

SUBJECT
RACER Buick City Sanitary Sewer PFAS Update
and Bulkhead Notification

TO
Grant Trigger, RACER Trust

DATE
November 12, 2021,

PROJECT NUMBER
30075935

COPIES TO
Chris Peters, Arcadis
Micki Maki, Arcadis

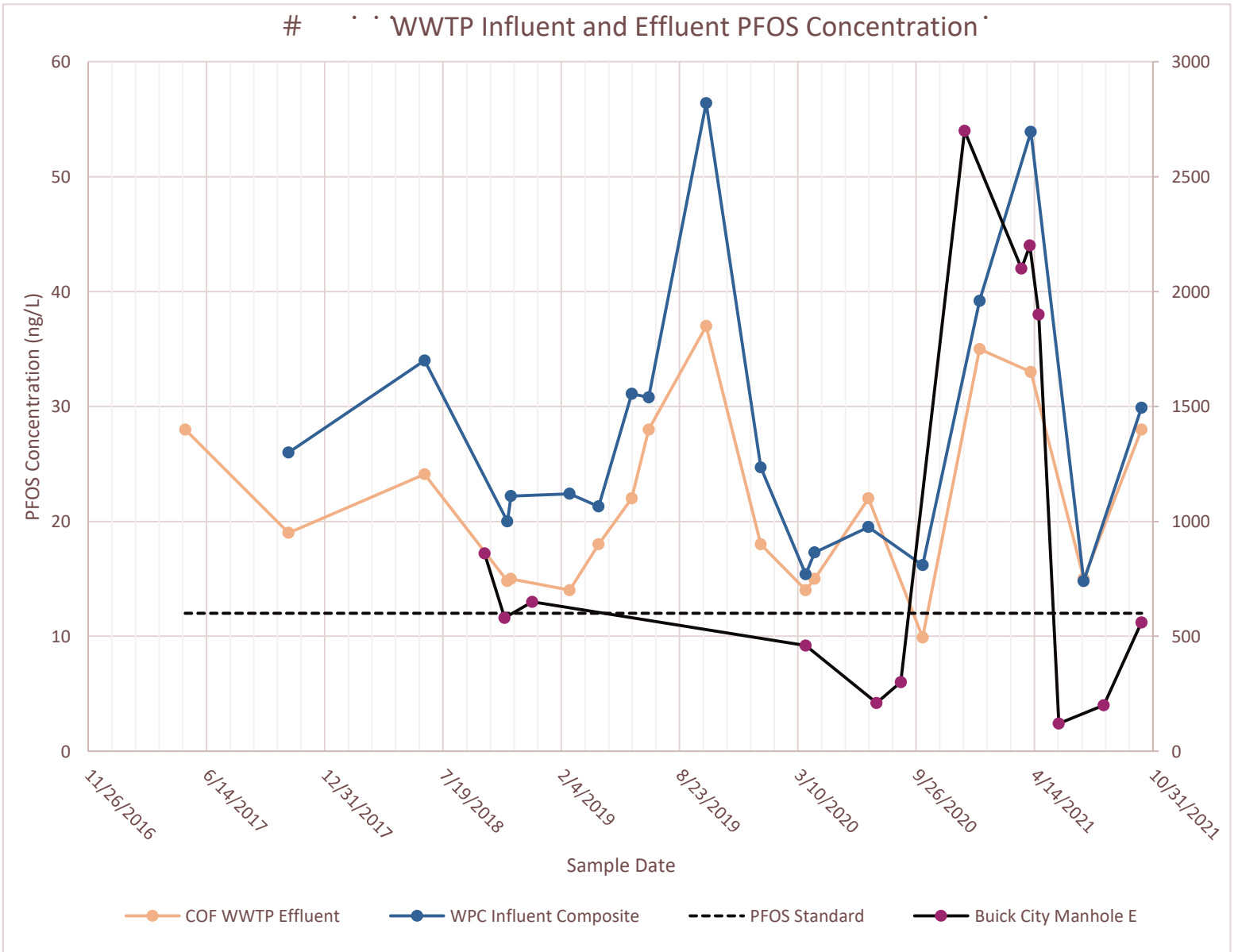
NAME
Tony Maffeo

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 sanitary sewer along Hamilton Avenue adjacent to the Site to prevent the discharge of PFAS into the City of Flint sanitary sewer system a series of samples were collected to over the past 5 months. Two water samples were collected from the sanitary sewer (Manhole MH E and MH E-1, **Figure 1**) on October 12, 2021.

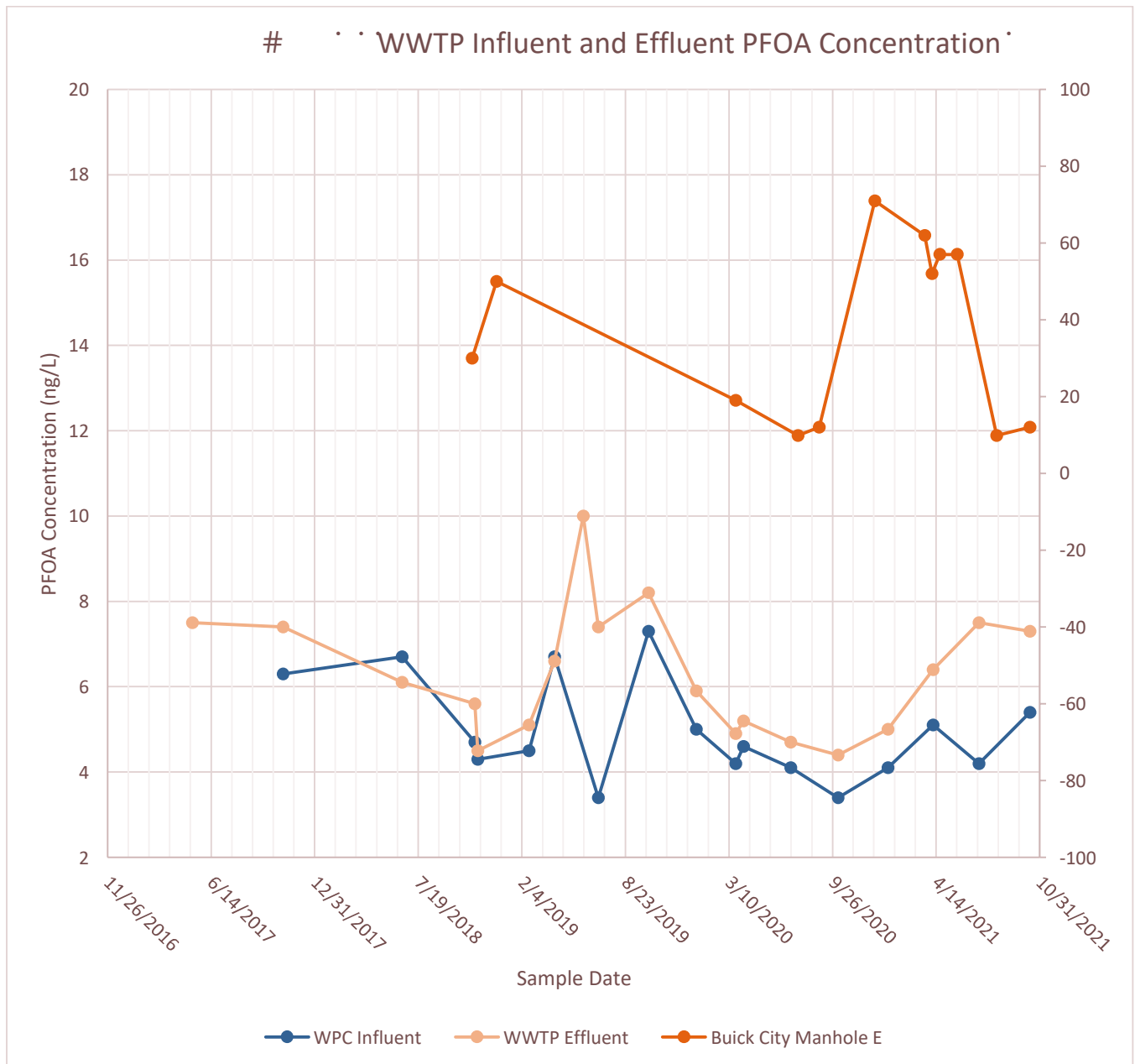
The analytical results from those samples are shown in the attached laboratory report (**Attachment A**). Concentration trend graphs (**Chart 1 and 2** displayed below) were also prepared to evaluate the relationship between the PFOS and PFOA levels in the Hamilton Avenue sanitary sewer and levels of PFOS and PFOA received at the City of Flint wastewater treatment plant (WWTP). Based on limited data the results are inconclusive through the end of 2019. However, the Increase in PFOS concentration at Manhole E-1 in October 2021 coincides with the higher levels of PFOS detected at the WWTP also in October 2021. On the other hand, a slight increase in PFOA at Manhole E-1 in October 2021 did not appear to affect 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 has shown a reduction at the City WWTP.

RACER had previously installed a temporary plug to block the sanitary sewer at Manhole E-1 on July 14, 2020. This resulted in a decrease in PFOS concentrations at Manhole E followed by a reduction at the City of Flint WWTP. On December 14, 2020, groundwater began daylighting at the surface on Site 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 on Site manholes with concrete, including storm sewer Manhole 10-5 (storm sewer).

New temporary plugs were installed in sanitary sewer manholes MH H-1 and MH H-1A on May 6, 2021 and have shown a reduction at the City of Flint WWTP as shown on **Chart 1 and 2**. Because the temporary plugs are having a positive effect on PFAS concentrations at the WWTP, RACER plans to move forward with the permanent bulkhead installation this month. Arcadis will coordinate the next sampling event with the City of Flint's quarterly sampling schedule.



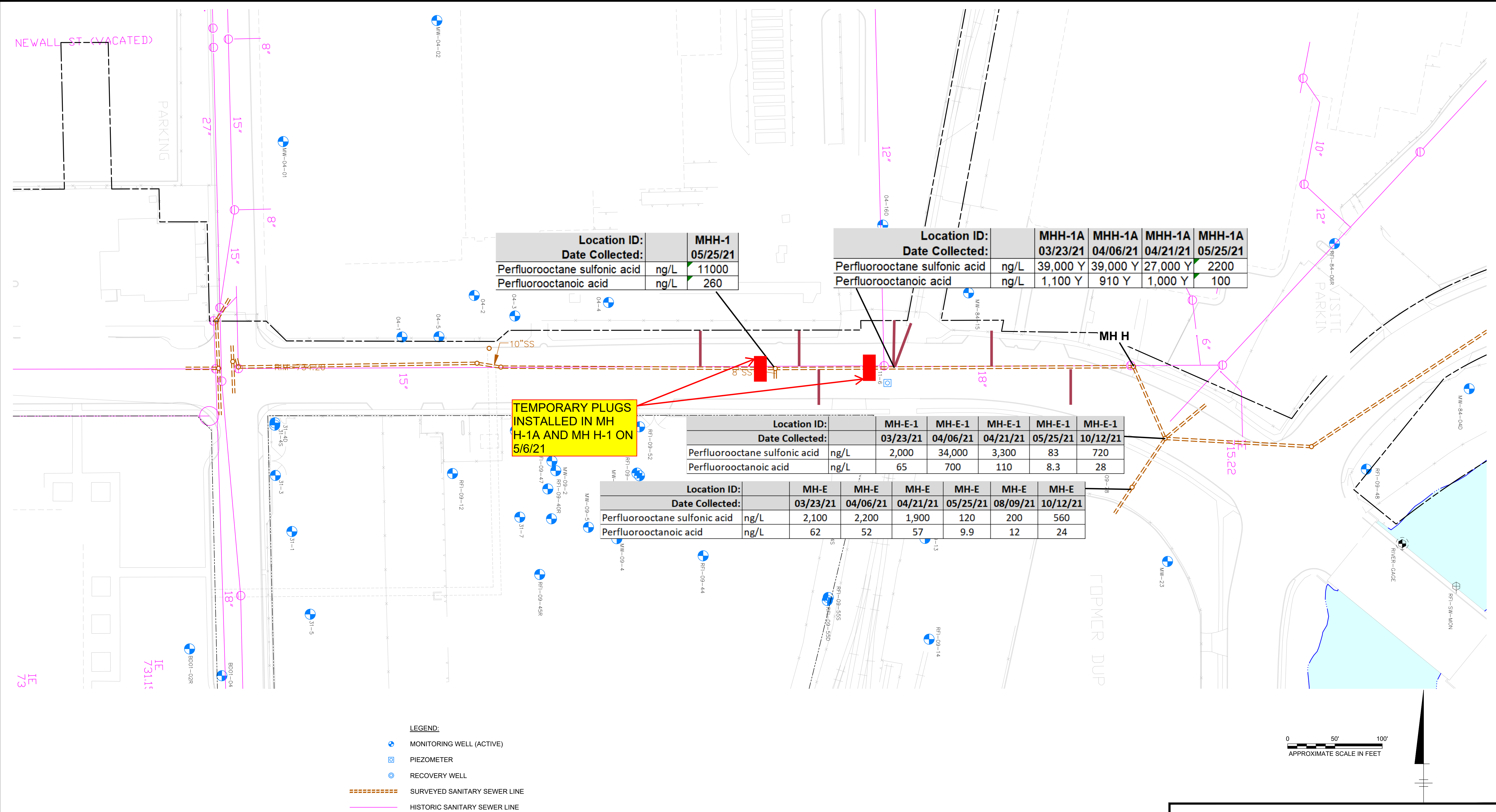
Note: Data from Buick City Manhole E is scaled on the right Y-axis



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 380 Docs\RACER TRUST\BUICK CITY RCRA\2019\10-DWG\RTBC-F-HAMILTON SANITARY SEWER.dwg LAYOUT: 3 SAVED: 17/2019 5:39 PM ACADVER: 21.05 (LMS TECH) PAGES: 17 PLOTTED: 17/2019 6:09 PM BY: SANCHEZ, ADRIAN



RACER TRUST
 BUICK CITY
 FLINT, MICHIGAN

**HAMILTON AVENUE SANITARY SEWER
 DATA FROM 3/23/21 THROUGH 10/12/21**

ARCADIS Design & Consultancy
 for natural and built assets

FIGURE
1

Attachment A
Analytical Reports



Analytical Laboratory Report

Report ID: S29237.01(01)
Generated on 10/29/2021

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, Alexis Crisp

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): S29237.01-S29237.02
Project: 30075935.03200 / Buick City
Collected Date(s): 10/12/2021
Submitted Date/Time: 10/12/2021 15:30
Sampled by: Donald Richmond
P.O. #: 30075935.03200

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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.

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



Analytical Laboratory 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



Analytical Laboratory Report

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-chloroeicosafuoro-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 (2 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S29237.01	MHE_101221	Groundwater	10/12/21 11:10
S29237.02	MHE-1_101221	Groundwater	10/12/21 11:25



Analytical Laboratory Report

Lab Sample ID: S29237.01

Sample Tag: MHE_101221

Collected Date/Time: 10/12/2021 11:10

Matrix: Groundwater

COC Reference: 140967

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	24.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.30/7.01/11	ASTMD7979-19M	10/21/21 08:00	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 10/25/21 19:50, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	21		ng/L	2.08	375-22-4	X
PFPeA*	14	4.2		ng/L	2.08	2706-90-3	
4:2 FTSA*	Not detected	2.1		ng/L	2.08	757124-72-4	
PFHxA*	48	2.1		ng/L	2.08	307-24-4	
PFBS*	36	2.1		ng/L	2.08	375-73-5	
PFHpA*	9.9	2.1		ng/L	2.08	375-85-9	
PFPeS*	32	2.1		ng/L	2.08	2706-91-4	
6:2 FTSA*	Not detected	4.2		ng/L	2.08	27619-97-2	
PFOA*	24	2.1		ng/L	2.08	335-67-1	
PFHxS*	340	2.1		ng/L	2.08	355-46-4	
PFHxS-LN*	280	2.1		ng/L	2.08	355-46-4-LN	
PFHxS-BR*	53	2.1		ng/L	2.08	355-46-4-BR	
PFNA*	4.9	2.1		ng/L	2.08	375-95-1	
8:2 FTSA*	Not detected	4.2		ng/L	2.08	39108-34-4	
PFHpS*	14	2.1		ng/L	2.08	375-92-8	
PFDA*	Not detected	2.1		ng/L	2.08	335-76-2	
N-MeFOSAA*	Not detected	2.1		ng/L	2.08	2355-31-9	
EtFOSAA*	Not detected	4.2		ng/L	2.08	2991-50-6	
PFOS*	560	2.1		ng/L	2.08	1763-23-1	
PFOS-LN*	330	2.1		ng/L	2.08	1763-23-1-LN	
PFOS-BR*	230	2.1		ng/L	2.08	1763-23-1-BR	
PFUnDA*	Not detected	2.1		ng/L	2.08	2058-94-8	
PFNS*	Not detected	2.1		ng/L	2.08	68259-12-1	
PFDODA*	Not detected	2.1		ng/L	2.08	307-55-1	
PFDS*	Not detected	2.1		ng/L	2.08	335-77-3	
PFTTrDA*	Not detected	2.1		ng/L	2.08	72629-94-8	
FOSA*	Not detected	2.1		ng/L	2.08	754-91-6	
PFTeDA*	Not detected	4.2		ng/L	2.08	376-06-7	
11Cl-PF3OUdS*	Not detected	2.1		ng/L	2.08	763051-92-9	
9Cl-PF3ONS*	Not detected	2.1		ng/L	2.08	756426-58-1	
ADONA*	Not detected	2.1		ng/L	2.08	919005-14-4	
HFPO-DA*	Not detected	10		ng/L	2.08	13252-13-6	

X-Elevated reporting limit due to matrix interference



Analytical Laboratory Report

Lab Sample ID: S29237.02

Sample Tag: MHE-1_101221

Collected Date/Time: 10/12/2021 11:25

Matrix: Groundwater

COC Reference: 140967

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	15ml Centrifuge Tube	None	Yes	24.1	IR

Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Initial wt. (g) / Final wt. (g) / Volume (ml)*	12.51/7.05/11	ASTMD7979-19M	10/21/21 08:00	KCV	

Organics

28 PFAs, Method: ASTMD7979-19M, Run Date: 10/25/21 20:09, Analyst: KCV

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
PFBA*	Not detected	20		ng/L	2.01	375-22-4	X
PFPeA*	17	4.0		ng/L	2.01	2706-90-3	
4:2 FTSA*	Not detected	2.0		ng/L	2.01	757124-72-4	
PFHxA*	60	2.0		ng/L	2.01	307-24-4	
PFBS*	41	2.0		ng/L	2.01	375-73-5	
PFHpA*	11	2.0		ng/L	2.01	375-85-9	
PFPeS*	42	2.0		ng/L	2.01	2706-91-4	
6:2 FTSA*	Not detected	4.0		ng/L	2.01	27619-97-2	
PFOA*	28	2.0		ng/L	2.01	335-67-1	
PFHxS*	360	2.0		ng/L	2.01	355-46-4	
PFHxS-LN*	310	2.0		ng/L	2.01	355-46-4-LN	
PFHxS-BR*	57	2.0		ng/L	2.01	355-46-4-BR	
PFNA*	4.0	2.0		ng/L	2.01	375-95-1	
8:2 FTSA*	Not detected	4.0		ng/L	2.01	39108-34-4	
PFHpS*	15	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*	720	2.0		ng/L	2.01	1763-23-1	
PFOS-LN*	430	2.0		ng/L	2.01	1763-23-1-LN	
PFOS-BR*	280	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	
PFTTrDA*	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 Login Checklist

Lab Set ID:S29237

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

Project: 30075935.03200 / Buick City

Submitted: 10/12/2021 15:30 Login User: JRM

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.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 24.1
02.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
Chain of Custody		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
Preservation		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab?
Bottle Conditions		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

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

Client Review By: _____ Date: _____



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 www.meritlabs.com

C.O.C. PAGE # 1 OF 1 140967

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

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

PROJECT NO./NAME 30075 935, 03200/Buick city SAMPLER(S) - PLEASE PRINT/SIGN NAME Donald Richmond / Dan Rich
 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

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO ₃	H ₂ SO ₄	NaOH	MeOH	OTHER	PFAS											
	DATE	TIME																						
<u>29237.01</u>	<u>10/12/21</u>	<u>1110</u>	<u>MHE-101221</u>	<u>GW</u>	<u>3</u>								<input checked="" type="checkbox"/>											
<u>.02</u>	<u>10/12/21</u>	<u>1125</u>	<u>MHE-1101221</u>	<u>GW</u>	<u>3</u>								<input checked="" type="checkbox"/>											