPO-DA	*101*		*25 - 150*
13C4 PFBA	*89*		*25 - 150*
13C3 PFBS	*97*		*25 - 150*
13C2 PFDA	*100*		*25 - 150*
13C2 PFDoA	*99*		*25 - 150*
13C4 PFHpA	*104*		*25 - 150*
13C2 PFHxA	*94*		*25 - 150*
13C5 PFNA	*102*		*25 - 150*
13C4 PFOA	*100*		*25 - 150*
13C4 PFOS	*99*		*25 - 150*
13C5 PFPeA	*92*		*25 - 150*
13C2 PFTeDA	*89*		*25 - 150*
13C2 PFUnA	*105*		*25 - 150*
d5-NEtFOSAA	*114*		*25 - 150*
d3-NMeFOSAA	*118*		*25 - 150*
M2-4:2 FTS	*87*		*25 - 150*
M2-6:2 FTS	*97*		*25 - 150*
M2-8:2 FTS	*89*		*25 - 150*
18O2 PFHxS	*101*		*25 - 150*

Isotope Dilution Summary

Client: City of Flint
Job ID: 190-29194-1
Project/Site: Plant Influent/ Final Effluent 2022-07-14-D

Method: 537 (modified) - Fluorinated Alkyl Substances

Matrix: Water **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)
190-29194-1	Northwest Pump Station	127	132	116	133	136	115	141	162 *5+
190-29194-2	East Pump Station	63	80	56	72	73	51	90	87
190-29194-3	Third Avenue Pump Station	58	82	43	66	77	49	93	90
190-29194-4	Microstainer Bypass	91	95	68	75	91	77	100	98
LCS 320-604447/2-A	Lab Control Sample	88	87	88	82	90	91	95	92
LCSD 320-604447/3-A	Lab Control Sample Dup	101	101	89	97	100	99	104	94
MB 320-604447/1-A	Method Blank	100	96	92	86	98	96	96	98

		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)
190-29194-1	Northwest Pump Station	151 *5+	77	127	132	104	146	155 *5+	137
190-29194-2	East Pump Station	80	87	77	66	39	64	38	40
190-29194-3	Third Avenue Pump Station	84	90	71	62	34	68	47	41
190-29194-4	Microstainer Bypass	97	98	87	59	54	89	95	92
LCS 320-604447/2-A	Lab Control Sample	93	95	89	77	77	101	109	108
LCSD 320-604447/3-A	Lab Control Sample Dup	102	100	99	92	89	105	114	118
MB 320-604447/1-A	Method Blank	103	97	97	92	84	109	116	111

		Percent Isotope Dilution Recovery (Acceptance Limits)			
		M242FTS	M262FTS	M282FTS	PFHxS
Lab Sample ID	Client Sample ID	(25-150)	(25-150)	(25-150)	(25-150)
190-29194-1	Northwest Pump Station	162 *5+	98	177 *5+	125
190-29194-2	East Pump Station	95	107	64	83
190-29194-3	Third Avenue Pump Station	101	153 *5+	123	85
190-29194-4	Microstainer Bypass	107	114	90	98
LCS 320-604447/2-A	Lab Control Sample	83	92	93	92
LCSD 320-604447/3-A	Lab Control Sample Dup	87	97	89	101
MB 320-604447/1-A	Method Blank	86	100	94	96

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

QC Association Summary

Client: City of Flint
Job ID: 190-29194-1
Project/Site: Plant Influent/ Final Effluent 2022-07-14-D

LCMS

Prep Batch: 604447

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
190-29194-1	Northwest Pump Station	Total/NA	Water	3535	
190-29194-2	East Pump Station	Total/NA	Water	3535	
190-29194-3	Third Avenue Pump Station	Total/NA	Water	3535	
190-29194-4	Microstainer Bypass	Total/NA	Water	3535	
MB 320-604447/1-A	Method Blank	Total/NA	Water	3535	
LCS 320-604447/2-A	Lab Control Sample	Total/NA	Water	3535	
LCSD 320-604447/3-A	Lab Control Sample Dup	Total/NA	Water	3535	

Analysis Batch: 604935

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
190-29194-1	Northwest Pump Station	Total/NA	Water	537 (modified)	604447
190-29194-2	East Pump Station	Total/NA	Water	537 (modified)	604447
190-29194-3	Third Avenue Pump Station	Total/NA	Water	537 (modified)	604447
190-29194-4	Microstainer Bypass	Total/NA	Water	537 (modified)	604447
MB 320-604447/1-A	Method Blank	Total/NA	Water	537 (modified)	604447
LCS 320-604447/2-A	Lab Control Sample	Total/NA	Water	537 (modified)	604447
LCSD 320-604447/3-A	Lab Control Sample Dup	Total/NA	Water	537 (modified)	604447

Lab Chronicle

Client: City of Flint
Job ID: 190-29194-1
Project/Site: Plant Influent/ Final Effluent 2022-07-14-D

Client Sample ID: Northwest Pump Station
Lab Sample ID: 190-29194-1
Date Collected: 07/12/22 11:14
Matrix: Water
Date Received: 07/14/22 15:37

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			604447	07/20/22 19:07	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1	604935	07/23/22 01:50	S1M	TAL SAC

Client Sample ID: East Pump Station
Lab Sample ID: 190-29194-2
Date Collected: 07/12/22 10:24
Matrix: Water
Date Received: 07/14/22 15:37

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			604447	07/20/22 19:07	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1	604935	07/23/22 02:00	S1M	TAL SAC

Client Sample ID: Third Avenue Pump Station
Lab Sample ID: 190-29194-3
Date Collected: 07/12/22 10:49
Matrix: Water
Date Received: 07/14/22 15:37

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			604447	07/20/22 19:07	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1	604935	07/23/22 02:10	S1M	TAL SAC

Client Sample ID: Microstainer Bypass
Lab Sample ID: 190-29194-4
Date Collected: 07/12/22 11:22
Matrix: Water
Date Received: 07/14/22 15:37

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3535			604447	07/20/22 19:07	PV	TAL SAC
Total/NA	Analysis	537 (modified)		1	604935	07/23/22 02:41	S1M	TAL SAC

Laboratory References:

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

Analyst References:

Lab: TAL SAC

Batch Type: Prep

PV = Pheng Vue

Batch Type: Analysis

S1M = Sudarat Mongkol

Method Summary

Client: City of Flint
Job ID: 190-29194-1
Project/Site: Plant Influent/ Final Effluent 2022-07-14-D

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL SAC
3535	Solid-Phase Extraction (SPE)	SW846	TAL SAC

Protocol References:

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 Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600

Definitions/Glossary

Client: City of Flint
Job ID: 190-29194-1
Project/Site: Plant Influent/ Final Effluent 2022-07-14-D

Qualifiers

LCMS

Qualifier	Qualifier Description
*5+	Isotope dilution analyte is outside acceptance limits, high biased.
I	Value is EMPC (estimated maximum possible concentration).

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

CITY OF FLINT WATER POLLUTION CONTROL FACILITIES
ENVIRONMENTAL LABORATORY SERVICES SHIPPER/RECEIVER

PROJECT NUMBER: 2022-07-14-D | **PURCHASE ORDER: 23-004771** | **PROJECT NAME: Flint WPCF Contract Environmental Monitoring Services**

QTY	SAMPLE					SAMPLING LOCATION	NUMBER OF CONTAINERS	ANALYTICAL PARAMETERS	PRICE	
	NUMBER	DATE	TIME	TYPE	MEDIUM				UNIT	EXTENDED
1		07/12/22	11:14 a.m.	Grab	Plant Influent	Northwest Pump Station	2, 250-ml HDPE bottles	PFAS, Standard List (28 Analytes) by EPA Modified Method 537	$265.00	$265.00
1		07/12/22	10:24 a.m.	Grab	Plant Influent	East Pump Station	2, 250-ml HDPE bottles	PFAS, Standard List (28 Analytes) by EPA Modified Method 537	$265.00	$265.00
1		07/12/22	10:49 a.m.	Grab	Plant Influent	Third Avenue Pump Station	2, 250-ml HDPE bottles	PFAS, Standard List (28 Analytes) by EPA Modified Method 537	$265.00	$265.00
1		07/12/22	11:22 a.m.	Grab	Final Effluent	Microstrainer Bypass	2, 250-ml HDPE bottles	PFAS, Standard List (28 Analytes) by EPA Modified Method 537	$265.00	$265.00
									TOTAL PRICE	**$1060.00**

SAMPLE CONDITION:			**SAMPLE LOCATION:**		
RELINQUISHED BY:	**DATE:** 07/14/22	**TIME:** 11:48	**RECEIVED BY:**	**DATE:** 7/14/22	**TIME:** 15:37
RECEIVED BY:	**DATE:** 07/14/22	**TIME:** 1150	**RELINQUISHED BY:**	**DATE:**	**TIME:**
RELINQUISHED BY:	**DATE:** 7/14/22	**TIME:** 1200	**RECEIVED BY:**	**DATE:**	**TIME:**

SPECIAL REQUESTS:

REPORT TO: Eric Brubaker, Laboratory Supervisor, Water Pollution Control Facilities, G-4652 Beecher Rd., Flint, MI 48532; 810-230-3152 (phone) and 810-230-3154 (fax).

QC report audited by _____ on _____. Invoice checked and forwarded by _____ on _____. Data entered by _____ on _____.

eurofins | Environment Testing TestAmerica

☐ SDS or Known Hazard Information Supplied by Client
☐ Discrepancies
☐ Short Hold
☐ Rush ☐ 24 Hr ☐ 2-Day ☐ 3-Day ☐ 5-Day ☐ Other: _____

Client ID: City of Flint
Work Oder #: 29194
Receipt Evaluation Performed by: Initials: JH Date: 7/14 Time: 15:37

Cooler / Sample Receipt

After hours receipt: complete gray areas. Place cooler in walk-in, place form in Receiving box. Date: _____ Time: _____

Method of Shipment:
Walk-In Client Eurofins TA Field/Courier
Other Client / 3rd Party Courier: _____
Fed Ex Tracking #: _____
UPS Tracking #: _____
Other: _____

Shipping Container Type:
☑ Cooler ☐ Box
☐ None ☐ Other: _____

Packing Materials:
☑ Plastic Bags ☐ Foam
☐ Bubble Wrap ☐ Paper
☐ Packing Peanuts ☐ None
☐ Other: _____

Custody Seals Intact:
☐ Yes ☐ No
☒ NA (not used or required)

Cooling Materials:
☑ Ice (Solid) ☐ Ice (Melted)
☐ Blue Ice ☐ None
☐ Other: _____

Bacteriological Samples	Temp Corrected (°C)	Frozen? Yes	Frozen? No	Rec'd Within 2 Hrs? Yes	Rec'd Within 2 Hrs? No	Sample Flagged? Yes	Sample Flagged? No

Received on same day sampled? Yes (No) Additional Sheets Required? Yes (No)

Receipt Temperatures

Thermometer ID	Observed (°C)	Corrected (°C)	Temp Blank	Sample Temp	Acceptable	Cooler ID	Affected Samples
CP313207	5.5	5.5		✓	✓Y _N		
					_Y _N		
					_Y _N		

Receipt Questions**	Y	N	NA	"No" answers require additional comment
CoC present and ETA receipt signature, date, and time properly documented?	✓			
Containers and Labels in good condition? *(unbroken, not leaking, appropriately filled, labels legible & attached)*	✓			
Appropriate containers used and adequate volume provided?	✓			Preserved bottles checked for pH?* Yes (No)
Number of sample containers match CoC?	✓			pH strip lot # _____
Samples received within hold?	✓			
Samples submitted for GRO and Volatiles analysis (8260, 624, 524) received without headspace?	✓		✓	
Was a Trip Blank received with VOA samples?	✓		✓	
Were the samples free of any questionable physical conformities? (i.e.; field duplicates or multiple bottles of the same sample do not significantly vary in appearance – color, solid proportions, etc.)	✓			
Were the CoC bottle labels and all other items free of all other discrepancies or issues that would need to be addressed with the Project Manager and/or Client?	✓			
**May not be applicable if samples are not for compliance testing				*Excludes FOG, VOAs, TOC Vials, HEM

Client Contact Record
Contact Via: ☐ Phone ☐ Email ☐ Other: _____ Person Contacted: _____ Date/Time: _____
☐ Discrepancy allowance agreement is on record in the client project file
Discussion / Resolution

Any additional documentation and clarification from the client must be noted in the narrative and/or scanned into the CoC directory.
Reviewed by _____ Date: 7/14/22

WI-MI-010_020720

Eurofins Michigan
10448 Citation Drive Suite 200
Brighton, MI 48116
Phone: 810-229-2763 Fax: 810-229-0000

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Schafer, Sue	Carrier Tracking No(s):	COC No: 190-33276.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Sue.Schafer@et.eurofinsus.com	State of Origin: Michigan	Page: Page 1 of 1
Company: Eurofins Environment Testing Northern Ca		Accreditations Required (See note):		Job #: 190-29194-1
Address: 880 Riverside Parkway,	Due Date Requested: 7/27/2022			
City: West Sacramento	TAT Requested (days):			
State, Zip: CA, 95605				
Phone: 916-373-5600(Tel) 916-372-1059(Fax)	PO #:			
Email:	WO #:			
Project Name: Plant Influent/ Final Effluent 2022-07-14-D	Project #: 19000078			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, 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)	PFC_IDA/3535_PFC PFAS 28	Total Number of containers	Special Instructions/Note:
			Preservation Code:						
Northwest Pump Station (190-29194-1)	7/12/22	11:14 Eastern		Water			X	2	
East Pump Station (190-29194-2)	7/12/22	10:24 Eastern		Water			X	2	
Third Avenue Pump Station (190-29194-3)	7/12/22	10:49 Eastern		Water			X	2	
Microstainer Bypass (190-29194-4)	7/12/22	11:22 Eastern		Water			X	2	

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central, LLC 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 Environment Testing North Central, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing North Central, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said complicance to Eurofins Environment Testing North Central, LLC.

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:

	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
1	[signature]	7/14/22 1545	EETA	[signature]	7-15-22 0940	ECTSM
2	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
3	Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact:	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:
Δ Yes Δ No	1794884	2.4

Ver: 06/08/2021

Method Summary

Client: City of Flint
Job ID: 190-29194-1
Project/Site: Plant Influent/ Final Effluent 2022-07-14-D

Method	Method Description	Protocol	Laboratory
537 (modified)	Fluorinated Alkyl Substances	EPA	TAL SAC
3535	Solid-Phase Extraction (SPE)	SW846	TAL SAC

Protocol References:

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 Sacramento, 880 Riverside Parkway, West Sacramento, CA 95605, TEL (916)373-5600