July 15, 2019

Ms. Stephanie Kammer
Water Resources Division - Lansing District Office
Michigan Department of Environment, Great Lakes and Energy
Constitution Hall
525 W. Allegan
Lansing, MI 48909-7742

Re: Short-Term Characterization Study
Response to NOV of March 13, 2019

Dear Stephanie:

Enclosed is our second report on the Short-Term characterization study. There are a number of factors that have impacted this work and our ability to collect the requested samples. First, high water levels in the Flint River have prevented wet weather sampling at outfalls 007, 007A, 008 and 012. In some cases, rain events occurred so close to each other there was no qualifying window to collect a wet weather sample for extended periods during May and June. Consequently, as the report notes, several samples were just collected on July 2 and most second round wet weather samples have yet be collected due to uncooperating weather conditions. We will continue to monitor for proper conditions to collect those samples.

We have drafted a new work plan (July Work Plan) to expand the site investigation work including more sampling to better define site conditions and look for possible means to reduce or eliminate the identified PFAS releases to the Flint River. It is clear further information is needed because we do not yet understand where the PFAS is coming from for all outfalls and what other sources may be contributing to the releases.

Also, further evaluation of the rain events during each wet weather sample collection event is needed to be better understood how to put these results in the proper context. Until this work is completed, we will not be able to fairly assess the required response at each outfall. However, given the large area served by the Outfall 013 storm sewer, it is apparent that we need to focus the next round of investigation on that line because it is possible it may be the most important outfall to address PFAS releases to the river.

With respect to each of the outfalls:

Outfall 001 – we have added to the July Work Plan additional sample locations within the storm sewer from the American Spiral Weld property to the river to search for possible sources of the PFAS.

Outfall 002 – Although no storm water from the Buick City site currently flows though this sewer it will be reconnected as part of the reroute to address the PFAS releases from Outfall 003. We are collecting

samples from monitoring wells along the property boundary downgradient of Factory 36 to determine if there are any impacts.

Outfall 003 - The results from Outfall 003 do not have any material impact on our course of action. The work on the reroute continues with an anticipated completion date of late 2019 or early 2020.

Outfall 004 – The initial limited sampling suggests that the Outfall 004 drainage area is not a source of PFAS – which if confirmed may suggest that the section of the Outfall 003 storm sewer that runs parallel to the Outfall 004 storm sewer will also not be a source of PFAS. If so, the reroute may result in a near zero release of PFAS from Outfall 003.

Outfall 004A – Is a very small drainage area – and may be suited to bulkheading.

Outfall 005 – This location is complicated due to drainage from a French drain behind the railroad bridge foundation and retaining wall and flow from the adjoining (non-RACER) property that is difficult to sample. The July Work Plan includes evaluation of laterals from the adjoining property to assist in assessing bulkhead options.

Outfall 005A – For all practical purposes this outfall does not serve RACER. The corner of RACER property that flows to this outfall was bulkheaded. There was no flow in dry weather and the wet weather sample was non-detect for PFOS.

Outfall 006 – Most of the outfall drainage area that drains to Outfall 006 is not on RACER property. Until further assessment is done it will not be understood where the PFAS in this outfall originates.

Outfalls 007, 007A, 008 and 012 - Weather conditions and high water levels in the river have prevented wet weather sampling.

Outfall 010 and 011 - PFAS detections for each are from small drainage areas. A review of possible contributions suggests further sampling from selected laterals are needed to determine if those should be bulkheaded. That is the focus of the work described in the July Work Plan.

Outfall 013 - Given the most recent sample result (PFOS at 630 ppt) and the large drainage area for this outfall it is possible this may be the most significant source of PFAS to the river. Consequently, further sampling to better understand this sewer line and the possible source of PFAS is an important next step and that sampling is outlined in the July Work Plan. This work should begin the week of July 15.

Due to weather conditions the full scope of the requested sampling has not been possible. I suggest that we implement the July Work Plan and consider based on that information plus the analytical results from the most recent sampling what the next steps may be and under what priority once we have better information. Given the time required to schedule field crews, laboratory turn around time, and evaluation time we should be able provide an update by October 1. If necessary, we can schedule an interim status discussion if that is needed.

In the meantime, we will sort out bulkheading options for Outfall 004A drainage area and continue with the work necessary to implement the 003 reroute. City of Flint engineering review of the design needs to be completed and the materials management plan needs to be completed and approved for

that work to advance. We also continue to work with the City on the assessment of PFAS in the sanitary sewer line and how to best address that issue. Follow up field work related to that effort should begin the week of July 15 and the additional sampling proposed in the July Work Plan will proceed as weather conditions allow.

If you have any further questions, please let me know.

Sincerely,

Grant R. Trigger
Michigan Cleanup Manager

cc: Chris Black, USEPA
Al Taylor, EGLE
Kevin Lund, EGLE
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ARCADIS Design & Consultancy for natural and built assets

Revitalizing Auto Communities Environmental Response Trust (RACER)

SHORT-TERM CHARACTERIZATION STUDY OF DISCHARGES FROM OUTFALLS FOR PFAS

RACER Buick City Site

July 15, 2019

SHORT-TERM CHARACTERIZATION STUDY OF DISCHARGES FROM OUTFALLS FOR PFAS

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Our Ref.:
B0064410.2019

Date:
July 15, 2019

CONTENTS

TABLE

FIGURE

1 INTRODUCTION

This report presents a summary of sampling activities completed to date as part of the required short-term characterization study for per- and poly-fluoroalkyl substances (PFAS) at the Outfalls associated with the Buick City Site (Site) located in Flint, Michigan. As discussed in further detail below, the sampling is only partially completed (weather issues have interfered) and therefore a full assessment of the meaning/significance of the data has not been completed. For example, the influence of different size (intensity and duration) rain events on the implications from this round of data needs to be considered. The July PFAS Status Update and Work Plan (July Work Plan) includes focused follow up samples to help in this effort including within Outfall Drainage Area 013. We can expect to offer a more comprehensive assessment of this information when further data has been collected.

On March 13, 2019 the Michigan Department of Environmental Quality (now Environment, Great Lakes, & Energy [EGLE]) requested a Short-Term Characterization Study of Discharges from Outfalls for PFAS for the RACER Buick City Site. EGLE required PFAS analysis of storm water discharges from two wet weather qualifying events for all outfalls associated with the Buick site and storm water discharges for all outfalls that have baseflow during dry weather conditions. The letter also requested copies of the analytical reports from the contract laboratory for all storm water samples previously collected during the October 2018 and November/December 2018 sampling events.

This report presents a summary of the sampling conducted from November 2018 to June 2019 and includes the results from the most recent samples collected on June 5.

The requested analytical laboratory reports were submitted to Stephanie Kammer via email on March 21, 2019. The sampling events and analytical data are discussed further below.

As indicated on **Table 1**, additional wet and dry weather samples are needed to complete the required sampling. As discussed below, conditions enabling the completion of the sampling have not been present thus far.

2 PFAS SAMPLING

2.1 Sampling Issues

Several issues were encountered while trying to complete the requested sampling as summarized below.

2.1.1 High River Level

Due to the unusually high amount of precipitation received this spring, the level of the Flint River rose so that several of the outfalls became submerged and are unable to be sampled. Alternate sampling locations were proposed to EGLE for approval. Alternate locations were typically one manhole upgradient of the outfall, but at select outfalls (004, 011, 013) the samples were collected from manholes further upgradient due to stagnant water /backflow from the river and/or access issues. However, four outfalls

(007, 007A, 008, and 012) do not have alternate locations; therefore, sampling cannot be completed until the river level declines.

2.1.2 Wet Weather

The weather during spring and early summer 2019 made it difficult to collect the dry and wet weather samples per EGLE requirements. A qualifying wet weather event is defined as a storm causing a discharge with greater than 0.1 inch of rainfall that occurs at least 72 hours after the previous measurable storm event that also caused a discharge. A qualifying dry weather event for baseflow conditions needs to be completed a minimum of 48 hours after any rain event. The weather during the study period frequently had precipitation for several days in a row, or every other day, which made it difficult to find qualifying rain events, or periods of dry weather long enough to collect the samples.

2.2 Sampling Summary

To date, dry weather samples have been collected from all outfalls with dry weather flow; however, the last samples were collected on 6/28/19 and the results are not due from the laboratory until early August.

One round of wet weather samples was collected from each of the outfalls that were not submerged (as discussed in Section 2.1.1) and a second round of wet weather samples was collected from four locations (**Table 1**). The analytical results of samples collected on 7/2/19 are not due from the laboratory until mid-August.

2.3 Sample Results

This section summarizes the PFAS sampling conducted to date at each outfall and next steps. **Table 1** presents a summary of outfalls sampled (and upstream manholes when outfalls cannot be sampled) to date, PFOA and PFOS sampling results, and pending data. **Figure 1** presents the sample locations.

2.3.1 Outfall 001

- Dry Weather Sampling – One dry weather sample was collected from Outfall 001 on 4/3/19 from Outfall 001. The analytical results detected perfluorooctanoic acid (PFOA) at a concentration of 32 nanograms per liter (ng/L) and perfluorooctane sulfonate (PFOS) at 30 ng/L.
- Wet Weather Sampling – The first wet weather sample was collected from Outfall 001 on 4/29/19. The analytical results detected PFOA at a concentration of 6.2 ng/L and PFOS at 7.9 ng/L. The second wet weather sample was collected from Outfall 001 on 7/2/19. Analytical results are expected in early to mid-August.
- Next Steps –
    - Evaluate data from second round of wet weather sampling.
    - Conduct additional dry weather sampling along the Outfall 001 storm sewer to further evaluate potential PFAS sources as proposed in the July Work Plan.

2.3.2 Outfall 002

- Dry Weather Sampling – One dry weather sample was collected from manhole MH 2-1 on 6/28/19. Analytical results are expected in early August.
- Wet Weather Sampling – The first wet weather sample was collected from manhole MH 2-1 on 7/2/19.
- Next Steps –
    - Complete second round of wet weather sampling and evaluate wet and dry weather data.

2.3.3 Outfall 003

- Dry Weather Sampling – One dry weather sample was collected from Outfall 003 on 11/20/18. PFOA was detected at a concentration of 10 ng/L and PFOS at 120 ng/L. In addition, a total of 15 dry weather samples have been collected from 13 locations along the Outfall Drainage Area 003 storm sewer. The analytical results for PFOA and PFOS reveal varying levels of PFAS for most of the length of the 003 main sewer line without identifying a primary source area.
- Wet Weather Sampling – The first wet weather sample was collected from manhole MH 3-1 on 6/5/19. The analytical results detected PFOA at a concentration of 10 ng/L and PFOS at 60 ng/L. The second wet weather sample was collected from manhole MH 3-1 on 7/2/19. Analytical results are expected in early to mid-August.
- Next Steps –
    - Evaluate second round of wet weather sample data.
    - In June a flow meter was installed at manhole MH 3-1 to monitor dry and wet weather flow. Once the flow study is complete, the flow data will be used in conjunction with the analytical data to calculate the dry and wet weather mass loading of PFOA/PFOS at Outfall 003 and to aid in prioritizing addressing impacts at the Site.
    - The Outfall 003 storm sewer reroute remedy design is ongoing and remedy implementation is expected in late 2019/early 2020.

2.3.4 Outfall 004

- Dry Weather Sampling –No dry weather flow was observed at Outfall 004 during the inspection completed on 4/3/19.
- Wet Weather Sampling – The first wet weather sample was collected from manhole MH 4-2 on 6/5/19. The analytical results did not detect PFOA and detected PFOS at a concentration of 1.8 ng/L.
- Next Steps –
    - Collect and evaluate second round of wet weather sample data

2.3.5 Outfall 004A

- Dry Weather Sampling –No dry weather flow was observed at Outfall 004A during the inspection completed on 4/3/19.
- Wet Weather Sampling – The first wet weather sample was collected from manhole MH 4A-1 on 6/5/19. The analytical results detected PFOA at a concentration of 12 ng/L and PFOS at 46 ng/L.
- Next Steps –
    - Collect and evaluate second round of wet weather sample data.
    - Evaluate bulkheading all or a portion of the 004A storm sewer.

2.3.6 Outfall 005

- Dry Weather Sampling – Two dry weather samples were collected from Outfall 005: on 11/19/18 and 2/27/19. The analytical results detected PFOA at concentrations ranging from non-detect to 13 ng/L and PFOS at concentrations ranging from 45 to 50 ng/L. In addition, a total of 10 dry weather samples have been collected eight locations along the Outfall Drainage Area 005 storm sewer. The analytical results for PFOA and PFOS were similar to the concentrations detected at Outfall 005, with the exception of the samples collected from the P-traps, which funnel water from a french drain to the Outfall drainage area 005 storm sewer. In the P-traps PFOA was detected at concentrations ranging from 19 to 24 ng/L and PFOS concentrations ranging from 160 to 230 ng/L.
- Wet Weather Sampling – The first wet weather sample was collected from manhole MH 5-1 on 6/5/19. The analytical results detected PFOA at a concentration of 11 ng/L and PFOS at 51 ng/L.
- Next Steps –
    - Collect and evaluate second round of wet weather sample data.
    - In June a flow meter was installed at manhole MH 5-1 to monitor dry and wet weather flow. Once the flow study is complete, the flow data will be used in conjunction with the analytical data to calculate the dry and wet weather mass loading of PFOA/PFOS at Outfall 005 and to aid in prioritizing addressing impacts at the Site.
    - The adjacent property has several laterals which also discharge to the Outfall 005 storm sewer. Sampling of the laterals was attempted; however, the laterals could not be sampled. Additional evaluation of laterals will be completed.
    - A bulkhead remedy is currently being evaluated to address the impacts.

2.3.7 Outfall 005A

- Dry Weather Sampling – No dry weather flow was observed at Outfall 005A during the inspection completed on 4/3/19.

- Wet Weather Sampling – The first wet weather sample was collected from Outfall 005A on 4/29/19. The analytical results detected PFOA at a concentration of 0.86 J ng/L and PFOS was not detected.
- Next Steps –
    - Collect and evaluate second round of wet weather sample data.

2.3.8 Outfall 006

- Dry Weather Sampling – One dry weather sample was collected from Outfall 006 on 4/3/19. The analytical results detected PFOA at a concentration of 13 ng/L and PFOS at 96 ng/L.
- Wet Weather Sampling – The first wet weather sample was collected from Outfall 006 on 4/29/19. The analytical results detected PFOA at a concentration of 2.8 ng/L and PFOS at 11 ng/L.
- Next Steps –
    - Collect and evaluate data from second round of wet weather sampling.
    - Conduct additional dry weather sampling along the Outfall 006 storm sewer to further evaluate potential PFAS sources as proposed in the July Work Plan.

2.3.9 Outfall 007

- Dry Weather Sampling – No dry weather flow was observed at Outfall 007 during the inspection completed on 4/3/19.
- Wet Weather Sampling – Wet weather samples have not been collected due to high river levels and a lack of alternate sampling locations.
- Next Steps –
    - Collect and evaluate two rounds of wet weather sample data.

2.3.10 Outfall 007A

- Dry Weather Sampling – No dry weather flow was observed at Outfall 007A during the inspection completed on 4/3/19.
- Wet Weather Sampling – Wet weather samples have not been collected due to high river levels and a lack of alternate sampling locations.
- Next Steps –
    - Collect and evaluate two rounds of wet weather sample data.

2.3.11 Outfall 008

- Dry Weather Sampling – No dry weather flow was observed at Outfall 008 during the inspection completed on 4/3/19.

- Wet Weather Sampling – Wet weather samples have not been collected due to high river levels and a lack of alternate sampling locations.
- Next Steps –
    - Collect and evaluate two rounds of wet weather sample data.

2.3.12 Outfall 010

- Dry Weather Sampling – One dry weather sample was collected from Outfall 010 on 2/28/19. The analytical results detected PFOA at a concentration of 200 ng/L and PFOS at a concentration of 2,000 ng/L.
- Wet Weather Sampling – The first wet weather sample was collected from manhole MH 10-1 on 6/5/19. The analytical results detected PFOA at a concentration of 150 ng/L and PFOS at 1,500 ng/L. The second wet weather sample was collected on 7/2/19 and analytical results are expected in early to mid-August.
- Next Steps –
    - Evaluate second round of wet weather sample data.
    - In June a flow meter was installed at manhole MH 10-1 to monitor dry and wet weather flow. Once the flow study is complete, the flow data will be used in conjunction with the analytical data to calculate the dry and wet weather mass loading of PFOA/PFOS at Outfall 010 and to aid in prioritizing addressing impacts at the Site.
    - Collect additional samples along Outfall Drainage Area 010 storm sewer to evaluate additional laterals identified during survey and video investigations
    - A bulkhead remedy is currently being evaluated to address the impacts.

2.3.13 Outfall 011

- Dry Weather Sampling – One dry weather sample was collected from Outfall 011 on 2/27/19. The analytical results detected PFOA at a concentration of 10 ng/L and PFOS at a concentration of 100 ng/L. In addition, a total of six dry weather samples have been collected four locations along the Outfall Drainage Area 011 storm sewer. The samples collected from the laterals at manholes MH 11-6-A-6 and MH 11-6-A-8 detected PFOS at concentrations of 1,660 and 670 ng/L, respectively. PFOA was detected at a concentration of 80 ng/L at both locations.
- Wet Weather Sampling – The first wet weather sample was collected from manhole MH 11-6 on 6/5/19. The analytical results detected PFOA at a concentration of 7.2 ng/L and PFOS at 70 ng/L. Previous dry weather samples collected from manhole MH 11-6 detected PFOA at concentrations up to 10 ng/L and PFOS at concentrations ranging from 70 to 80 ng/L.

  The second wet weather sample was collected on 7/2/19 and analytical results are expected in early to mid-August.

- Next Steps –
    - Evaluate second round of wet weather sample data.
    - Collect additional samples along Outfall Drainage Area 011 storm sewer to evaluate additional laterals identified during survey and video investigations
    - A bulkhead remedy is currently being evaluated to address the impacts.

2.3.14 Outfall 012

- Dry Weather Sampling – No dry weather flow was observed at Outfall 012 during the inspection completed on 4/3/19.
- Wet Weather Sampling – Wet weather samples have not been collected due to high river levels and a lack of alternate sampling locations.
- Next Steps –
    - Collect and evaluate two rounds of wet weather sample data.

2.3.15 Outfall 013

- Dry Weather Sampling – A dry weather sample was collected from manhole MH 13-2 on 6/28/19. Analytical results are expected in early August.
- Wet Weather Sampling – The first wet weather sample was collected from manhole MH 13-2 on 6/5/19. The analytical results detected PFOA at a concentration of 37 ng/L and PFOS at 630 ng/L.
- Next Steps –
    - Evaluate dry weather sample data.
    - Collect and evaluate second round of wet weather sampling data.
    - Review existing flow monitoring data from prior reroute of outfall sewer 004 and assess need for additional flow monitoring.
    - Collect additional dry weather samples along Outfall Drainage Area 013 storm sewer to evaluate potential PFAS sources as proposed in the July Work Plan.

2.4 Discussion of Sample Results

Analysis of the sample results is ongoing and the June 5, 2019 wet weather data was only received this week. The wet weather samples collected on June 5 appear inconsistent with normal expectations relative to the dry weather samples and the wet weather samples collected on April 29, 2019 (see **Table 1**). If these samples are an outlier that may be revealed after the second round of wet weather samples which have not been collected in some cases or analyzed. The total rainfall during the June 5 event was significantly less than the April 29 event, which may help explain the difference in results. Arcadis will

continue to review the rainfall data (intensity and duration) and provide a more detailed assessment when the final report containing all the wet and dry weather sample data is completed.

TABLES

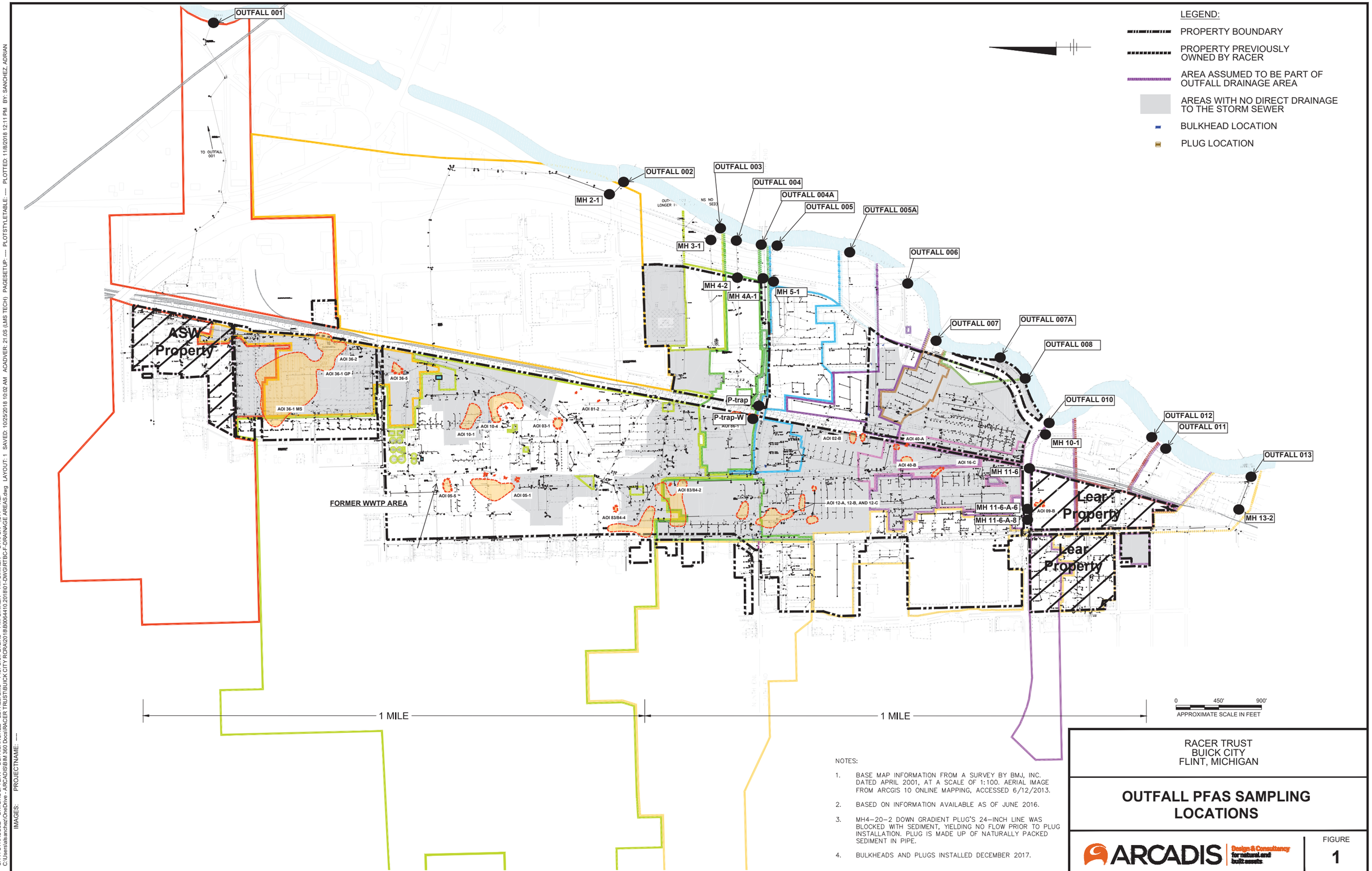
Table 1 - Outfall Sampling Status Summary Table
RACER Trust, Buick City Site, Flint, Michigan

Originally Published: 5/16/19
Updated: 7/15/2019

	Dry Weather			Wet Weather								
Outfall	Sampling Status	Date Sampled	Result (Collected from Outfall unless otherwise noted)	Wet Weather Sampling Status	Sample Collection Date - Round 1	Total Rain Round 1	Wet Weather Result - Round 1	Sample Collection Date - Round 2	Total Rain Event 2	Wet Weather Result - Round 2	Alternate Sampling Locations	First Priority Locations
001	Completed	4/3/19	PFOA - 32 ng/L PFOS - 30 ng/L	Completed	4/29/2019	0.52"	PFOA - 6.2 ng/L PFOS - 7.9 ng/L	7/2/2019	0.17"	--	--	
002	Sample Collected	6/28/19	NA	Round 1 Completed	7/2/2019	0.17"	--	--	NA	--	MH 2-1	X
003	Completed	11/20/18	PFOA - 10 ng/L PFOS - 120 ng/L	Completed	6/5/19	0.23"	PFOA - 10 ng/L PFOS - 60 ng/L	7/2/2019	0.17"	--	MH 3-1	X
004	Completed	4/3/19	DRY	Round 1 Completed	6/5/19	0.23"	PFOA - ND PFOS - 1.8 ng/L	--	NA	--	MH 4-2	
004A	Completed	4/3/19	DRY	Round 1 Completed	6/5/19	0.23"	PFOA - 12 ng/L PFOS - 46 ng/L	--	NA	--	MH 4A-1	
005	Completed	11/19/18 2/27/19	PFOA - 10 ng/L PFOS - 50 ng/L	Round 1 Completed	6/5/19	0.23"	PFOA - 11 ng/L PFOS - 51 ng/L	--	NA	--	MH 5-1	
005A	Completed	4/3/19	DRY	Round 1 Completed	4/29/19	0.52"	PFOA - 0.86 JI ng/L PFOS - ND	--	NA	--	--	
006	Completed	4/3/19	PFOA - 13 ng/L PFOS - 96 ng/L	Round 1 Completed	4/29/19	0.52"	PFOA - 2.8 ng/L PFOS - 11 ng/L	--	NA	--	--	
007	Completed	4/3/19	DRY	Waiting on river level to drop	NA	NA	--	--	NA	--	--	
007A	Completed	4/3/19	DRY	Waiting on river level to drop	NA	NA	--	--	NA	--	--	
008	Completed	4/3/19	DRY	Waiting on river level to drop	NA	NA	--	--	NA	--	MH 8-1	
010	Completed	2/28/19	PFOA - 200 ng/L PFOS - 2,000 ng/L	Compelted	6/5/19	0.23"	PFOA - 150 ng/L PFOS - 1,500 ng/L	7/2/2019	0.17"	--	MH 10-1	X
011	Completed	2/27/19	PFOA - 10 ng/L PFOS - 100 ng/L	Completed	6/5/19	0.23"	PFOA - 7.2 ng/L PFOS - 70 ng/L	7/2/2019	0.17"	--	MH 11-6	X
012	Completed	4/3/19	DRY	Waiting on river level to drop	NA	NA	--	--	NA	--	--	
013	Sample Collected	6/28/19	NA	Round 1 Completed	6/5/19	0.23"	PFOA - 37 ng/L PFOS - 630 ng/L	--	NA	--	MH 13-2	X

J - Result is less that the RL but greater than or equal to the MDL and the concentration is an approximate value
I - Value is the estimated mazximum possible concentration

FIGURES



NOTES:

1. BASE MAP INFORMATION FROM A SURVEY BY BMJ, INC. DATED APRIL 2001, AT A SCALE OF 1:100. AERIAL IMAGE FROM ARCGIS 10 ONLINE MAPPING, ACCESSED 6/12/2013.
2. BASED ON INFORMATION AVAILABLE AS OF JUNE 2016.
3. MH4–20–2 DOWN GRADIENT PLUG'S 24–INCH LINE WAS BLOCKED WITH SEDIMENT, YIELDING NO FLOW PRIOR TO PLUG INSTALLATION. PLUG IS MADE UP OF NATURALLY PACKED SEDIMENT IN PIPE.
4. BULKHEADS AND PLUGS INSTALLED DECEMBER 2017.

RACER TRUST
BUICK CITY
FLINT, MICHIGAN

OUTFALL PFAS SAMPLING LOCATIONS

ARCADIS Design & Consultancy for natural and built assets

FIGURE 1

CITY: SYRACUSE DIV/GROUP: ENV DB: A.SANCHEZ LD: ALS/GMS PIC: C.S.PETERS PM: C.KIKER TM: C.KIKER LYR: ON=*;OFF=*REF*
C:\Users\alsanchez\OneDrive - ARCADIS\BIM 360 Docs\RACER TRUST\BUICK CITY RCRA\2018\B0064410.2018\01-DWG\RTBC-F-DRAINAGE AREAS.dwg LAYOUT: 1 SAVED: 10/25/2018 10:02 AM ACADVER: 21.0S (LMS TECH) PAGESETUP: ---- PLOTSTYLETABLE: ---- PLOTTED: 11/8/2018 12:11 PM BY: SANCHEZ, ADRIAN
IMAGES: PROJECTNAME: ----

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