

SUBJECT
RACER Buick City Sanitary PFAS Update

TO
Grant Trigger, RACER Trust

DATE
June 28, 2021

PROJECT NUMBER
30075935

COPIES TO
Chris Peters, Arcadis
Micki Maki, Arcadis

NAME
Tony Maffeo

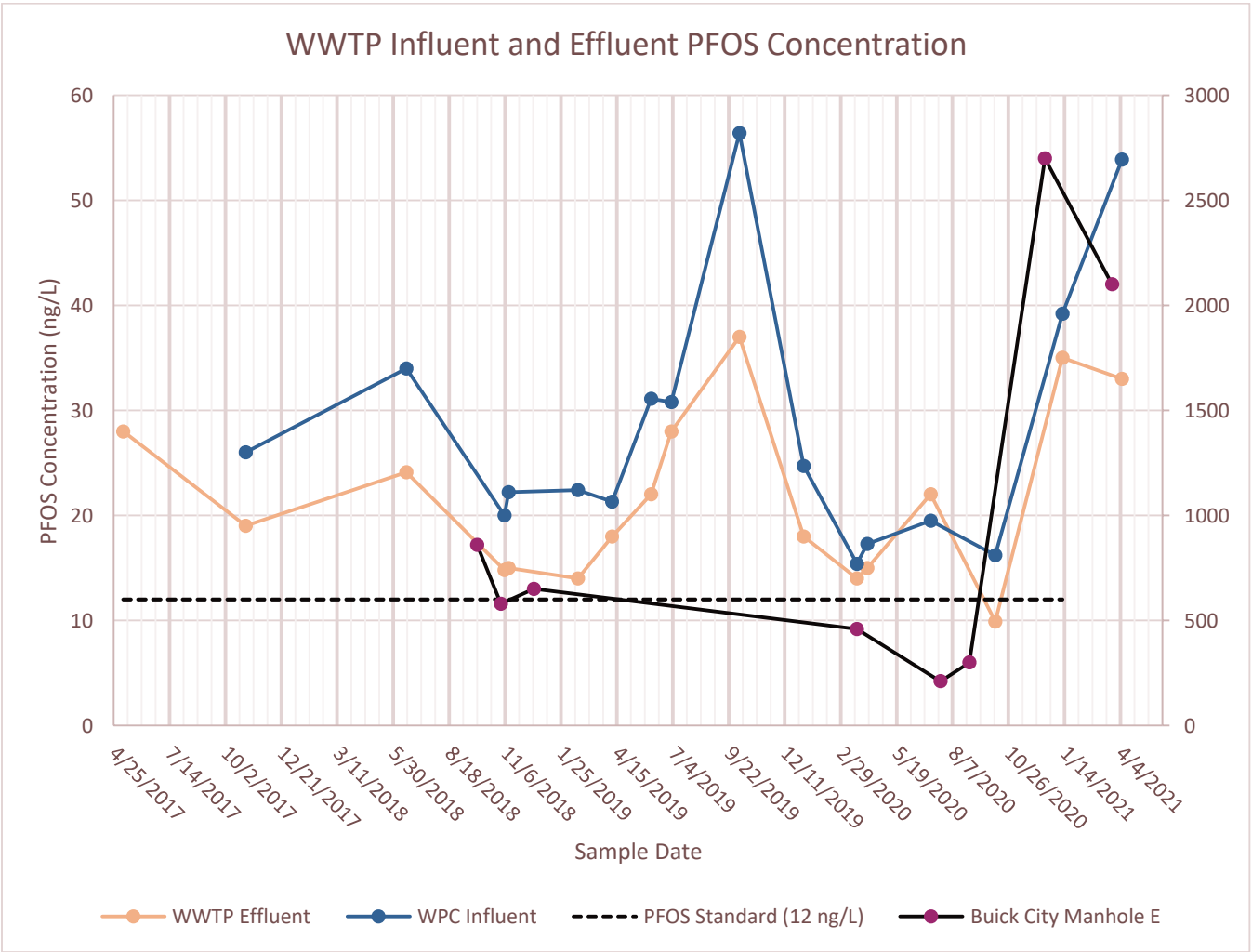
This memo summarizes the recent activities related to the Hamilton Avenue sanitary sewer at the RACER Buick City Site (Site) located in Flint, Michigan. In an attempt to assess the benefits of blocking portions of the abandoned sanitary sewers in the vicinity of Hamilton Avenue and the amount of PFOS entering the City of Flint sanitary sewer system a series of samples were collected to over the past 3 months. Thirteen samples collected from the sanitary sewer on March 23, April 6, April 21, and May 25 of 2021 are shown on Figure 1 and included in Table 1.

- Three samples were collected from Manholes MH E, MH E-1, and MH H-1A on March 23, 2021.
- Three samples were collected from Manholes MH E, MH E-1, and MH H-1A on April 6, 2021.
- Three samples were collected from Manholes MH E, MH E-1, and MH H-1A on April 21, 2021.
- Four samples were collected from Manholes MH E, MH E-1, MH H-1A, and MH H-1 on May 25, 2021, following installation of a temporary plugs.

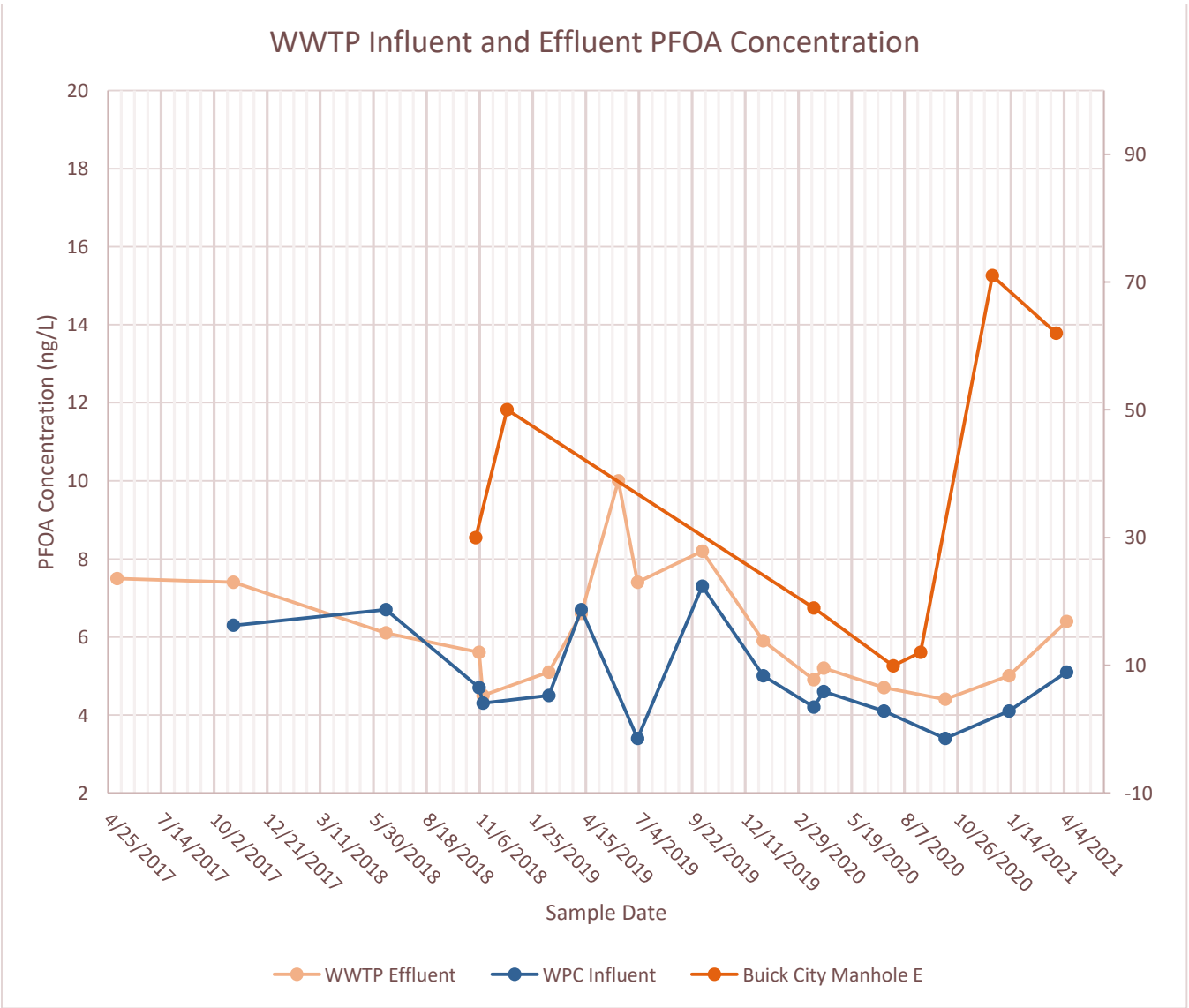
Trend curves (displayed below) were also prepared to evaluate the relationship between the PFOS and PFOA levels in the Hamilton Avenue sanitary sewer and levels of PFOS and PFOA received at the City of Flint WWTP. Based on limited data the results are inconclusive through the end of 2019. However, the peak PFOS concentration at Manhole E-1 in December 2020 coincides with the highest levels of PFOS detected at the WWTP in January 2021. On the other hand, a substantial increase in PFOA at Manhole E-1 in January 2021 did not appear to materially impact the levels of PFOA at the City of Flint WWTP. With respect to PFOS although other sources of PFOS cannot be discounted a reduction in PFOS levels in the Hamilton Avenue sanitary sewer is expected to improve the City WWTP performance.

RACER had previously installed a temporary plug to block the sanitary sewer at Manhole E-1 on July 14, 2020. This resulted in a drop in PFOS concentrations at Manhole E followed by an apparent reduction at the City of Flint WWTP. On December 14, 2020, groundwater began daylighting at the surface onsite north of Hamilton Avenue. In an attempt to respond to the daylighting issue, the plug in the sanitary sewer was removed resulting in a significant increase of PFOS released into the City sanitary sewer system as sampled on January 11, 2021. RACER implemented additional measures onsite to prevent the daylighting issue including filling 22 manholes including Manhole 10-5 (storm sewer) onsite manholes with concrete.

New temporary plugs were installed in manholes MH H-1 and MH H-1A on May 6, 2021 and will remain in place through November 2021 to better understand where the PFAS is coming from and to confirm the daylighting issue is resolved and that PFOS releases into the City sanitary sewer have been reduced. If this yields a positive result a permanent bulkhead will be installed.



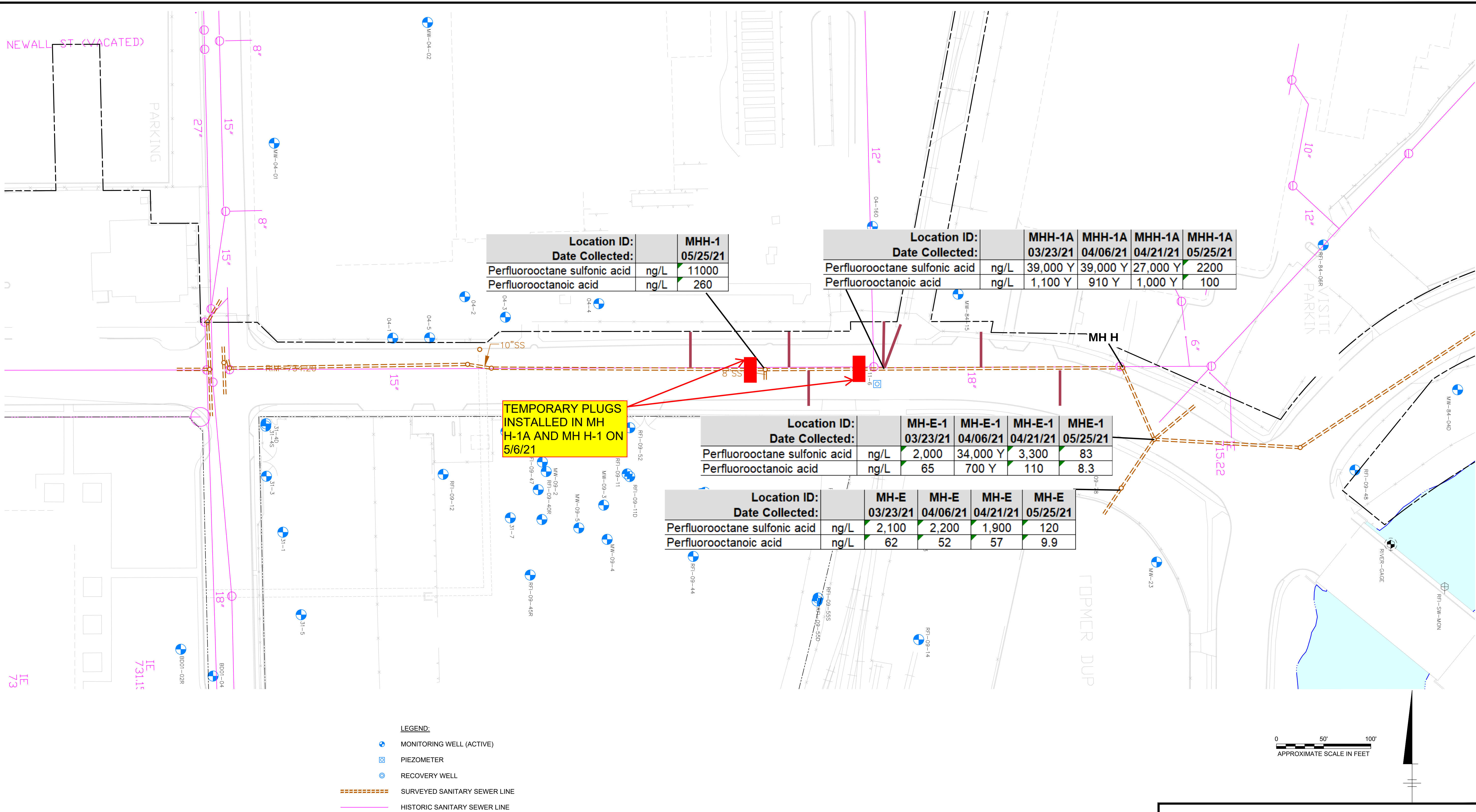
Note: Data from Buick City Manhole E is scaled on the right Y-axis



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

Figures

CITY: SYRACUSE DIV/GROUP: ENV DB: A SANCHEZ ID: ALS/GMS PIC: C S PETERS PM: C KIKER TM: C KIKER LVR: ON=OFF=REF
C:\Users\lsanchez\OneDrive - ARCADIS\BIM 360 Docs\RACER TRUST\BUICK CITY RCRA2019\DWG\RBC-F-HAMILTON SANITARY SEWER.dwg LAYOUT: 3 SAVED: 1/7/2019 5:39 PM ACADVER: 21.08 (LMS TECH) PAGES: 10 PLOTSTYLE: PLT1.dwg PLOTTED: 1/7/2019 6:09 PM BY: SANCHEZ, ADRIAN



RACER TRUST
BUICK CITY
FLINT, MICHIGAN

**HAMILTON AVENUE SANITARY SEWER
DATA FROM 3/23/21 THROUGH 5/25/21**

Table

Location ID: Date Collected:		MH-E 03/23/21	MH-E 04/06/21	MH-E 04/21/21	MH-E 05/25/21	MH-E-1 03/23/21
PFAS						
11CI-PF3OUdS (F-53B Minor)	ng/L	9.9 U	2 U	2 U	2 U	11 U
4:2 FTS	ng/L	9.9 U	2 U	2 U	2 U	11 U
6:2FTS	ng/L	9.9 U	2 U	2 U	4.1 U	11 U
8:2FTS	ng/L	9.9 U	2 U	2 U	2 U	11 U
9CI-PF3ONS (F-53B Major)	ng/L	9.9 U	2 U	2 U	2 U	11 U
ADONA	ng/L	9.9 U	2 U	2 U	2 U	11 U
HFPO-DA (GenX)	ng/L	9.9 U	2 U	2 U	10 U	11 U
N-ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	ng/L	9.9 U	4 U	4 U	4.1 U	11 U
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	ng/L	9.9 U	2 U	2 U	2 U	11 U
Perfluorobutanesulfonic acid (PFBS)	ng/L	41	41	41	19	48
Perfluorobutanoic acid (PFBA)	ng/L	20 U	15	18	18	22 U
Perfluorodecanesulfonic acid (PFDS)	ng/L	9.9 U	2 U	2 U	2 U	11 U
Perfluorodecanoic acid (PFDA)	ng/L	9.9 U	2 U	2 U	2 U	11 U
Perfluorododecanoic acid (PFDoDA)	ng/L	9.9 U	2 U	2 U	2 U	11 U
Perfluoroheptanesulfonic Acid (PFHpS)	ng/L	39	38	43	2 U	40
Perfluoroheptanoic acid (PFHpA)	ng/L	18	15	17	5.1	23
Perfluorohexanesulfonic acid (PFHxS)	ng/L	690	660	700	61	790
Perfluorohexanoic acid (PFHxA)	ng/L	100	90	91	15	110
Perfluorononanesulfonic acid (PFNS)	ng/L	9.9 U	2 U	2 U	2 U	11 U
Perfluorononanoic acid (PFNA)	ng/L	9.9 U	3.4	4.5	4.1	11 U
Perfluorooctane Sulfonamide (FOSA)	ng/L	9.9 U	2 U	2 U	2 U	11 U
Perfluorooctane sulfonic acid (PFOS)	ng/L	2,100	2,200	1,900	120	2,000
Perfluorooctanoic acid (PFOA)	ng/L	62	52	57	9.9	65
Perfluoropentanesulfonic acid (PFPeS)	ng/L	63	56	56	14	68
Perfluoropentanoic acid (PFPeA)	ng/L	24	21	25	8.8	26
Perfluorotetradecanoic acid (PFTeDA)	ng/L	9.9 U	4 U	4 U	4.1 U	11 U
Perfluorotridecanoic Acid (PFTrDA)	ng/L	9.9 U	2 U	2 U	2 U	11 U
Perfluoroundecanoic acid (PFUnDA)	ng/L	9.9 U	2 U	2 U	2 U	11 U
PFHxS-BR	ng/L	110	100	110	11	120
PFHxS-LN	ng/L	580	560	600	50	670
PFOS-BR	ng/L	960	990	810	47	910
PFOS-LN	ng/L	1,100	1,200	1,100	74	1,100

Location ID: Date Collected:		MH-E-1 04/06/21	MH-E-1 04/21/21	MH-E-1 05/25/21	MHH-1A 03/23/21
PFAS					
11CI-PF3OUdS (F-53B Minor)	ng/L	10 UY	2.1 U	2 U	51 UY
4:2 FTS	ng/L	10 UY	2.1 U	2 U	51 UY
6:2FTS	ng/L	10 UY	2.1 U	3.9 U	51 UY
8:2FTS	ng/L	10 UY	2.1 U	2 U	51 UY
9CI-PF3ONS (F-53B Major)	ng/L	10 UY	2.1 U	2 U	51 UY
ADONA	ng/L	10 UY	2.1 U	2 U	51 UY
HFPO-DA (GenX)	ng/L	10 UY	2.1 U	9.8 U	51 UY
N-ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	ng/L	20 UY	4.3 U	3.9 U	51 UY
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	ng/L	10 UY	2.1 U	2 U	51 UY
Perfluorobutanesulfonic acid (PFBS)	ng/L	380 Y	60	14	620 Y
Perfluorobutanoic acid (PFBA)	ng/L	100 Y	23	20 UY	170 Y
Perfluorodecanesulfonic acid (PFDS)	ng/L	10 UY	2.1 U	2 U	51 UY
Perfluorodecanoic acid (PFDA)	ng/L	16 Y	2.1 U	2 U	51 UY
Perfluorododecanoic acid (PFDoDA)	ng/L	10 UY	2.1 U	2 U	51 UY
Perfluoroheptanesulfonic Acid (PFHpS)	ng/L	480 Y	71	2.0	810 Y
Perfluoroheptanoic acid (PFHpA)	ng/L	200 Y	31	4.2	350 Y
Perfluorohexanesulfonic acid (PFHxS)	ng/L	8,600 Y	1,300	48	15,000 Y
Perfluorohexanoic acid (PFHxA)	ng/L	1,300 Y	170	11	1,900 Y
Perfluorononanesulfonic acid (PFNS)	ng/L	10 UY	2.1 U	2 U	51 UY
Perfluorononanoic acid (PFNA)	ng/L	19 Y	5.6	3.2	51 UY
Perfluorooctane Sulfonamide (FOSA)	ng/L	10 UY	2.1 U	2 U	51 UY
Perfluorooctane sulfonic acid (PFOS)	ng/L	34,000 Y	3,300	83	39,000 Y
Perfluorooctanoic acid (PFOA)	ng/L	700 Y	110	8.3	1,100 Y
Perfluoropentanesulfonic acid (PFPeS)	ng/L	680 Y	85	11	1,200 Y
Perfluoropentanoic acid (PFPeA)	ng/L	220 Y	35	6.7	340 Y
Perfluorotetradecanoic acid (PFTeDA)	ng/L	20 UY	4.3 U	3.9 U	51 UY
Perfluorotridecanoic Acid (PFTTrDA)	ng/L	10 UY	2.1 U	2 U	51 UY
Perfluoroundecanoic acid (PFUnDA)	ng/L	10 UY	2.1 U	2 U	51 UY
PFHxS-BR	ng/L	1,300 Y	190	8.6	2,200 Y
PFHxS-LN	ng/L	7,300 Y	1,100	39	13,000 Y
PFOS-BR	ng/L	15,000 Y	1,400	47	18,000 Y
PFOS-LN	ng/L	19,000 Y	1,900	35	21,000 Y

Location ID: Date Collected:		MHH-1A 04/06/21	MHH-1A 04/21/21	MHH-1A 05/25/21	MHH-1 05/25/21
PFAS					
11CI-PF3OUdS (F-53B Minor)	ng/L	9.9 UY	9.9 UY	2 U	2.1 U
4:2 FTS	ng/L	9.9 UY	9.9 UY	2 U	2.1 U
6:2FTS	ng/L	9.9 UY	9.9 UY	4.1 U	4.1 U
8:2FTS	ng/L	9.9 UY	9.9 UY	2 U	2.1 U
9CI-PF3ONS (F-53B Major)	ng/L	9.9 UY	9.9 UY	2 U	2.1 U
ADONA	ng/L	9.9 UY	9.9 UY	2 U	2.1 U
HFPO-DA (GenX)	ng/L	9.9 UY	9.9 UY	10 U	10 U
N-ethyl perfluorooctane sulfonamidoacetic acid (EtFOSAA)	ng/L	20 UY	20 UY	4.1 U	4.1 U
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	ng/L	9.9 UY	9.9 UY	2 U	2.1 U
Perfluorobutanesulfonic acid (PFBS)	ng/L	480 Y	450 Y	20	89
Perfluorobutanoic acid (PFBA)	ng/L	130 Y	130 Y	26	41
Perfluorodecanesulfonic acid (PFDS)	ng/L	9.9 UY	9.9 UY	2 U	2.1 U
Perfluorodecanoic acid (PFDA)	ng/L	16 Y	15 Y	3.1	8.8
Perfluorododecanoic acid (PFDoDA)	ng/L	9.9 UY	9.9 UY	2 U	2.1 U
Perfluoroheptanesulfonic Acid (PFHpS)	ng/L	620 Y	620 Y	50	220
Perfluoroheptanoic acid (PFHpA)	ng/L	260 Y	270 Y	55	94
Perfluorohexanesulfonic acid (PFHxS)	ng/L	11,000 Y	11,000 Y	800	3300
Perfluorohexanoic acid (PFHxA)	ng/L	1,600 Y	1,600 Y	130	440
Perfluorononanesulfonic acid (PFNS)	ng/L	9.9 UY	9.9 UY	2 U	2.1 U
Perfluorononanoic acid (PFNA)	ng/L	23 Y	28 Y	7.0	14
Perfluorooctane Sulfonamide (FOSA)	ng/L	9.9 UY	9.9 UY	2 U	2.1 U
Perfluorooctane sulfonic acid (PFOS)	ng/L	39,000 Y	27,000 Y	2200	11000
Perfluorooctanoic acid (PFOA)	ng/L	910 Y	1,000 Y	100	260
Perfluoropentanesulfonic acid (PFPeS)	ng/L	900 Y	790 Y	33	180
Perfluoropentanoic acid (PFPeA)	ng/L	270 Y	280 Y	57	90
Perfluorotetradecanoic acid (PFTeDA)	ng/L	20 UY	20 UY	4.1 U	4.1 U
Perfluorotridecanoic Acid (PFTrDA)	ng/L	9.9 UY	9.9 UY	2 U	2.1 U
Perfluoroundecanoic acid (PFUnDA)	ng/L	9.9 UY	9.9 UY	2 U	2.1 U
PFHxS-BR	ng/L	1,800 Y	1,600 Y	1100	530
PFHxS-LN	ng/L	9,600 Y	9,300 Y	1000	2800
PFOS-BR	ng/L	18,000 Y	13,000 Y	100	5200
PFOS-LN	ng/L	22,000 Y	15,000 Y	690	5300

Table
Summary of WSNITS Sample Analytical Results

DRAFT
PRIVILEGED AND CONFIDENTIAL
ATTORNEY WORK PRODUCT

Qualifier Type	Lab Qualifiers	Definition
Inorganic	U	Concentration below method detection limits
Inorganic	UY	Concentration below method detection limits and matrix interference
Inorganic	Y	Matrix interference
Organic	U	Concentration below method detection limits
Organic	UY	Concentration below method detection limits and matrix interference
Organic	Y	Matrix interference

Analytical Reports



Analytical Laboratory Report

Report ID: S24611.01(01)
Generated on 06/10/2021

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

Additional Contacts: Megan Humphrey, Micki Maki, 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 Lavery (johnlavery@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S24611.01-S24611.07
Project: 30075935.03200 / Buick City
Collected Date(s): 05/25/2021
Submitted Date/Time: 05/25/2021 16:30
Sampled by: Donald Richmond
P.O. #: 30075935.03200

Table of Contents

Cover Page (Page 1)
General Report Notes (Page 2)
Report Narrative (Page 2)
Laboratory Certifications (Page 3)
Qualifier Descriptions (Page 3)
Glossary of Abbreviations (Page 3)
Method Summary (Page 4)
Sample Summary (Page 5)

Maya Murshak
Technical Director



Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

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

Qualifier Descriptions

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

Glossary of Abbreviations

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

Method Summary

Method	Version
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
PFTTrDA	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



Analytical Laboratory Report

Sample Summary (7 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S24611.01	Outfall 010_052521	Groundwater	05/25/21 10:00
S24611.02	MHE_052521	Groundwater	05/25/21 10:25
S24611.03	MHE-1_052521	Groundwater	05/25/21 10:45
S24611.04	MHH-1A_052521	Groundwater	05/25/21 11:20
S24611.05	MHH-1_052521	Groundwater	05/25/21 11:45
S24611.06	MH10-2_052521	Groundwater	05/25/21 12:10
S24611.07	MH11-6_052521	Groundwater	05/25/21 12:45



Analytical Laboratory Report

Lab Sample ID: S24611.01

Sample Tag: Outfall 010_052521

Collected Date/Time: 05/25/2021 10:00

Matrix: Groundwater

COC Reference: 146061

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.03/6.83/10	ASTMD7979-19M	05/26/21 10:30	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 05/27/21 22:44, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	26	9.6		ng/L	1.92	375-22-4	
PFPeA*	34	3.8		ng/L	1.92	2706-90-3	
4:2 FTSA*	Not detected	1.9		ng/L	1.92	757124-72-4	
PFHxA*	160	1.9		ng/L	1.92	307-24-4	
PFBS*	78	1.9		ng/L	1.92	375-73-5	
PFHpA*	29	1.9		ng/L	1.92	375-85-9	
PFPeS*	84	1.9		ng/L	1.92	2706-91-4	
6:2 FTSA*	Not detected	3.8		ng/L	1.92	27619-97-2	
PFOA*	91	1.9		ng/L	1.92	335-67-1	
PFHxS*	880	1.9		ng/L	1.92	355-46-4	
PFHxS-LN*	720	1.9		ng/L	1.92	355-46-4-LN	
PFHxS-BR*	160	1.9		ng/L	1.92	355-46-4-BR	
PFNA*	8.9	1.9		ng/L	1.92	375-95-1	
8:2 FTSA*	Not detected	1.9		ng/L	1.92	39108-34-4	
PFHpS*	50	1.9		ng/L	1.92	375-92-8	
PFDA*	2.6	1.9		ng/L	1.92	335-76-2	
N-MeFOSAA*	Not detected	1.9		ng/L	1.92	2355-31-9	
EtFOSAA*	Not detected	3.8		ng/L	1.92	2991-50-6	
PFOS*	2,700	1.9		ng/L	1.92	1763-23-1	
PFOS-LN*	1,200	1.9		ng/L	1.92	1763-23-1-LN	
PFOS-BR*	1,400	1.9		ng/L	1.92	1763-23-1-BR	
PFUnDA*	Not detected	1.9		ng/L	1.92	2058-94-8	
PFNS*	Not detected	1.9		ng/L	1.92	68259-12-1	
PFDODA*	Not detected	1.9		ng/L	1.92	307-55-1	
PFDS*	Not detected	1.9		ng/L	1.92	335-77-3	
PFTDA*	Not detected	1.9		ng/L	1.92	72629-94-8	
FOSA*	Not detected	1.9		ng/L	1.92	754-91-6	
PFTeDA*	Not detected	3.8		ng/L	1.92	376-06-7	
11Cl-PF3OUdS*	Not detected	1.9		ng/L	1.92	763051-92-9	
9Cl-PF3ONS*	Not detected	1.9		ng/L	1.92	756426-58-1	
ADONA*	Not detected	1.9		ng/L	1.92	919005-14-4	
HFPO-DA*	Not detected	9.6		ng/L	1.92	13252-13-6	



Analytical Laboratory Report

Lab Sample ID: S24611.02

Sample Tag: MHE_052521

Collected Date/Time: 05/25/2021 10:25

Matrix: Groundwater

COC Reference: 146061

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.27/6.86/11	ASTMD7979-19M	05/26/21 10:30	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 05/27/21 23:03, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	18	10		ng/L	2.03	375-22-4	
PFPeA*	8.8	4.1		ng/L	2.03	2706-90-3	
4:2 FTSA*	Not detected	2.0		ng/L	2.03	757124-72-4	
PFHxA*	15	2.0		ng/L	2.03	307-24-4	
PFBS*	19	2.0		ng/L	2.03	375-73-5	
PFHpA*	5.1	2.0		ng/L	2.03	375-85-9	
PFPeS*	14	2.0		ng/L	2.03	2706-91-4	
6:2 FTSA*	Not detected	4.1		ng/L	2.03	27619-97-2	
PFOA*	9.9	2.0		ng/L	2.03	335-67-1	
PFHxS*	61	2.0		ng/L	2.03	355-46-4	
PFHxS-LN*	50	2.0		ng/L	2.03	355-46-4-LN	
PFHxS-BR*	11	2.0		ng/L	2.03	355-46-4-BR	
PFNA*	4.1	2.0		ng/L	2.03	375-95-1	
8:2 FTSA*	Not detected	2.0		ng/L	2.03	39108-34-4	
PFHpS*	Not detected	2.0		ng/L	2.03	375-92-8	
PFDA*	Not detected	2.0		ng/L	2.03	335-76-2	
N-MeFOSAA*	Not detected	2.0		ng/L	2.03	2355-31-9	
EtFOSAA*	Not detected	4.1		ng/L	2.03	2991-50-6	
PFOS*	120	2.0		ng/L	2.03	1763-23-1	
PFOS-LN*	74	2.0		ng/L	2.03	1763-23-1-LN	
PFOS-BR*	47	2.0		ng/L	2.03	1763-23-1-BR	
PFUnDA*	Not detected	2.0		ng/L	2.03	2058-94-8	
PFNS*	Not detected	2.0		ng/L	2.03	68259-12-1	
PFDODA*	Not detected	2.0		ng/L	2.03	307-55-1	
PFDS*	Not detected	2.0		ng/L	2.03	335-77-3	
PFTTrDA*	Not detected	2.0		ng/L	2.03	72629-94-8	
FOSA*	Not detected	2.0		ng/L	2.03	754-91-6	
PFTeDA*	Not detected	4.1		ng/L	2.03	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0		ng/L	2.03	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0		ng/L	2.03	756426-58-1	
ADONA*	Not detected	2.0		ng/L	2.03	919005-14-4	
HFPO-DA*	Not detected	10		ng/L	2.03	13252-13-6	



Analytical Laboratory Report

Lab Sample ID: S24611.03

Sample Tag: MHE-1_052521

Collected Date/Time: 05/25/2021 10:45

Matrix: Groundwater

COC Reference: 146061

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	11.92/6.81/10	ASTMD7979-19M	05/26/21 10:30	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 05/27/21 23:23, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	20		ng/L	1.96	375-22-4	X
PFPeA*	6.7	3.9		ng/L	1.96	2706-90-3	
4:2 FTSA*	Not detected	2.0		ng/L	1.96	757124-72-4	
PFHxA*	11	2.0		ng/L	1.96	307-24-4	
PFBS*	14	2.0		ng/L	1.96	375-73-5	
PFHpA*	4.2	2.0		ng/L	1.96	375-85-9	
PFPeS*	11	2.0		ng/L	1.96	2706-91-4	
6:2 FTSA*	Not detected	3.9		ng/L	1.96	27619-97-2	
PFOA*	8.3	2.0		ng/L	1.96	335-67-1	
PFHxS*	48	2.0		ng/L	1.96	355-46-4	
PFHxS-LN*	39	2.0		ng/L	1.96	355-46-4-LN	
PFHxS-BR*	8.6	2.0		ng/L	1.96	355-46-4-BR	
PFNA*	3.2	2.0		ng/L	1.96	375-95-1	
8:2 FTSA*	Not detected	2.0		ng/L	1.96	39108-34-4	
PFHpS*	2.0	2.0		ng/L	1.96	375-92-8	
PFDA*	Not detected	2.0		ng/L	1.96	335-76-2	
N-MeFOSAA*	Not detected	2.0		ng/L	1.96	2355-31-9	
EtFOSAA*	Not detected	3.9		ng/L	1.96	2991-50-6	
PFOS*	83	2.0		ng/L	1.96	1763-23-1	
PFOS-LN*	47	2.0		ng/L	1.96	1763-23-1-LN	
PFOS-BR*	35	2.0		ng/L	1.96	1763-23-1-BR	
PFUnDA*	Not detected	2.0		ng/L	1.96	2058-94-8	
PFNS*	Not detected	2.0		ng/L	1.96	68259-12-1	
PFDODA*	Not detected	2.0		ng/L	1.96	307-55-1	
PFDS*	Not detected	2.0		ng/L	1.96	335-77-3	
PFTDA*	Not detected	2.0		ng/L	1.96	72629-94-8	
FOSA*	Not detected	2.0		ng/L	1.96	754-91-6	
PFTeDA*	Not detected	3.9		ng/L	1.96	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0		ng/L	1.96	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0		ng/L	1.96	756426-58-1	
ADONA*	Not detected	2.0		ng/L	1.96	919005-14-4	
HFPO-DA*	Not detected	9.8		ng/L	1.96	13252-13-6	

X-Elevated reporting limit due to matrix interference



Analytical Laboratory Report

Lab Sample ID: S24611.04

Sample Tag: MHH-1A_052521

Collected Date/Time: 05/25/2021 11:20

Matrix: Groundwater

COC Reference: 146061

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.26/6.84/11	ASTMD7979-19M	05/26/21 10:30	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 05/27/21 23:42, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	26	10		ng/L	2.03	375-22-4	
PFPeA*	57	4.1		ng/L	2.03	2706-90-3	
4:2 FTSA*	Not detected	2.0		ng/L	2.03	757124-72-4	
PFHxA*	130	2.0		ng/L	2.03	307-24-4	
PFBS*	20	2.0		ng/L	2.03	375-73-5	
PFHpA*	55	2.0		ng/L	2.03	375-85-9	
PFPeS*	33	2.0		ng/L	2.03	2706-91-4	
6:2 FTSA*	Not detected	4.1		ng/L	2.03	27619-97-2	
PFOA*	100	2.0		ng/L	2.03	335-67-1	
PFHxS*	800	2.0		ng/L	2.03	355-46-4	
PFHxS-LN*	690	2.0		ng/L	2.03	355-46-4-LN	
PFHxS-BR*	100	2.0		ng/L	2.03	355-46-4-BR	
PFNA*	7.0	2.0		ng/L	2.03	375-95-1	
8:2 FTSA*	Not detected	2.0		ng/L	2.03	39108-34-4	
PFHpS*	50	2.0		ng/L	2.03	375-92-8	
PFDA*	3.1	2.0		ng/L	2.03	335-76-2	
N-MeFOSAA*	Not detected	2.0		ng/L	2.03	2355-31-9	
EtFOSAA*	Not detected	4.1		ng/L	2.03	2991-50-6	
PFOS*	2,200	2.0		ng/L	2.03	1763-23-1	
PFOS-LN*	1,000	2.0		ng/L	2.03	1763-23-1-LN	
PFOS-BR*	1,100	2.0		ng/L	2.03	1763-23-1-BR	
PFUnDA*	Not detected	2.0		ng/L	2.03	2058-94-8	
PFNS*	Not detected	2.0		ng/L	2.03	68259-12-1	
PFDODA*	Not detected	2.0		ng/L	2.03	307-55-1	
PFDS*	Not detected	2.0		ng/L	2.03	335-77-3	
PFTTrDA*	Not detected	2.0		ng/L	2.03	72629-94-8	
FOSA*	Not detected	2.0		ng/L	2.03	754-91-6	
PFTeDA*	Not detected	4.1		ng/L	2.03	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0		ng/L	2.03	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0		ng/L	2.03	756426-58-1	
ADONA*	Not detected	2.0		ng/L	2.03	919005-14-4	
HFPO-DA*	Not detected	10		ng/L	2.03	13252-13-6	



Analytical Laboratory Report

Lab Sample ID: S24611.05

Sample Tag: MHH-1_052521

Collected Date/Time: 05/25/2021 11:45

Matrix: Groundwater

COC Reference: 146061

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.15/6.80/11	ASTMD7979-19M	05/26/21 10:30	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 05/28/21 00:02, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	41	10		ng/L	2.06	375-22-4	
PFPeA*	90	4.1		ng/L	2.06	2706-90-3	
4:2 FTSA*	Not detected	2.1		ng/L	2.06	757124-72-4	
PFHxA*	440	2.1		ng/L	2.06	307-24-4	
PFBS*	89	2.1		ng/L	2.06	375-73-5	
PFHpA*	94	2.1		ng/L	2.06	375-85-9	
PFPeS*	180	2.1		ng/L	2.06	2706-91-4	
6:2 FTSA*	Not detected	4.1		ng/L	2.06	27619-97-2	
PFOA*	260	2.1		ng/L	2.06	335-67-1	
PFHxS*	3,300	2.1		ng/L	2.06	355-46-4	
PFHxS-LN*	2,800	2.1		ng/L	2.06	355-46-4-LN	
PFHxS-BR*	530	2.1		ng/L	2.06	355-46-4-BR	
PFNA*	14	2.1		ng/L	2.06	375-95-1	
8:2 FTSA*	Not detected	2.1		ng/L	2.06	39108-34-4	
PFHpS*	220	2.1		ng/L	2.06	375-92-8	
PFDA*	8.8	2.1		ng/L	2.06	335-76-2	
N-MeFOSAA*	Not detected	2.1		ng/L	2.06	2355-31-9	
EtFOSAA*	Not detected	4.1		ng/L	2.06	2991-50-6	
PFOS*	11,000	2.1		ng/L	2.06	1763-23-1	
PFOS-LN*	5,300	2.1		ng/L	2.06	1763-23-1-LN	
PFOS-BR*	5,200	2.1		ng/L	2.06	1763-23-1-BR	
PFUnDA*	Not detected	2.1		ng/L	2.06	2058-94-8	
PFNS*	Not detected	2.1		ng/L	2.06	68259-12-1	
PFDODA*	Not detected	2.1		ng/L	2.06	307-55-1	
PFDS*	Not detected	2.1		ng/L	2.06	335-77-3	
PFTTrDA*	Not detected	2.1		ng/L	2.06	72629-94-8	
FOSA*	Not detected	2.1		ng/L	2.06	754-91-6	
PFTeDA*	Not detected	4.1		ng/L	2.06	376-06-7	
11Cl-PF3OUdS*	Not detected	2.1		ng/L	2.06	763051-92-9	
9Cl-PF3ONS*	Not detected	2.1		ng/L	2.06	756426-58-1	
ADONA*	Not detected	2.1		ng/L	2.06	919005-14-4	
HFPO-DA*	Not detected	10		ng/L	2.06	13252-13-6	



Analytical Laboratory Report

Lab Sample ID: S24611.06

Sample Tag: MH10-2_052521

Collected Date/Time: 05/25/2021 12:10

Matrix: Groundwater

COC Reference: 146061

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.82/6.83/12	ASTMD7979-19M	05/26/21 10:30	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 05/28/21 09:30, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	18	10		ng/L	2	375-22-4	
PFPeA*	26	4.0		ng/L	2	2706-90-3	
4:2 FTSA*	Not detected	2.0		ng/L	2	757124-72-4	
PFHxA*	62	2.0		ng/L	2	307-24-4	
PFBS*	26	2.0		ng/L	2	375-73-5	
PFHpA*	17	2.0		ng/L	2	375-85-9	
PFPeS*	33	2.0		ng/L	2	2706-91-4	
6:2 FTSA*	Not detected	4.0		ng/L	2	27619-97-2	
PFOA*	33	2.0		ng/L	2	335-67-1	
PFHxS*	290	2.0		ng/L	2	355-46-4	
PFHxS-LN*	240	2.0		ng/L	2	355-46-4-LN	
PFHxS-BR*	53	2.0		ng/L	2	355-46-4-BR	
PFNA*	2.8	2.0		ng/L	2	375-95-1	
8:2 FTSA*	Not detected	2.0		ng/L	2	39108-34-4	
PFHpS*	9.4	2.0		ng/L	2	375-92-8	
PFDA*	Not detected	2.0		ng/L	2	335-76-2	
N-MeFOSAA*	Not detected	2.0		ng/L	2	2355-31-9	
EtFOSAA*	Not detected	4.0		ng/L	2	2991-50-6	
PFOS*	98	2.0		ng/L	2	1763-23-1	
PFOS-LN*	28	2.0		ng/L	2	1763-23-1-LN	
PFOS-BR*	70	2.0		ng/L	2	1763-23-1-BR	
PFUnDA*	Not detected	2.0		ng/L	2	2058-94-8	
PFNS*	Not detected	2.0		ng/L	2	68259-12-1	
PFDODA*	Not detected	2.0		ng/L	2	307-55-1	
PFDS*	Not detected	2.0		ng/L	2	335-77-3	
PFTTrDA*	Not detected	2.0		ng/L	2	72629-94-8	
FOSA*	Not detected	2.0		ng/L	2	754-91-6	
PFTeDA*	Not detected	4.0		ng/L	2	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0		ng/L	2	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0		ng/L	2	756426-58-1	
ADONA*	Not detected	2.0		ng/L	2	919005-14-4	
HFPO-DA*	Not detected	10		ng/L	2	13252-13-6	



Analytical Laboratory Report

Lab Sample ID: S24611.07

Sample Tag: MH11-6_052521

Collected Date/Time: 05/25/2021 12:45

Matrix: Groundwater

COC Reference: 146061

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.14/6.89/10	ASTMD7979-19M	05/26/21 10:30	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 05/28/21 00:41, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	36	9.5		ng/L	1.9	375-22-4	
PFPeA*	83	3.8		ng/L	1.9	2706-90-3	
4:2 FTSA*	Not detected	1.9		ng/L	1.9	757124-72-4	
PFHxA*	400	1.9		ng/L	1.9	307-24-4	
PFBS*	74	1.9		ng/L	1.9	375-73-5	
PFHpA*	71	1.9		ng/L	1.9	375-85-9	
PFPeS*	140	1.9		ng/L	1.9	2706-91-4	
6:2 FTSA*	Not detected	3.8		ng/L	1.9	27619-97-2	
PFOA*	210	1.9		ng/L	1.9	335-67-1	
PFHxS*	2,800	1.9		ng/L	1.9	355-46-4	
PFHxS-LN*	2,400	1.9		ng/L	1.9	355-46-4-LN	
PFHxS-BR*	390	1.9		ng/L	1.9	355-46-4-BR	
PFNA*	13	1.9		ng/L	1.9	375-95-1	
8:2 FTSA*	Not detected	1.9		ng/L	1.9	39108-34-4	
PFHpS*	150	1.9		ng/L	1.9	375-92-8	
PFDA*	7.0	1.9		ng/L	1.9	335-76-2	
N-MeFOSAA*	Not detected	1.9		ng/L	1.9	2355-31-9	
EtFOSAA*	Not detected	3.8		ng/L	1.9	2991-50-6	
PFOS*	9,700	1.9		ng/L	1.9	1763-23-1	
PFOS-LN*	5,100	1.9		ng/L	1.9	1763-23-1-LN	
PFOS-BR*	4,400	1.9		ng/L	1.9	1763-23-1-BR	
PFUnDA*	Not detected	1.9		ng/L	1.9	2058-94-8	
PFNS*	Not detected	1.9		ng/L	1.9	68259-12-1	
PFDODA*	Not detected	1.9		ng/L	1.9	307-55-1	
PFDS*	Not detected	1.9		ng/L	1.9	335-77-3	
PFTTrDA*	Not detected	1.9		ng/L	1.9	72629-94-8	
FOSA*	Not detected	1.9		ng/L	1.9	754-91-6	
PFTeDA*	Not detected	3.8		ng/L	1.9	376-06-7	
11Cl-PF3OUdS*	Not detected	1.9		ng/L	1.9	763051-92-9	
9Cl-PF3ONS*	Not detected	1.9		ng/L	1.9	756426-58-1	
ADONA*	Not detected	1.9		ng/L	1.9	919005-14-4	
HFPO-DA*	Not detected	9.5		ng/L	1.9	13252-13-6	

Merit Laboratories Login Checklist

Lab Set ID:S24611

Client:ARCADIS_NOVI (ARCADIS U.S., Inc.)

Project: 30075935.03200 / Buick City

Submitted:05/25/2021 16:30 Login User: SRS

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.	☒ Yes ☐ No ☐ N/A	Samples are received at 4C +/- 2C Thermometer # IR 4.4
02.	☒ Yes ☐ No ☐ N/A	Received on ice/ cooling process begun
03.	☐ Yes ☒ No ☐ N/A	Samples shipped
04.	☐ Yes ☒ No ☐ N/A	Samples left in 24 hr. drop box
05.	☐ Yes ☐ No ☒ N/A	Are there custody seals/tape or is the drop box locked
Chain of Custody		
06.	☒ Yes ☐ No ☐ N/A	COC adequately filled out
07.	☒ Yes ☐ No ☐ N/A	COC signed and relinquished to the lab
08.	☒ Yes ☐ No ☐ N/A	Sample tag on bottles match COC
09.	☐ Yes ☒ No ☐ N/A	Subcontracting needed? Subcontacted to:
Preservation		
10.	☐ Yes ☐ No ☒ N/A	Do sample have correct chemical preservation
11.	☐ Yes ☐ No ☒ N/A	Completed pH checks on preserved samples? (no VOAs)
12.	☐ Yes ☒ No ☐ N/A	Did any samples need to be preserved in the lab?
Bottle Conditions		
13.	☒ Yes ☐ No ☐ N/A	All bottles intact
14.	☒ Yes ☐ No ☐ N/A	Appropriate analytical bottles are used
15.	☒ Yes ☐ No ☐ N/A	Merit bottles used
16.	☒ Yes ☐ No ☐ N/A	Sufficient sample volume received
17.	☐ Yes ☒ No ☐ N/A	Samples require laboratory filtration
18.	☒ Yes ☐ No ☐ N/A	Samples submitted within holding time
19.	☐ Yes ☐ No ☒ 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: _____

REPORT TO

CHAIN OF CUSTODY RECORD

INVOICE TO

CONTACT NAME Joey Barker			
COMPANY Arcadis			
ADDRESS 28550 Cabot Dr Suite 500			
CITY Navi		STATE MD	ZIP CODE 48337
PHONE NO. 248 790 5218		FAX NO.	P.O. NO.
E-MAIL ADDRESS Joey.Barker@arcadis.com		QUOTE NO.	

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

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

PROJECT NO./NAME 30075935.03200 / Buick City	SAMPLER(S) - PLEASE PRINT/SIGN NAME Donald Richmond / Don Richmond
TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER	
DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER	

Certifications

☐ OHIO VAP ☐ Drinking Water

☐ DoD ☐ NPDES

Project Locations

☐ Detroit ☐ New York

☐ Other _____

Special Instructions

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

Containers & Preservatives

[illegible]

RELINQUISHED BY:	<i>[Signature]</i>	DATE	TIME
SIGNATURE/ORGANIZATION		5/25/21	1530
RECEIVED BY:	<i>[Signature]</i>	DATE	TIME
SIGNATURE/ORGANIZATION		5/25/21	1530
RELINQUISHED BY:	<i>[Signature]</i>	DATE	TIME
SIGNATURE/ORGANIZATION		5/25/21	16:30
RECEIVED BY:	<i>[Signature]</i>	DATE	TIME
SIGNATURE/ORGANIZATION		5/25/21	1630

RELINQUISHED BY:			DATE	TIME
SIGNATURE/ORGANIZATION				
RECEIVED BY:			DATE	TIME
SIGNATURE/ORGANIZATION				
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	NOTES: TEMP. ON ARRIVAL _____ 4.4	
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS		

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



Analytical Laboratory Report

Report ID: S23413.01(01)
Generated on 04/30/2021

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

Additional Contacts: Megan Humphrey, Micki Maki, 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 Lavery (johnlavery@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S23413.01-S23413.10
Project: 30075935.03200 / Arcadis
Collected Date(s): 04/21/2021
Submitted Date/Time: 04/21/2021 16:15
Sampled by: Donald Richmond
P.O. #: 30075935.03200

Table of Contents

Cover Page (Page 1)
General Report Notes (Page 2)
Report Narrative (Page 2)
Laboratory Certifications (Page 3)
Qualifier Descriptions (Page 3)
Glossary of Abbreviations (Page 3)
Method Summary (Page 4)
Sample Summary (Page 5)

Maya Murshak
Technical Director



Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

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

Qualifier Descriptions

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

Glossary of Abbreviations

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

Method Summary

Method	Version
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
PFTTrDA	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



Analytical Laboratory Report

Sample Summary (10 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S23413.01	Outfall010_042121	Groundwater	04/21/21 09:15
S23413.02	MHE_042121	Groundwater	04/21/21 09:45
S23413.03	MHE-1_042121	Groundwater	04/21/21 11:00
S23413.04	MHH-1A_042121	Groundwater	04/21/21 11:30
S23413.05	MH10-5_042121	Groundwater	04/21/21 12:15
S23413.06	MH11-6_042121	Groundwater	04/21/21 12:50
S23413.07	Outfall003_042121	Groundwater	04/21/21 13:30
S23413.08	MH3-6_042121	Groundwater	04/21/21 14:00
S23413.09	MH3-38_042121	Groundwater	04/21/21 14:40
S23413.10	MH3-52_042121	Groundwater	04/21/21 15:15



Analytical Laboratory Report

Lab Sample ID: S23413.01

Sample Tag: Outfall010_042121

Collected Date/Time: 04/21/2021 09:15

Matrix: Groundwater

COC Reference: 135617

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.32/6.87/11	ASTMD7979-19M	04/23/21 11:00	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 04/23/21 19:16, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	22	10		ng/L	2.02	375-22-4	
PFPeA*	44	4.0		ng/L	2.02	2706-90-3	
4:2 FTSA*	Not detected	2.0		ng/L	2.02	757124-72-4	
PFHxA*	150	2.0		ng/L	2.02	307-24-4	
PFBS*	60	2.0		ng/L	2.02	375-73-5	
PFHpA*	38	2.0		ng/L	2.02	375-85-9	
PFPeS*	87	2.0		ng/L	2.02	2706-91-4	
6:2 FTSA*	Not detected	2.0		ng/L	2.02	27619-97-2	
PFOA*	120	2.0		ng/L	2.02	335-67-1	
PFHxS*	1,100	2.0		ng/L	2.02	355-46-4	
PFHxS-LN*	950	2.0		ng/L	2.02	355-46-4-LN	
PFHxS-BR*	190	2.0		ng/L	2.02	355-46-4-BR	
PFNA*	7.1	2.0		ng/L	2.02	375-95-1	
8:2 FTSA*	Not detected	2.0		ng/L	2.02	39108-34-4	
PFHpS*	57	2.0		ng/L	2.02	375-92-8	
PFDA*	Not detected	2.0		ng/L	2.02	335-76-2	
N-MeFOSAA*	Not detected	2.0		ng/L	2.02	2355-31-9	
EtFOSAA*	Not detected	4.0		ng/L	2.02	2991-50-6	
PFOS*	1,900	2.0		ng/L	2.02	1763-23-1	
PFOS-LN*	830	2.0		ng/L	2.02	1763-23-1-LN	
PFOS-BR*	1,000	2.0		ng/L	2.02	1763-23-1-BR	
PFUnDA*	Not detected	2.0		ng/L	2.02	2058-94-8	
PFNS*	Not detected	2.0		ng/L	2.02	68259-12-1	
PFDODA*	Not detected	2.0		ng/L	2.02	307-55-1	
PFDS*	Not detected	2.0		ng/L	2.02	335-77-3	
PFTTrDA*	Not detected	2.0		ng/L	2.02	72629-94-8	
FOSA*	Not detected	2.0		ng/L	2.02	754-91-6	
PFTeDA*	Not detected	4.0		ng/L	2.02	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0		ng/L	2.02	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0		ng/L	2.02	756426-58-1	
ADONA*	Not detected	2.0		ng/L	2.02	919005-14-4	
HFPO-DA*	Not detected	2.0		ng/L	2.02	13252-13-6	



Analytical Laboratory Report

Lab Sample ID: S23413.02

Sample Tag: MHE_042121

Collected Date/Time: 04/21/2021 09:45

Matrix: Groundwater

COC Reference: 135617

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.31/6.86/11	ASTMD7979-19M	04/23/21 11:00	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 04/23/21 21:27, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	18	10		ng/L	2.02	375-22-4	
PFPeA*	25	4.0		ng/L	2.02	2706-90-3	
4:2 FTSA*	Not detected	2.0		ng/L	2.02	757124-72-4	
PFHxA*	91	2.0		ng/L	2.02	307-24-4	
PFBS*	41	2.0		ng/L	2.02	375-73-5	
PFHpA*	17	2.0		ng/L	2.02	375-85-9	
PFPeS*	56	2.0		ng/L	2.02	2706-91-4	
6:2 FTSA*	Not detected	2.0		ng/L	2.02	27619-97-2	
PFOA*	57	2.0		ng/L	2.02	335-67-1	
PFHxS*	700	2.0		ng/L	2.02	355-46-4	
PFHxS-LN*	600	2.0		ng/L	2.02	355-46-4-LN	
PFHxS-BR*	110	2.0		ng/L	2.02	355-46-4-BR	
PFNA*	4.5	2.0		ng/L	2.02	375-95-1	
8:2 FTSA*	Not detected	2.0		ng/L	2.02	39108-34-4	
PFHpS*	43	2.0		ng/L	2.02	375-92-8	
PFDA*	Not detected	2.0		ng/L	2.02	335-76-2	
N-MeFOSAA*	Not detected	2.0		ng/L	2.02	2355-31-9	
EtFOSAA*	Not detected	4.0		ng/L	2.02	2991-50-6	
PFOS*	1,900	2.0		ng/L	2.02	1763-23-1	
PFOS-LN*	1,100	2.0		ng/L	2.02	1763-23-1-LN	
PFOS-BR*	810	2.0		ng/L	2.02	1763-23-1-BR	
PFUnDA*	Not detected	2.0		ng/L	2.02	2058-94-8	
PFNS*	Not detected	2.0		ng/L	2.02	68259-12-1	
PfDoDA*	Not detected	2.0		ng/L	2.02	307-55-1	
PFDS*	Not detected	2.0		ng/L	2.02	335-77-3	
PFTTrDA*	Not detected	2.0		ng/L	2.02	72629-94-8	
FOSA*	Not detected	2.0		ng/L	2.02	754-91-6	
PFTeDA*	Not detected	4.0		ng/L	2.02	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0		ng/L	2.02	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0		ng/L	2.02	756426-58-1	
ADONA*	Not detected	2.0		ng/L	2.02	919005-14-4	
HFPO-DA*	Not detected	2.0		ng/L	2.02	13252-13-6	



Analytical Laboratory Report

Lab Sample ID: S23413.03

Sample Tag: MHE-1_042121

Collected Date/Time: 04/21/2021 11:00

Matrix: Groundwater

COC Reference: 135617

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	11.59/6.89/10	ASTMD7979-19M	04/23/21 11:00	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 04/23/21 21:47, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	23	11		ng/L	2.13	375-22-4	
PFPeA*	35	4.3		ng/L	2.13	2706-90-3	
4:2 FTSA*	Not detected	2.1		ng/L	2.13	757124-72-4	
PFHxA*	170	2.1		ng/L	2.13	307-24-4	
PFBS*	60	2.1		ng/L	2.13	375-73-5	
PFHpA*	31	2.1		ng/L	2.13	375-85-9	
PFPeS*	85	2.1		ng/L	2.13	2706-91-4	
6:2 FTSA*	Not detected	2.1		ng/L	2.13	27619-97-2	
PFOA*	110	2.1		ng/L	2.13	335-67-1	
PFHxS*	1,300	2.1		ng/L	2.13	355-46-4	
PFHxS-LN*	1,100	2.1		ng/L	2.13	355-46-4-LN	
PFHxS-BR*	190	2.1		ng/L	2.13	355-46-4-BR	
PFNA*	5.6	2.1		ng/L	2.13	375-95-1	
8:2 FTSA*	Not detected	2.1		ng/L	2.13	39108-34-4	
PFHpS*	71	2.1		ng/L	2.13	375-92-8	
PFDA*	Not detected	2.1		ng/L	2.13	335-76-2	
N-MeFOSAA*	Not detected	2.1		ng/L	2.13	2355-31-9	
EtFOSAA*	Not detected	4.3		ng/L	2.13	2991-50-6	
PFOS*	3,300	2.1		ng/L	2.13	1763-23-1	
PFOS-LN*	1,900	2.1		ng/L	2.13	1763-23-1-LN	
PFOS-BR*	1,400	2.1		ng/L	2.13	1763-23-1-BR	
PFUnDA*	Not detected	2.1		ng/L	2.13	2058-94-8	
PFNS*	Not detected	2.1		ng/L	2.13	68259-12-1	
PFDODA*	Not detected	2.1		ng/L	2.13	307-55-1	
PFDS*	Not detected	2.1		ng/L	2.13	335-77-3	
PFTTrDA*	Not detected	2.1		ng/L	2.13	72629-94-8	
FOSA*	Not detected	2.1		ng/L	2.13	754-91-6	
PFTeDA*	Not detected	4.3		ng/L	2.13	376-06-7	
11Cl-PF3OUdS*	Not detected	2.1		ng/L	2.13	763051-92-9	
9Cl-PF3ONS*	Not detected	2.1		ng/L	2.13	756426-58-1	
ADONA*	Not detected	2.1		ng/L	2.13	919005-14-4	
HFPO-DA*	Not detected	2.1		ng/L	2.13	13252-13-6	



Analytical Laboratory Report

Lab Sample ID: S23413.04

Sample Tag: MHH-1A_042121

Collected Date/Time: 04/21/2021 11:30

Matrix: Groundwater

COC Reference: 135617

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.49/6.95/11	ASTMD7979-19M	04/23/21 11:00	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 04/26/21 20:29, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	130	50		ng/L	9.93	375-22-4	Y
PFPeA*	280	20		ng/L	9.93	2706-90-3	Y
4:2 FTSA*	Not detected	9.9		ng/L	9.93	757124-72-4	Y
PFHxA*	1,600	9.9		ng/L	9.93	307-24-4	Y
PFBS*	450	9.9		ng/L	9.93	375-73-5	Y
PFHpA*	270	9.9		ng/L	9.93	375-85-9	Y
PFPeS*	790	9.9		ng/L	9.93	2706-91-4	Y
6:2 FTSA*	Not detected	9.9		ng/L	9.93	27619-97-2	Y
PFOA*	1,000	9.9		ng/L	9.93	335-67-1	Y
PFHxS*	11,000	9.9		ng/L	9.93	355-46-4	Y
PFHxS-LN*	9,300	9.9		ng/L	9.93	355-46-4-LN	Y
PFHxS-BR*	1,600	9.9		ng/L	9.93	355-46-4-BR	Y
PFNA*	28	9.9		ng/L	9.93	375-95-1	Y
8:2 FTSA*	Not detected	9.9		ng/L	9.93	39108-34-4	Y
PFHpS*	620	9.9		ng/L	9.93	375-92-8	Y
PFDA*	15	9.9		ng/L	9.93	335-76-2	Y
N-MeFOSAA*	Not detected	9.9		ng/L	9.93	2355-31-9	Y
EtFOSAA*	Not detected	20		ng/L	9.93	2991-50-6	Y
PFOS*	27,000	9.9		ng/L	9.93	1763-23-1	Y
PFOS-LN*	15,000	9.9		ng/L	9.93	1763-23-1-LN	Y
PFOS-BR*	13,000	9.9		ng/L	9.93	1763-23-1-BR	Y
PFUnDA*	Not detected	9.9		ng/L	9.93	2058-94-8	Y
PFNS*	Not detected	9.9		ng/L	9.93	68259-12-1	Y
PFDODA*	Not detected	9.9		ng/L	9.93	307-55-1	Y
PFDS*	Not detected	9.9		ng/L	9.93	335-77-3	Y
PFTTrDA*	Not detected	9.9		ng/L	9.93	72629-94-8	Y
FOSA*	Not detected	9.9		ng/L	9.93	754-91-6	Y
PFTeDA*	Not detected	20		ng/L	9.93	376-06-7	Y
11Cl-PF3OUdS*	Not detected	9.9		ng/L	9.93	763051-92-9	Y
9Cl-PF3ONS*	Not detected	9.9		ng/L	9.93	756426-58-1	Y
ADONA*	Not detected	9.9		ng/L	9.93	919005-14-4	Y
HFPO-DA*	Not detected	9.9		ng/L	9.93	13252-13-6	Y

Y-Elevated reporting limit due to high target concentration



Analytical Laboratory Report

Lab Sample ID: S23413.05

Sample Tag: MH10-5_042121

Collected Date/Time: 04/21/2021 12:15

Matrix: Groundwater

COC Reference: 135617

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.08/6.93/11	ASTMD7979-19M	04/23/21 11:00	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 04/23/21 22:26, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	36	11		ng/L	2.14	375-22-4	
PFPeA*	82	4.3		ng/L	2.14	2706-90-3	
4:2 FTSA*	Not detected	2.1		ng/L	2.14	757124-72-4	
PFHxA*	300	2.1		ng/L	2.14	307-24-4	
PFBS*	79	2.1		ng/L	2.14	375-73-5	
PFHpA*	66	2.1		ng/L	2.14	375-85-9	
PFPeS*	170	2.1		ng/L	2.14	2706-91-4	
6:2 FTSA*	Not detected	2.1		ng/L	2.14	27619-97-2	
PFOA*	340	2.1		ng/L	2.14	335-67-1	
PFHxS*	3,300	2.1		ng/L	2.14	355-46-4	
PFHxS-LN*	2,800	2.1		ng/L	2.14	355-46-4-LN	
PFHxS-BR*	480	2.1		ng/L	2.14	355-46-4-BR	
PFNA*	8.4	2.1		ng/L	2.14	375-95-1	
8:2 FTSA*	Not detected	2.1		ng/L	2.14	39108-34-4	
PFHpS*	230	2.1		ng/L	2.14	375-92-8	
PFDA*	Not detected	2.1		ng/L	2.14	335-76-2	
N-MeFOSAA*	Not detected	2.1		ng/L	2.14	2355-31-9	
EtFOSAA*	Not detected	4.3		ng/L	2.14	2991-50-6	
PFOS*	5,500	2.1		ng/L	2.14	1763-23-1	
PFOS-LN*	2,400	2.1		ng/L	2.14	1763-23-1-LN	
PFOS-BR*	3,100	2.1		ng/L	2.14	1763-23-1-BR	
PFUnDA*	Not detected	2.1		ng/L	2.14	2058-94-8	
PFNS*	Not detected	2.1		ng/L	2.14	68259-12-1	
PFDODA*	Not detected	2.1		ng/L	2.14	307-55-1	
PFDS*	Not detected	2.1		ng/L	2.14	335-77-3	
PFTTrDA*	Not detected	2.1		ng/L	2.14	72629-94-8	
FOSA*	Not detected	2.1		ng/L	2.14	754-91-6	
PFTeDA*	Not detected	4.3		ng/L	2.14	376-06-7	
11Cl-PF3OUdS*	Not detected	2.1		ng/L	2.14	763051-92-9	
9Cl-PF3ONS*	Not detected	2.1		ng/L	2.14	756426-58-1	
ADONA*	Not detected	2.1		ng/L	2.14	919005-14-4	
HFPO-DA*	Not detected	2.1		ng/L	2.14	13252-13-6	



Analytical Laboratory Report

Lab Sample ID: S23413.06

Sample Tag: MH11-6_042121

Collected Date/Time: 04/21/2021 12:50

Matrix: Groundwater

COC Reference: 135617

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.11/6.84/11	ASTMD7979-19M	04/23/21 11:00	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 04/23/21 22:45, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	18	10		ng/L	2.09	375-22-4	
PFPeA*	30	4.2		ng/L	2.09	2706-90-3	
4:2 FTSA*	Not detected	2.1		ng/L	2.09	757124-72-4	
PFHxA*	35	2.1		ng/L	2.09	307-24-4	
PFBS*	7.4	2.1		ng/L	2.09	375-73-5	
PFHpA*	17	2.1		ng/L	2.09	375-85-9	
PFPeS*	4.9	2.1		ng/L	2.09	2706-91-4	
6:2 FTSA*	Not detected	2.1		ng/L	2.09	27619-97-2	
PFOA*	27	2.1		ng/L	2.09	335-67-1	
PFHxS*	87	2.1		ng/L	2.09	355-46-4	
PFHxS-LN*	73	2.1		ng/L	2.09	355-46-4-LN	
PFHxS-BR*	13	2.1		ng/L	2.09	355-46-4-BR	
PFNA*	7.1	2.1		ng/L	2.09	375-95-1	
8:2 FTSA*	Not detected	2.1		ng/L	2.09	39108-34-4	
PFHpS*	2.7	2.1		ng/L	2.09	375-92-8	
PFDA*	Not detected	2.1		ng/L	2.09	335-76-2	
N-MeFOSAA*	Not detected	2.1		ng/L	2.09	2355-31-9	
EtFOSAA*	Not detected	4.2		ng/L	2.09	2991-50-6	
PFOS*	90	2.1		ng/L	2.09	1763-23-1	
PFOS-LN*	51	2.1		ng/L	2.09	1763-23-1-LN	
PFOS-BR*	38	2.1		ng/L	2.09	1763-23-1-BR	
PFUnDA*	Not detected	2.1		ng/L	2.09	2058-94-8	
PFNS*	Not detected	2.1		ng/L	2.09	68259-12-1	
PFDODA*	Not detected	2.1		ng/L	2.09	307-55-1	
PFDS*	Not detected	2.1		ng/L	2.09	335-77-3	
PFTTrDA*	Not detected	2.1		ng/L	2.09	72629-94-8	
FOSA*	Not detected	2.1		ng/L	2.09	754-91-6	
PFTeDA*	Not detected	4.2		ng/L	2.09	376-06-7	
11Cl-PF3OUdS*	Not detected	2.1		ng/L	2.09	763051-92-9	
9Cl-PF3ONS*	Not detected	2.1		ng/L	2.09	756426-58-1	
ADONA*	Not detected	2.1		ng/L	2.09	919005-14-4	
HFPO-DA*	Not detected	2.1		ng/L	2.09	13252-13-6	



Analytical Laboratory Report

Lab Sample ID: S23413.07

Sample Tag: Outfall003_042121

Collected Date/Time: 04/21/2021 13:30

Matrix: Groundwater

COC Reference: 135617

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	11.99/6.97/10	ASTMD7979-19M	04/23/21 11:00	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 04/23/21 23:05, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	18		ng/L	1.99	375-22-4	X
PFPeA*	Not detected	4.0		ng/L	1.99	2706-90-3	
4:2 FTSA*	Not detected	2.0		ng/L	1.99	757124-72-4	
PFHxA*	5.6	2.0		ng/L	1.99	307-24-4	
PFBS*	3.0	2.0		ng/L	1.99	375-73-5	
PFHpA*	2.4	2.0		ng/L	1.99	375-85-9	
PFPeS*	2.5	2.0		ng/L	1.99	2706-91-4	
6:2 FTSA*	Not detected	2.0		ng/L	1.99	27619-97-2	
PFOA*	8.6	2.0		ng/L	1.99	335-67-1	
PFHxS*	26	2.0		ng/L	1.99	355-46-4	
PFHxS-LN*	21	2.0		ng/L	1.99	355-46-4-LN	
PFHxS-BR*	4.3	2.0		ng/L	1.99	355-46-4-BR	
PFNA*	2.6	2.0		ng/L	1.99	375-95-1	
8:2 FTSA*	Not detected	2.0		ng/L	1.99	39108-34-4	
PFHpS*	Not detected	2.0		ng/L	1.99	375-92-8	
PFDA*	Not detected	2.0		ng/L	1.99	335-76-2	
N-MeFOSAA*	Not detected	2.0		ng/L	1.99	2355-31-9	
EtFOSAA*	Not detected	4.0		ng/L	1.99	2991-50-6	
PFOS*	110	2.0		ng/L	1.99	1763-23-1	
PFOS-LN*	69	2.0		ng/L	1.99	1763-23-1-LN	
PFOS-BR*	45	2.0		ng/L	1.99	1763-23-1-BR	
PFUnDA*	Not detected	2.0		ng/L	1.99	2058-94-8	
PFNS*	Not detected	2.0		ng/L	1.99	68259-12-1	
PFDODA*	Not detected	2.0		ng/L	1.99	307-55-1	
PFDS*	Not detected	2.0		ng/L	1.99	335-77-3	
PFTDA*	Not detected	2.0		ng/L	1.99	72629-94-8	
FOSA*	Not detected	2.0		ng/L	1.99	754-91-6	
PFTeDA*	Not detected	4.0		ng/L	1.99	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0		ng/L	1.99	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0		ng/L	1.99	756426-58-1	
ADONA*	Not detected	2.0		ng/L	1.99	919005-14-4	
HFPO-DA*	Not detected	2.0		ng/L	1.99	13252-13-6	

X-Elevated reporting limit due to matrix interference



Analytical Laboratory Report

Lab Sample ID: S23413.08

Sample Tag: MH3-6_042121

Collected Date/Time: 04/21/2021 14:00

Matrix: Groundwater

COC Reference: 135617

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.25/6.82/11	ASTMD7979-19M	04/23/21 11:00	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 04/23/21 23:24, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	12		ng/L	2.03	375-22-4	X
PFPeA*	Not detected	4.1		ng/L	2.03	2706-90-3	
4:2 FTSA*	Not detected	2.0		ng/L	2.03	757124-72-4	
PFHxA*	4.9	2.0		ng/L	2.03	307-24-4	
PFBS*	3.8	2.0		ng/L	2.03	375-73-5	
PFHpA*	Not detected	2.0		ng/L	2.03	375-85-9	
PFPeS*	2.2	2.0		ng/L	2.03	2706-91-4	
6:2 FTSA*	Not detected	2.0		ng/L	2.03	27619-97-2	
PFOA*	5.6	2.0		ng/L	2.03	335-67-1	
PFHxS*	25	2.0		ng/L	2.03	355-46-4	
PFHxS-LN*	20	2.0		ng/L	2.03	355-46-4-LN	
PFHxS-BR*	3.4	2.0		ng/L	2.03	355-46-4-BR	
PFNA*	Not detected	2.0		ng/L	2.03	375-95-1	
8:2 FTSA*	Not detected	2.0		ng/L	2.03	39108-34-4	
PFHpS*	Not detected	2.0		ng/L	2.03	375-92-8	
PFDA*	Not detected	2.0		ng/L	2.03	335-76-2	
N-MeFOSAA*	Not detected	2.0		ng/L	2.03	2355-31-9	
EtFOSAA*	Not detected	4.1		ng/L	2.03	2991-50-6	
PFOS*	25	2.0		ng/L	2.03	1763-23-1	
PFOS-LN*	14	2.0		ng/L	2.03	1763-23-1-LN	
PFOS-BR*	11	2.0		ng/L	2.03	1763-23-1-BR	
PFUnDA*	Not detected	2.0		ng/L	2.03	2058-94-8	
PFNS*	Not detected	2.0		ng/L	2.03	68259-12-1	
PFDODA*	Not detected	2.0		ng/L	2.03	307-55-1	
PFDS*	Not detected	2.0		ng/L	2.03	335-77-3	
PFTTrDA*	Not detected	2.0		ng/L	2.03	72629-94-8	
FOSA*	Not detected	2.0		ng/L	2.03	754-91-6	
PFTeDA*	Not detected	4.1		ng/L	2.03	376-06-7	
11Cl-PF3OUdS*	Not detected	2.0		ng/L	2.03	763051-92-9	
9Cl-PF3ONS*	Not detected	2.0		ng/L	2.03	756426-58-1	
ADONA*	Not detected	2.0		ng/L	2.03	919005-14-4	
HFPO-DA*	Not detected	2.0		ng/L	2.03	13252-13-6	

X-Elevated reporting limit due to matrix interference



Analytical Laboratory Report

Lab Sample ID: S23413.09

Sample Tag: MH3-38_042121

Collected Date/Time: 04/21/2021 14:40

Matrix: Groundwater

COC Reference: 135617

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.04/6.91/11	ASTMD7979-19M	04/23/21 11:00	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 04/23/21 23:44, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	11		ng/L	2.14	375-22-4	
PFPeA*	Not detected	4.3		ng/L	2.14	2706-90-3	
4:2 FTSA*	Not detected	2.1		ng/L	2.14	757124-72-4	
PFHxA*	Not detected	2.1		ng/L	2.14	307-24-4	
PFBS*	2.5	2.1		ng/L	2.14	375-73-5	
PFHpA*	Not detected	2.1		ng/L	2.14	375-85-9	
PFPeS*	Not detected	2.1		ng/L	2.14	2706-91-4	
6:2 FTSA*	Not detected	2.1		ng/L	2.14	27619-97-2	
PFOA*	Not detected	2.1		ng/L	2.14	335-67-1	
PFHxS*	5.2	2.1		ng/L	2.14	355-46-4	
PFHxS-LN*	3.9	2.1		ng/L	2.14	355-46-4-LN	
PFHxS-BR*	Not detected	2.1		ng/L	2.14	355-46-4-BR	
PFNA*	Not detected	2.1		ng/L	2.14	375-95-1	
8:2 FTSA*	Not detected	2.1		ng/L	2.14	39108-34-4	
PFHpS*	Not detected	2.1		ng/L	2.14	375-92-8	
PFDA*	Not detected	2.1		ng/L	2.14	335-76-2	
N-MeFOSAA*	Not detected	2.1		ng/L	2.14	2355-31-9	
EtFOSAA*	Not detected	4.3		ng/L	2.14	2991-50-6	
PFOS*	2.7	2.1		ng/L	2.14	1763-23-1	
PFOS-LN*	Not detected	2.1		ng/L	2.14	1763-23-1-LN	
PFOS-BR*	Not detected	2.1		ng/L	2.14	1763-23-1-BR	
PFUnDA*	Not detected	2.1		ng/L	2.14	2058-94-8	
PFNS*	Not detected	2.1		ng/L	2.14	68259-12-1	
PFDODA*	Not detected	2.1		ng/L	2.14	307-55-1	
PFDS*	Not detected	2.1		ng/L	2.14	335-77-3	
PFTTrDA*	Not detected	2.1		ng/L	2.14	72629-94-8	
FOSA*	Not detected	2.1		ng/L	2.14	754-91-6	
PFTeDA*	Not detected	4.3		ng/L	2.14	376-06-7	
11Cl-PF3OUdS*	Not detected	2.1		ng/L	2.14	763051-92-9	
9Cl-PF3ONS*	Not detected	2.1		ng/L	2.14	756426-58-1	
ADONA*	Not detected	2.1		ng/L	2.14	919005-14-4	
HFPO-DA*	Not detected	2.1		ng/L	2.14	13252-13-6	



Analytical Laboratory Report

Lab Sample ID: S23413.10

Sample Tag: MH3-52_042121

Collected Date/Time: 04/21/2021 15:15

Matrix: Groundwater

COC Reference: 135617

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	4.4	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.04/6.94/11	ASTMD7979-19M	04/23/21 11:00	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 04/24/21 00:03, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	11		ng/L	2.16	375-22-4	
PFPeA*	Not detected	4.3		ng/L	2.16	2706-90-3	
4:2 FTSA*	Not detected	2.2		ng/L	2.16	757124-72-4	
PFHxA*	Not detected	2.2		ng/L	2.16	307-24-4	
PFBS*	3.4	2.2		ng/L	2.16	375-73-5	
PFHpA*	Not detected	2.2		ng/L	2.16	375-85-9	
PFPeS*	Not detected	2.2		ng/L	2.16	2706-91-4	
6:2 FTSA*	Not detected	2.2		ng/L	2.16	27619-97-2	
PFOA*	Not detected	2.2		ng/L	2.16	335-67-1	
PFHxS*	Not detected	2.2		ng/L	2.16	355-46-4	
PFHxS-LN*	Not detected	2.2		ng/L	2.16	355-46-4-LN	
PFHxS-BR*	Not detected	2.2		ng/L	2.16	355-46-4-BR	
PFNA*	Not detected	2.2		ng/L	2.16	375-95-1	
8:2 FTSA*	Not detected	2.2		ng/L	2.16	39108-34-4	
PFHpS*	Not detected	2.2		ng/L	2.16	375-92-8	
PFDA*	Not detected	2.2		ng/L	2.16	335-76-2	
N-MeFOSAA*	Not detected	2.2		ng/L	2.16	2355-31-9	
EtFOSAA*	Not detected	4.3		ng/L	2.16	2991-50-6	
PFOS*	2.4	2.2		ng/L	2.16	1763-23-1	
PFOS-LN*	Not detected	2.2		ng/L	2.16	1763-23-1-LN	
PFOS-BR*	Not detected	2.2		ng/L	2.16	1763-23-1-BR	
PFUnDA*	Not detected	2.2		ng/L	2.16	2058-94-8	
PFNS*	Not detected	2.2		ng/L	2.16	68259-12-1	
PFDODA*	Not detected	2.2		ng/L	2.16	307-55-1	
PFDS*	Not detected	2.2		ng/L	2.16	335-77-3	
PFTDA*	Not detected	2.2		ng/L	2.16	72629-94-8	
FOSA*	Not detected	2.2		ng/L	2.16	754-91-6	
PFTeDA*	Not detected	4.3		ng/L	2.16	376-06-7	
11Cl-PF3OUdS*	Not detected	2.2		ng/L	2.16	763051-92-9	
9Cl-PF3ONS*	Not detected	2.2		ng/L	2.16	756426-58-1	
ADONA*	Not detected	2.2		ng/L	2.16	919005-14-4	
HFPO-DA*	Not detected	2.2		ng/L	2.16	13252-13-6	

Merit Laboratories Login Checklist

Lab Set ID:S23413

Client:ARCADIS_NOVI (ARCADIS U.S., Inc.)

Project: 30075935.03200 / Arcadis

Submitted:04/21/2021 16:15 Login User: SRS

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.	☒ Yes ☐ No ☐ N/A	Samples are received at 4C +/- 2C Thermometer # IR 4.4
02.	☒ Yes ☐ No ☐ N/A	Received on ice/ cooling process begun
03.	☐ Yes ☒ No ☐ N/A	Samples shipped
04.	☐ Yes ☒ No ☐ N/A	Samples left in 24 hr. drop box
05.	☐ Yes ☐ No ☒ N/A	Are there custody seals/tape or is the drop box locked
Chain of Custody		
06.	☒ Yes ☐ No ☐ N/A	COC adequately filled out
07.	☒ Yes ☐ No ☐ N/A	COC signed and relinquished to the lab
08.	☒ Yes ☐ No ☐ N/A	Sample tag on bottles match COC
09.	☐ Yes ☒ No ☐ N/A	Subcontracting needed? Subcontacted to:
Preservation		
10.	☐ Yes ☐ No ☒ N/A	Do sample have correct chemical preservation
11.	☐ Yes ☐ No ☒ N/A	Completed pH checks on preserved samples? (no VOAs)
12.	☐ Yes ☒ No ☐ N/A	Did any samples need to be preserved in the lab?
Bottle Conditions		
13.	☒ Yes ☐ No ☐ N/A	All bottles intact
14.	☒ Yes ☐ No ☐ N/A	Appropriate analytical bottles are used
15.	☒ Yes ☐ No ☐ N/A	Merit bottles used
16.	☒ Yes ☐ No ☐ N/A	Sufficient sample volume received
17.	☐ Yes ☒ No ☐ N/A	Samples require laboratory filtration
18.	☒ Yes ☐ No ☐ N/A	Samples submitted within holding time
19.	☐ Yes ☐ No ☒ 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: _____

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		FAX NO.	P.O. NO.
E-MAIL ADDRESS Joey.Barker@arcadis.com		QUOTE NO.	

CHAIN OF CUSTODY RECORD

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

INVOICE TO

PROJECT NO./NAME 30075935.03200/Arcadis	SAMPLER(S) - PLEASE PRINT/SIGN NAME Donald Richardson / Sami Richard
TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____	
DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER _____	

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

Certifications

☐ OHIO VAP ☐ Drinking Water
☐ DoD ☐ NPDES

Project Locations

☐ Detroit ☐ New York☐ Other _____

Special Instructions

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

Containers & Preservatives

MERIT LAB NO. FOR LAB USE ONLY	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO ₃	H ₂ SO ₄	NaOH	MeOH	OTHER	☐ Other _____
	DATE	TIME											Special Instructions
23413.01	4/21/21	0915	Outfall 010 - 042121	GW	3	X							PFA
.02	4/21/21	0945	MHE - 042121	GW	3	X							
.03	4/21/21	1100	MHE-1 - 042121	GW	3	X							
.04	4/21/21	1130	MHE-1A - 042121	GW	3	X							
.05	4/21/21	1215	MH 10-5 - 042121	GW	3	X							
.06	4/21/21	1250	MH 11-6 - 042121	GW	3	X							
.07	4/21/21	1330	Outfall 003 - 042121	GW	3	X							
.08	4/21/21	1400	MH 3-6 - 042121	GW	3	X							
.09	4/21/21	1440	MH 3-38 - 042121	GW	3	X							
.10	4/21/21	1515	MH 3-52 - 042121	GW	3	X							

RELINQUISHED BY:	☒ Sampler	DATE	TIME
SIGNATURE/ORGANIZATION		4/21/21	15:39
RECEIVED BY:		DATE	TIME
SIGNATURE/ORGANIZATION		4/21/21	15:38
RELINQUISHED BY:		DATE	TIME
SIGNATURE/ORGANIZATION		4/21/21	16:05
RECEIVED BY:		DATE	TIME
SIGNATURE/ORGANIZATION		4/21/21	16:05

RELINQUISHED BY: SIGNATURE/ORGANIZATION			DATE	TIME
RECEIVED BY: SIGNATURE/ORGANIZATION			DATE	TIME
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	NOTES: TEMP. ON ARRIVAL _____ 4.4	
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS		

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



Analytical Laboratory Report

Report ID: S22480.01(01)
Generated on 03/30/2021

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

Additional Contacts: Megan Humphrey, Micki Maki, 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 Lavery (johnlavery@meritlabs.com)
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S22480.01-S22480.06
Project: 30075935.03200 / Buick City
Collected Date(s): 03/23/2021
Submitted Date/Time: 03/23/2021 15:10
Sampled by: Donald Richmond
P.O. #: 30075935.03200

Table of Contents

Cover Page (Page 1)
General Report Notes (Page 2)
Report Narrative (Page 2)
Laboratory Certifications (Page 3)
Qualifier Descriptions (Page 3)
Glossary of Abbreviations (Page 3)
Method Summary (Page 4)
Sample Summary (Page 5)

Maya Murshak
Technical Director



Analytical Laboratory Report

General Report Notes

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Report Narrative

There is no additional narrative for this analytical report

Laboratory Certifications

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

Qualifier Descriptions

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

Glossary of Abbreviations

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

Method Summary

Method	Version
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
PFTTrDA	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



Analytical Laboratory Report

Sample Summary (6 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S22480.01	MHE_032321	Groundwater	03/23/21 10:00
S22480.02	Outfall 010_032321	Groundwater	03/23/21 09:30
S22480.03	MHE-1_032321	Groundwater	03/23/21 10:30
S22480.04	MHH-1A_032321	Groundwater	03/23/21 11:15
S22480.05	MH11-6_032321	Groundwater	03/23/21 12:00
S22480.06	MH10-5_032321	Groundwater	03/23/21 12:55



Analytical Laboratory Report

Lab Sample ID: S22480.01

Sample Tag: MHE_032321

Collected Date/Time: 03/23/2021 10:00

Matrix: Groundwater

COC Reference: 142081

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.6	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.11/7.06/10	ASTMD7979-19M	03/25/21 12:00	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 03/25/21 21:51, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	20		ng/L	1.98	375-22-4	
PFPeA*	24	9.9		ng/L	1.98	2706-90-3	
4:2 FTSA*	Not detected	9.9		ng/L	1.98	757124-72-4	
PFHxA*	100	9.9		ng/L	1.98	307-24-4	
PFBS*	41	9.9		ng/L	1.98	375-73-5	
PFHpA*	18	9.9		ng/L	1.98	375-85-9	
PFPeS*	63	9.9		ng/L	1.98	2706-91-4	
6:2 FTSA*	Not detected	9.9		ng/L	1.98	27619-97-2	
PFOA*	62	9.9		ng/L	1.98	335-67-1	
PFHxS*	690	9.9		ng/L	1.98	355-46-4	
PFHxS-LN*	580	9.9		ng/L	1.98	355-46-4-LN	
PFHxS-BR*	110	9.9		ng/L	1.98	355-46-4-BR	
PFNA*	Not detected	9.9		ng/L	1.98	375-95-1	
8:2 FTSA*	Not detected	9.9		ng/L	1.98	39108-34-4	
PFHpS*	39	9.9		ng/L	1.98	375-92-8	
PFDA*	Not detected	9.9		ng/L	1.98	335-76-2	
N-MeFOSAA*	Not detected	9.9		ng/L	1.98	2355-31-9	
EtFOSAA*	Not detected	9.9		ng/L	1.98	2991-50-6	
PFOS*	2,100	9.9		ng/L	1.98	1763-23-1	
PFOS-LN*	1,100	9.9		ng/L	1.98	1763-23-1-LN	
PFOS-BR*	960	9.9		ng/L	1.98	1763-23-1-BR	
PFUnDA*	Not detected	9.9		ng/L	1.98	2058-94-8	
PFNS*	Not detected	9.9		ng/L	1.98	68259-12-1	
PFDODA*	Not detected	9.9		ng/L	1.98	307-55-1	
PFDS*	Not detected	9.9		ng/L	1.98	335-77-3	
PFTDA*	Not detected	9.9		ng/L	1.98	72629-94-8	
FOSA*	Not detected	9.9		ng/L	1.98	754-91-6	
PFTeDA*	Not detected	9.9		ng/L	1.98	376-06-7	
11Cl-PF3OUdS*	Not detected	9.9		ng/L	1.98	763051-92-9	
9Cl-PF3ONS*	Not detected	9.9		ng/L	1.98	756426-58-1	
ADONA*	Not detected	9.9		ng/L	1.98	919005-14-4	
HFPO-DA*	Not detected	9.9		ng/L	1.98	13252-13-6	



Analytical Laboratory Report

Lab Sample ID: S22480.02

Sample Tag: Outfall 010_032321

Collected Date/Time: 03/23/2021 09:30

Matrix: Groundwater

COC Reference: 142081

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.6	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.85/7.08/12	ASTMD7979-19M	03/25/21 12:00	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 03/25/21 22:10, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	30	21		ng/L	2.08	375-22-4	
PFPeA*	51	10		ng/L	2.08	2706-90-3	
4:2 FTSA*	Not detected	10		ng/L	2.08	757124-72-4	
PFHxA*	220	10		ng/L	2.08	307-24-4	
PFBS*	80	10		ng/L	2.08	375-73-5	
PFHpA*	43	10		ng/L	2.08	375-85-9	
PFPeS*	120	10		ng/L	2.08	2706-91-4	
6:2 FTSA*	Not detected	10		ng/L	2.08	27619-97-2	
PFOA*	150	10		ng/L	2.08	335-67-1	
PFHxS*	1,600	10		ng/L	2.08	355-46-4	
PFHxS-LN*	1,400	10		ng/L	2.08	355-46-4-LN	
PFHxS-BR*	240	10		ng/L	2.08	355-46-4-BR	
PFNA*	12	10		ng/L	2.08	375-95-1	
8:2 FTSA*	Not detected	10		ng/L	2.08	39108-34-4	
PFHpS*	110	10		ng/L	2.08	375-92-8	
PFDA*	Not detected	10		ng/L	2.08	335-76-2	
N-MeFOSAA*	Not detected	10		ng/L	2.08	2355-31-9	
EtFOSAA*	Not detected	10		ng/L	2.08	2991-50-6	
PFOS*	7,600	10		ng/L	2.08	1763-23-1	
PFOS-LN*	3,800	10		ng/L	2.08	1763-23-1-LN	
PFOS-BR*	3,900	10		ng/L	2.08	1763-23-1-BR	
PFUnDA*	Not detected	10		ng/L	2.08	2058-94-8	
PFNS*	Not detected	10		ng/L	2.08	68259-12-1	
PFDODA*	Not detected	10		ng/L	2.08	307-55-1	
PFDS*	Not detected	10		ng/L	2.08	335-77-3	
PFTDA*	Not detected	10		ng/L	2.08	72629-94-8	
FOSA*	Not detected	10		ng/L	2.08	754-91-6	
PFTeDA*	Not detected	10		ng/L	2.08	376-06-7	
11Cl-PF3OUdS*	Not detected	10		ng/L	2.08	763051-92-9	
9Cl-PF3ONS*	Not detected	10		ng/L	2.08	756426-58-1	
ADONA*	Not detected	10		ng/L	2.08	919005-14-4	
HFPO-DA*	Not detected	10		ng/L	2.08	13252-13-6	



Analytical Laboratory Report

Lab Sample ID: S22480.03

Sample Tag: MHE-1_032321

Collected Date/Time: 03/23/2021 10:30

Matrix: Groundwater

COC Reference: 142081

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.6	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.17/7.07/11	ASTMD7979-19M	03/25/21 12:00	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 03/25/21 22:30, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	22		ng/L	2.16	375-22-4	
PFPeA*	26	11		ng/L	2.16	2706-90-3	
4:2 FTSA*	Not detected	11		ng/L	2.16	757124-72-4	
PFHxA*	110	11		ng/L	2.16	307-24-4	
PFBS*	48	11		ng/L	2.16	375-73-5	
PFHpA*	23	11		ng/L	2.16	375-85-9	
PFPeS*	68	11		ng/L	2.16	2706-91-4	
6:2 FTSA*	Not detected	11		ng/L	2.16	27619-97-2	
PFOA*	65	11		ng/L	2.16	335-67-1	
PFHxS*	790	11		ng/L	2.16	355-46-4	
PFHxS-LN*	670	11		ng/L	2.16	355-46-4-LN	
PFHxS-BR*	120	11		ng/L	2.16	355-46-4-BR	
PFNA*	Not detected	11		ng/L	2.16	375-95-1	
8:2 FTSA*	Not detected	11		ng/L	2.16	39108-34-4	
PFHpS*	40	11		ng/L	2.16	375-92-8	
PFDA*	Not detected	11		ng/L	2.16	335-76-2	
N-MeFOSAA*	Not detected	11		ng/L	2.16	2355-31-9	
EtFOSAA*	Not detected	11		ng/L	2.16	2991-50-6	
PFOS*	2,000	11		ng/L	2.16	1763-23-1	
PFOS-LN*	1,100	11		ng/L	2.16	1763-23-1-LN	
PFOS-BR*	910	11		ng/L	2.16	1763-23-1-BR	
PFUnDA*	Not detected	11		ng/L	2.16	2058-94-8	
PFNS*	Not detected	11		ng/L	2.16	68259-12-1	
PFDODA*	Not detected	11		ng/L	2.16	307-55-1	
PFDS*	Not detected	11		ng/L	2.16	335-77-3	
PFTDA*	Not detected	11		ng/L	2.16	72629-94-8	
FOSA*	Not detected	11		ng/L	2.16	754-91-6	
PFTeDA*	Not detected	11		ng/L	2.16	376-06-7	
11CI-PF3OUdS*	Not detected	11		ng/L	2.16	763051-92-9	
9CI-PF3ONS*	Not detected	11		ng/L	2.16	756426-58-1	
ADONA*	Not detected	11		ng/L	2.16	919005-14-4	
HFPO-DA*	Not detected	11		ng/L	2.16	13252-13-6	



Analytical Laboratory Report

Lab Sample ID: S22480.04

Sample Tag: MHH-1A_032321

Collected Date/Time: 03/23/2021 11:15

Matrix: Groundwater

COC Reference: 142081

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.6	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.50/7.10/11	ASTMD7979-19M	03/25/21 12:00	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 03/26/21 14:46, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	170	100		ng/L	10.2	375-22-4	Y
PFPeA*	340	51		ng/L	10.2	2706-90-3	Y
4:2 FTSA*	Not detected	51		ng/L	10.2	757124-72-4	Y
PFHxA*	1,900	51		ng/L	10.2	307-24-4	Y
PFBS*	620	51		ng/L	10.2	375-73-5	Y
PFHpA*	350	51		ng/L	10.2	375-85-9	Y
PFPeS*	1,200	51		ng/L	10.2	2706-91-4	Y
6:2 FTSA*	Not detected	51		ng/L	10.2	27619-97-2	Y
PFOA*	1,100	51		ng/L	10.2	335-67-1	Y
PFHxS*	15,000	51		ng/L	10.2	355-46-4	Y
PFHxS-LN*	13,000	51		ng/L	10.2	355-46-4-LN	Y
PFHxS-BR*	2,200	51		ng/L	10.2	355-46-4-BR	Y
PFNA*	Not detected	51		ng/L	10.2	375-95-1	Y
8:2 FTSA*	Not detected	51		ng/L	10.2	39108-34-4	Y
PFHpS*	810	51		ng/L	10.2	375-92-8	Y
PFDA*	Not detected	51		ng/L	10.2	335-76-2	Y
N-MeFOSAA*	Not detected	51		ng/L	10.2	2355-31-9	Y
EtFOSAA*	Not detected	51		ng/L	10.2	2991-50-6	Y
PFOS*	39,000	51		ng/L	10.2	1763-23-1	Y
PFOS-LN*	21,000	51		ng/L	10.2	1763-23-1-LN	Y
PFOS-BR*	18,000	51		ng/L	10.2	1763-23-1-BR	Y
PFUnDA*	Not detected	51		ng/L	10.2	2058-94-8	Y
PFNS*	Not detected	51		ng/L	10.2	68259-12-1	Y
PFDODA*	Not detected	51		ng/L	10.2	307-55-1	Y
PFDS*	Not detected	51		ng/L	10.2	335-77-3	Y
PFTTrDA*	Not detected	51		ng/L	10.2	72629-94-8	Y
FOSA*	Not detected	51		ng/L	10.2	754-91-6	Y
PFTeDA*	Not detected	51		ng/L	10.2	376-06-7	Y
11Cl-PF3OUdS*	Not detected	51		ng/L	10.2	763051-92-9	Y
9Cl-PF3ONS*	Not detected	51		ng/L	10.2	756426-58-1	Y
ADONA*	Not detected	51		ng/L	10.2	919005-14-4	Y
HFPO-DA*	Not detected	51		ng/L	10.2	13252-13-6	Y

Y-Elevated reporting limit due to high target concentration



Analytical Laboratory Report

Lab Sample ID: S22480.05

Sample Tag: MH11-6_032321

Collected Date/Time: 03/23/2021 12:00

Matrix: Groundwater

COC Reference: 142081

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.6	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.47/7.09/11	ASTMD7979-19M	03/25/21 12:00	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 03/25/21 23:09, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	20		ng/L	2.04	375-22-4	
PFPeA*	22	10		ng/L	2.04	2706-90-3	
4:2 FTSA*	Not detected	10		ng/L	2.04	757124-72-4	
PFHxA*	25	10		ng/L	2.04	307-24-4	
PFBS*	Not detected	10		ng/L	2.04	375-73-5	
PFHpA*	13	10		ng/L	2.04	375-85-9	
PFPeS*	Not detected	10		ng/L	2.04	2706-91-4	
6:2 FTSA*	Not detected	10		ng/L	2.04	27619-97-2	
PFOA*	18	10		ng/L	2.04	335-67-1	
PFHxS*	52	10		ng/L	2.04	355-46-4	
PFHxS-LN*	43	10		ng/L	2.04	355-46-4-LN	
PFHxS-BR*	Not detected	10		ng/L	2.04	355-46-4-BR	
PFNA*	Not detected	10		ng/L	2.04	375-95-1	
8:2 FTSA*	Not detected	10		ng/L	2.04	39108-34-4	
PFHpS*	Not detected	10		ng/L	2.04	375-92-8	
PFDA*	Not detected	10		ng/L	2.04	335-76-2	
N-MeFOSAA*	Not detected	10		ng/L	2.04	2355-31-9	
EtFOSAA*	Not detected	10		ng/L	2.04	2991-50-6	
PFOS*	65	10		ng/L	2.04	1763-23-1	
PFOS-LN*	38	10		ng/L	2.04	1763-23-1-LN	
PFOS-BR*	26	10		ng/L	2.04	1763-23-1-BR	
PFUnDA*	Not detected	10		ng/L	2.04	2058-94-8	
PFNS*	Not detected	10		ng/L	2.04	68259-12-1	
PFDODA*	Not detected	10		ng/L	2.04	307-55-1	
PFDS*	Not detected	10		ng/L	2.04	335-77-3	
PFTDA*	Not detected	10		ng/L	2.04	72629-94-8	
FOSA*	Not detected	10		ng/L	2.04	754-91-6	
PFTeDA*	Not detected	10		ng/L	2.04	376-06-7	
11Cl-PF3OUdS*	Not detected	10		ng/L	2.04	763051-92-9	
9Cl-PF3ONS*	Not detected	10		ng/L	2.04	756426-58-1	
ADONA*	Not detected	10		ng/L	2.04	919005-14-4	
HFPO-DA*	Not detected	10		ng/L	2.04	13252-13-6	



Analytical Laboratory Report

Lab Sample ID: S22480.06

Sample Tag: MH10-5_032321

Collected Date/Time: 03/23/2021 12:55

Matrix: Groundwater

COC Reference: 142081

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	2.6	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.11/7.06/10	ASTMD7979-19M	03/25/21 12:00	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 03/25/21 23:28, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	37	20		ng/L	1.98	375-22-4	
PFPeA*	81	9.9		ng/L	1.98	2706-90-3	
4:2 FTSA*	Not detected	9.9		ng/L	1.98	757124-72-4	
PFHxA*	330	9.9		ng/L	1.98	307-24-4	
PFBS*	85	9.9		ng/L	1.98	375-73-5	
PFHpA*	86	9.9		ng/L	1.98	375-85-9	
PFPeS*	190	9.9		ng/L	1.98	2706-91-4	
6:2 FTSA*	Not detected	9.9		ng/L	1.98	27619-97-2	
PFOA*	340	9.9		ng/L	1.98	335-67-1	
PFHxS*	3,600	9.9		ng/L	1.98	355-46-4	
PFHxS-LN*	3,100	9.9		ng/L	1.98	355-46-4-LN	
PFHxS-BR*	500	9.9		ng/L	1.98	355-46-4-BR	
PFNA*	Not detected	9.9		ng/L	1.98	375-95-1	
8:2 FTSA*	Not detected	9.9		ng/L	1.98	39108-34-4	
PFHpS*	200	9.9		ng/L	1.98	375-92-8	
PFDA*	Not detected	9.9		ng/L	1.98	335-76-2	
N-MeFOSAA*	Not detected	9.9		ng/L	1.98	2355-31-9	
EtFOSAA*	Not detected	9.9		ng/L	1.98	2991-50-6	
PFOS*	6,000	9.9		ng/L	1.98	1763-23-1	
PFOS-LN*	2,800	9.9		ng/L	1.98	1763-23-1-LN	
PFOS-BR*	3,200	9.9		ng/L	1.98	1763-23-1-BR	
PFUnDA*	Not detected	9.9		ng/L	1.98	2058-94-8	
PFNS*	Not detected	9.9		ng/L	1.98	68259-12-1	
PFDODA*	Not detected	9.9		ng/L	1.98	307-55-1	
PFDS*	Not detected	9.9		ng/L	1.98	335-77-3	
PFTDA*	Not detected	9.9		ng/L	1.98	72629-94-8	
FOSA*	Not detected	9.9		ng/L	1.98	754-91-6	
PFTeDA*	Not detected	9.9		ng/L	1.98	376-06-7	
11Cl-PF3OUdS*	Not detected	9.9		ng/L	1.98	763051-92-9	
9Cl-PF3ONS*	Not detected	9.9		ng/L	1.98	756426-58-1	
ADONA*	Not detected	9.9		ng/L	1.98	919005-14-4	
HFPO-DA*	Not detected	9.9		ng/L	1.98	13252-13-6	

Merit Laboratories Login Checklist

Lab Set ID:S22480

Client:ARCADIS_NOVI (ARCADIS U.S., Inc.)

Project: 30075935.03200 / Buick City

Submitted:03/23/2021 15:10 Login User: SRS

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.	☒ Yes ☐ No ☐ N/A	Samples are received at 4C +/- 2C Thermometer # IR 2.6
02.	☒ Yes ☐ No ☐ N/A	Received on ice/ cooling process begun
03.	☐ Yes ☒ No ☐ N/A	Samples shipped
04.	☐ Yes ☒ No ☐ N/A	Samples left in 24 hr. drop box
05.	☐ Yes ☐ No ☒ N/A	Are there custody seals/tape or is the drop box locked
Chain of Custody		
06.	☒ Yes ☐ No ☐ N/A	COC adequately filled out
07.	☒ Yes ☐ No ☐ N/A	COC signed and relinquished to the lab
08.	☒ Yes ☐ No ☐ N/A	Sample tag on bottles match COC
09.	☐ Yes ☒ No ☐ N/A	Subcontracting needed? Subcontacted to:
Preservation		
10.	☐ Yes ☐ No ☒ N/A	Do sample have correct chemical preservation
11.	☐ Yes ☐ No ☒ N/A	Completed pH checks on preserved samples? (no VOAs)
12.	☐ Yes ☒ No ☐ N/A	Did any samples need to be preserved in the lab?
Bottle Conditions		
13.	☒ Yes ☐ No ☐ N/A	All bottles intact
14.	☒ Yes ☐ No ☐ N/A	Appropriate analytical bottles are used
15.	☒ Yes ☐ No ☐ N/A	Merit bottles used
16.	☒ Yes ☐ No ☐ N/A	Sufficient sample volume received
17.	☐ Yes ☒ No ☐ N/A	Samples require laboratory filtration
18.	☒ Yes ☐ No ☐ N/A	Samples submitted within holding time
19.	☐ Yes ☐ No ☒ 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: _____

REPORT TO

CHAIN OF CUSTODY RECORD

INVOICE 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		FAX NO.	P.O. NO.
E-MAIL ADDRESS Joey.Barker@arcadis.com		QUOTE NO.	

CONTACT NAME		SURNAME	
COMPANY			
ADDRESS			
CITY		STATE	ZIP CODE
PHONE NO.		E-MAIL ADDRESS	

PROJECT NO./NAME <u>300 75935.03200 / Brick city</u>	SAMPLER(S) - PLEASE PRINT/SIGN NAME <u>Donald Richmond / D. Richmond</u>
TURNAROUND TIME REQUIRED ☐ 1 DAY ☐ 2 DAYS ☐ 3 DAYS ☒ STANDARD ☐ OTHER _____	
DELIVERABLES REQUIRED ☐ STD ☐ LEVEL II ☐ LEVEL III ☐ LEVEL IV ☐ EDD ☐ OTHER _____	

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

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)									
# Containers & Preservatives NONE HCl HNO₃ H₂SO₄ NaOH MeOH OTHER PFAS									
Certifications ☐ OHIO VAP ☐ Drinking Water ☐ DoD ☐ NPDES Project Locations ☐ Detroit ☐ New York ☐ Other Special Instructions									

[illegible]

RELINQUISHED BY: SIGNATURE/ORGANIZATION	<i>D. Dineen / Arcadis</i>	☒ Sampler	DATE 3/23/21	TIME 1335
RECEIVED BY: SIGNATURE/ORGANIZATION	<i>JSA Miller</i>		DATE 3/23/21	TIME 1335
RELINQUISHED BY: SIGNATURE/ORGANIZATION	<i>JSA Miller</i>		DATE 3/23/21	TIME 15:00
RECEIVED BY: SIGNATURE/ORGANIZATION	<i>Sam Smith</i>		DATE 3/23/21	TIME 1510

RELINQUISHED BY:			DATE	TIME
SIGNATURE/ORGANIZATION				
RECEIVED BY:			DATE	TIME
SIGNATURE/ORGANIZATION				
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS	NOTES: TEMP. ON ARRIVAL <u>2.6</u>	
SEAL NO.	SEAL INTACT YES ☐ NO ☐	INITIALS		

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