

Investigation of Per- and Polyfluoroalkyl Substances (PFAS)
in the Huron River Watershed
Surface Water Sampling Update
May 2019

The Michigan Department of Environment, Great Lakes, and Energy (EGLE), Water Resources Division (WRD), Surface Water Assessment Section (SWAS) conducted surface water sampling in the Huron River watershed in April 2019. This effort was initiated to continue to track potential sources of PFAS in the Huron River watershed. This included new sampling in Horseshoe Creek, more intensive sampling in Willow Run, and follow-up sampling in Pettibone Creek. Follow-up sampling in Norton Creek and the Huron River around Wixom was conducted to evaluate progress in that area. Lastly, samples were collected on the Lake Sherwood outlet and Honey Creek (Washtenaw County) and a Honey Creek tributary to follow-up on foam reports in those areas.

Michigan has developed Rule 57 surface water quality values for the protection of human health for both PFOS and PFOA. The Human Non-Cancer Value (HNV) for PFOS is 12 ng/L (parts per trillion) in surface water not used as a source of drinking water, and 11 ng/L for those waters used as a drinking water source. The HNV for PFOA is 420 ng/L and 12,000 ng/L for drinking and non-drinking water, respectively.

Surface water grab samples and two outfall samples were collected by WRD from the Huron River watershed April 29-30, 2019 (Figure 1). Samples from Willow Run and Honey Creek (Washtenaw County) were collected on April 29, 2019. Samples from Horseshoe Creek, Pettibone Creek, Norton Creek, and the Huron River were collected on April 30, 2019. Samples were collected in accordance with the Michigan Per- and Polyfluoroalkyl Substances (PFAS) Sampling Guidance¹ and MDEQ Surface Water PFAS Sampling Guidance document². QA/QC procedures followed the Michigan Surface Water PFAS Investigation 2018 QAPP³.

Findings:

- PFOS was detected in samples from 12 sites. Concentrations greater than the detection limit ranged from 3.7 ng/L to 92 ng/L.
- PFOS exceeded the HNV at five sites (Table 1; bold values).
- Samples collected in Horseshoe Creek (Figure 2), Hamburg Lake (Figure 2), and Pettibone Creek (Figure 3) were non-detect for PFOS (Table 1).
- Samples collected from Norton Creek downstream of the Wixom wastewater treatment plant (NC0010 and NC0100) exceeded the HNV (Table 1 and Figure 3) but were lower than previous samples collected in 2018.
- Concentrations of PFOS exceeded the HNV in Willow Run (WR0010 and WRW0100; Table 1 and Figure 4). WR0010 had a similar concentration to a previous sample collected in 2018.
- PFOS in outfall sample WROF002 (on main stem of Willow Run) was 92 ng/L and exceeded the HNV (Table 1).

¹ Michigan Department of Environmental Quality (MDEQ). 2018. General Per- and Polyfluoroalkyl Substances (PFAS) Sampling Guide.

² MDEQ. 2018. Michigan Department of Environmental Quality Surface Water PFAS Sampling Guidance.

³ MDEQ. 2018. Michigan Surface Water Perfluoroalkyl and Polyfluoroalkyl Compound (PFAS) Investigation: Quality Assurance Project Plan (QAPP).

- A follow-up sample from the west branch of Norton Creek (NCW0100) was below the HNV (non-detect for PFOS; Table 1 and Figure 3). In August 2018, the HNV was exceeded at NCW0100 with 80 ng/L PFOS.
- Samples collected in response to public foam observations in a tributary to Honey Creek (Washtenaw County; HCT1000; Figure 5) and the Lake Sherwood tributary to the Huron River (LST0050; Figure 3) were below the HNV for PFOS (Table 1).
- PFOA values were all below the HNV and ranged from non-detect to 9.9 ng/L (Table 1).
- PFOS and PFOA concentrations in the equipment blanks, trip blanks, and field blanks were non-detect (Table 1).

Overall, these results suggest that ambient PFOS concentrations in Norton Creek, downstream of the Wixom WWTP continue to remain low relative to findings from earlier sampling efforts. There may be potential sources of PFAS in Willow Run upstream of the I-94 Service Drive, in the west tributary of Willow Run, and at outfall WROF002. This one-time sampling event did not find any potential sources in Hamburg Lake, Horseshoe Creek, or the outlet of Lake Sherwood.

Previously low concentrations in Pettibone Creek were confirmed by this sampling event. In addition, fish collected from Pettibone Creek further upstream in a separate effort had low concentrations of PFAS. Based on the weight of evidence we believe elevated surface water concentrations measured in the August 2018 sampling event may have been due to a sample mix-up at the analytical laboratory.

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Table 1: PFOS concentrations (ng/L) in surface water samples collected from the Huron River watershed in April 2019. Bold values indicate a concentration that exceeded the HNV. Columns with two numbers include the original sample and a replicate or duplicate. R = replicate; D = duplicate; ND = non-detect; J = below reporting limit, but above method detection limit; US = upstream; DS = downstream; WWTP = wastewater treatment plant; WB = west branch; EB = east branch; SB = south branch; SW = storm water.

Sample ID	Description	Latitude	Longitude	Date sampled	PFOS (ppt)	PFOA (ppt)	Additional Description
Horseshoe Creek (HSC)							
HSC0050	At Merrill Road (Manly Bennett Park)	42.452988	-83.82143	4/30/2019	ND	ND	US of confluence with Huron River
HSC0100	At Hamburg Road	42.448	-83.80231	4/30/2019	ND	ND	DS of old landfills and Key Plastics Fire
HSC0300 ^P	At Northfield Twp. WWTP driveway	42.435968	-83.78170	4/30/2019	ND ND	ND ND	DS WWTP outfall; US Key Plastics Fire and old landfills
HSC0400	At 8 Mile Road	42.428915	-83.77776	4/30/2019	ND	ND	US WWTP outfall, old landfills, and Key Plastics fire; DS of Woodbridge Foam Plant
HSC0500	At Barker Road	42.422578	-83.76631	4/30/2019	ND	ND	US Woodbridge Foam Plant
HSC0600	At Schrum Drive	42.404247	-83.75929	4/30/2019	ND	ND	DS Horseshoe Lake
Hamburg Lake							
Hamburg Lake 0010	Hamburg Lake	42.432858	-83.79534	4/30/2019	ND	3.2 ^J	Historical Key Plastics Fire on Northeast side of lake
Lake Sherwood Trib (LST)							
LST0050	Lake Sherwood West Trib at Sleeth Rd.	42.581685	-83.5543	4/30/2019	ND	ND	Outlet from Lake Sherwood
Pettibone Creek (PC)							
PC0010	PC at Liberty St. (DS Mill Pond)	42.58944	-83.60277	4/30/2019	ND	ND	(Repeat sample)
Norton Creek (NC)							
NCW0100	WB NC at E Maple Rd.	42.53542	-83.55863	4/30/2019	ND	ND	(Repeat sample)
NC0010	NC US Huron River	42.57256	-83.57001	4/30/2019	13	2.7 ^J	US of confluence with Huron River; DS Wixom WWTP (Repeat sample)
NC0100 ^R	NC at E Buno Rd.	42.5527	-83.56223	4/30/2019	13 8.7	ND ND	DS Wixom WWTP (Repeat sample)
NC0400	NC at West Maple Rd.	42.53142	-83.54761	4/30/2019	ND	ND	DS Wixom Assembly; US Wixom WWTP (Repeat sample)
NC0600	NC at Grand River Ave	42.50248	-83.5731	4/30/2019	ND	ND	US Wixom Assembly (Repeat sample)

Table 1 (cont.)

Sample ID	Description	Latitude	Longitude	Date sampled	PFOS (ppt)	PFOA (ppt)	Additional Description
Huron River (HR)							
HR0185	Behind Edgelake Drive	42.450331	-83.83189	4/30/2019	4.4 ^J	ND	DS confluence with Horseshoe Creek, US Strawberry Lake
HR0190	HR US Strawberry Lake	42.46031	-83.82491	4/30/2019	6.4 ^J	ND	DS Ore Creek, US Horseshoe Creek
HR0240	HR at Wixom Rd	42.57425	-83.5599	4/30/2019	ND	ND	US of confluence with Norton Creek
HR0235	HR at Burns Rd	42.5787	-83.58002	4/30/2019	ND	ND	DS of confluence with Norton Creek
Honey Creek (Washtenaw County)							
HC0100	HC at Wagner Rd	42.31808	-83.79538	4/29/2019	ND	ND	(Repeat sample)
HCT1000	HC Trib behind Stowe St	42.296049	-83.795302	4/29/2019	7.0	ND	Access from 3424 Stowe Street
Willow Run (WR)							
WR0010 ^R	WR at service drive	42.2193	-83.53661	4/29/2019	33 32	3.6 ^J 5.8 ^J	US Confluence with Belleville Lake; DS Willow Run Airport (outfalls 007, 001, 002a, 002, and 003) and industrial area (Repeat sample)
WR0150 ^D	WR just DS Tyler Rd.	42.232825	-83.547244	4/29/2019	3.7 ^J ND	3.0 ^J 3.0 ^J	US Tyler Road, YCUA outfall, and landfills; DS of WR Airport outfall 001 and automotive industrial areas
WR0200	WR US Tyler Rd.	42.2341	-83.550229	4/29/2019	6.1 ^J	5.7 ^J	At sewer line crossing
WR0500	WR at dam on ACM property	42.240668	-83.559692	4/29/2019	4.1 ^J	ND	US of largely industrial area
WRW0100	WR West Trib at McGregor Ave	42.223803	-83.552191	4/29/2019	14	9.9	DS YCUA Emergency outfall; US Wayne Disposal and Old Ford Landfill
Outfalls to Willow Run							
WROF002	WR Airport SW Outfall 002	42.22799	-83.543633	4/29/2019	92	6.1 ^J	SW outfall for main drainage area at Willow Run Airport
WROF001	YCUA Outfall	42.23115	-83.54813	4/29/2019	5.4 ^J	5.8 ^J	72"outfall to Willow Run
Blanks							
TB0001	Trip blank			4/29/2019	ND	ND	water and bottle provided by TestAmerica
FB0001	Field blank			4/29/2019	ND	ND	Filled in field with TestAmerica water
CC0001	Chlorophyll equipment blank			4/29/2019	ND	ND	
TB0002	Trip blank			4/30/2019	ND	ND	water and bottle provided by TestAmerica
FB0002	Field blank			4/30/2019	ND	ND	Filled in field with TestAmerica water
CC0002	Chlorophyll equipment blank			4/30/2019	ND	ND	



Figure 1: Overview map of sampling sites on the Huron River, Norton Creek, Pettibone Creek, Horseshoe Creek, and Willow Run.

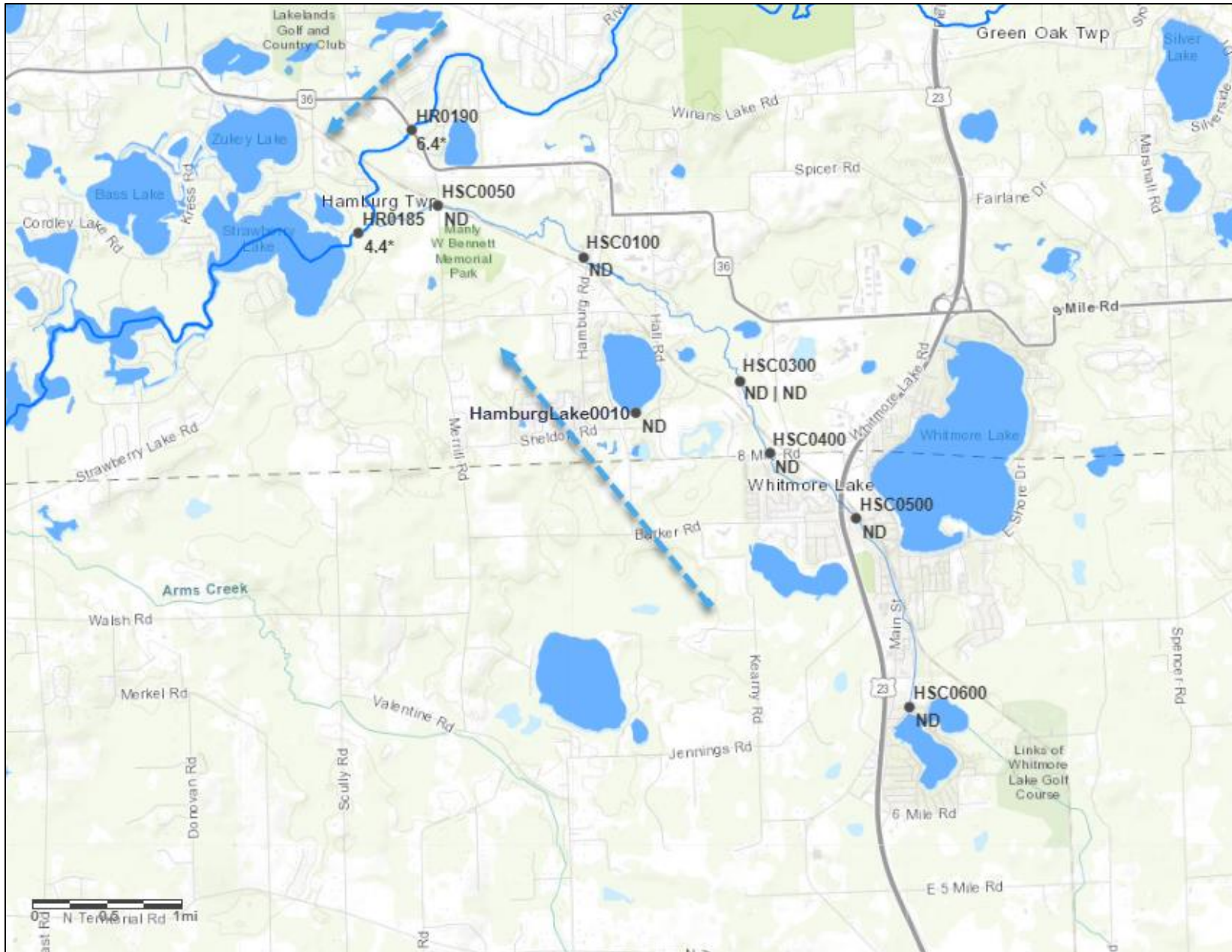


Figure 2: Sample results (PFOS ng/L) in Horseshoe Creek, Hamburg Lake and the Huron River. Concentrations that were less than the reporting limit but greater than or equal to the method detection limit are marked with an asterisks (*). Concentrations that were less than the detection limit (non-detect) are displayed as “ND”. Results from duplicates and replicates are shown for samples with two concentrations.

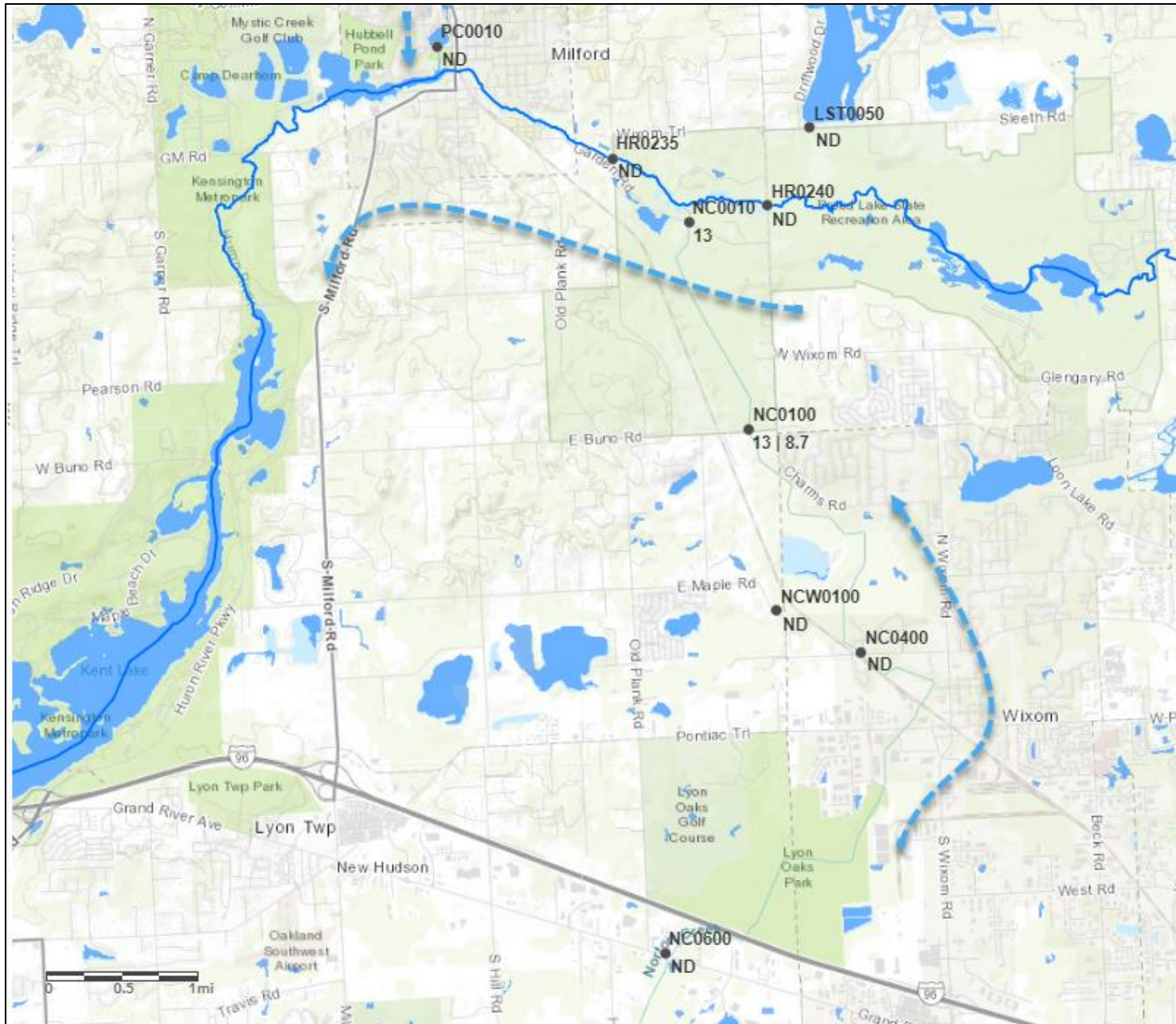


Figure 3: Sample results (PFOS ng/L) in Norton Creek, Pettibone Creek, Lake Sherwood Tributary, and the Huron River. Concentrations that were less than the detection limit (non-detect) are displayed as “ND”. Results from duplicates and replicates are shown for samples with two concentrations.

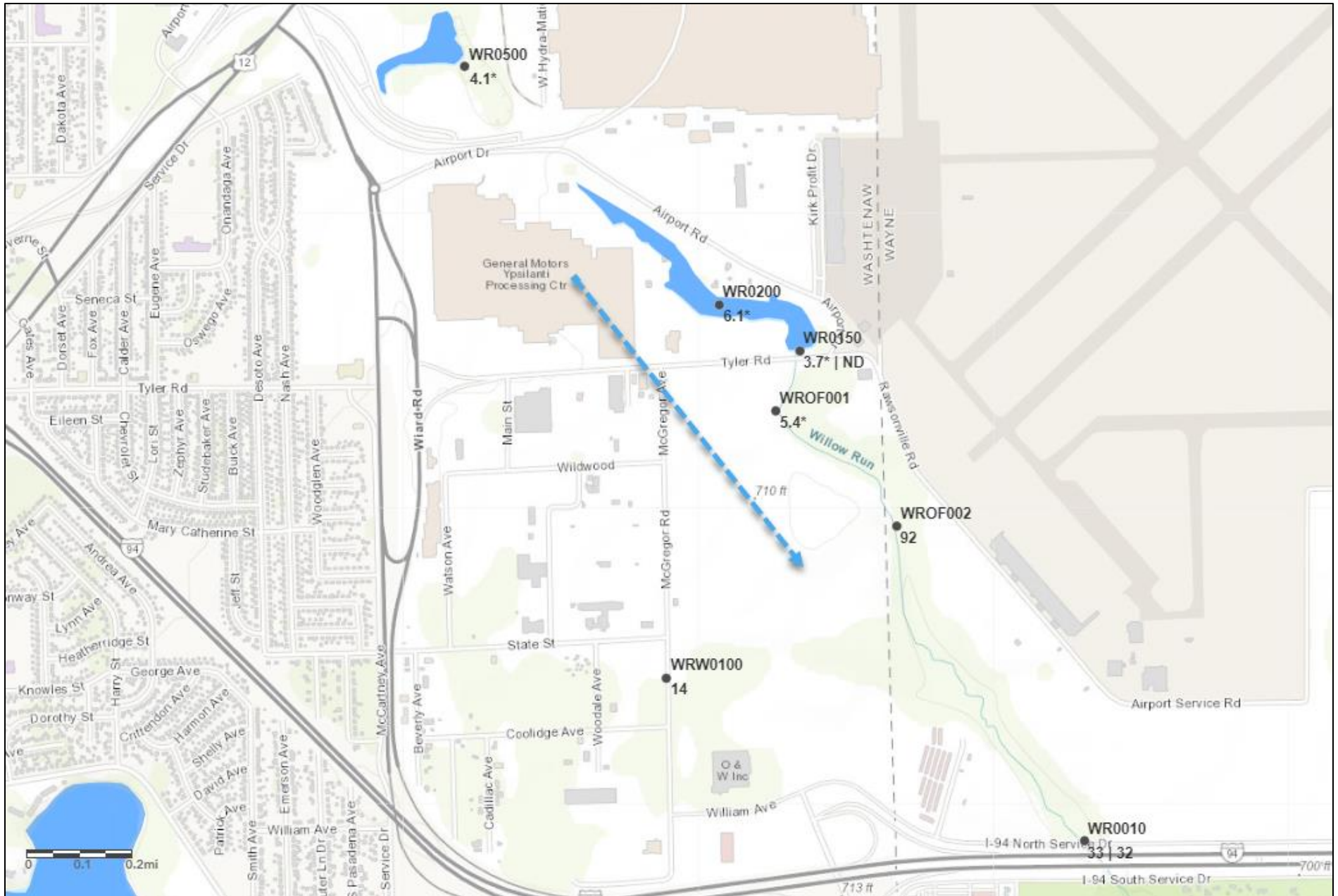


Figure 4: Sample results (PFOS ng/L) on Willow Run. Samples exceeded the HNV for PFOS at WROF002, WR0010, and WRW0100. Concentrations that were less than the reporting limit but greater than or equal to the method detection limit are marked with an asterisks (*). Concentrations that were less than the detection limit (non-detect) are displayed as “ND”. Results from duplicates and replicates are shown for samples with two concentrations.

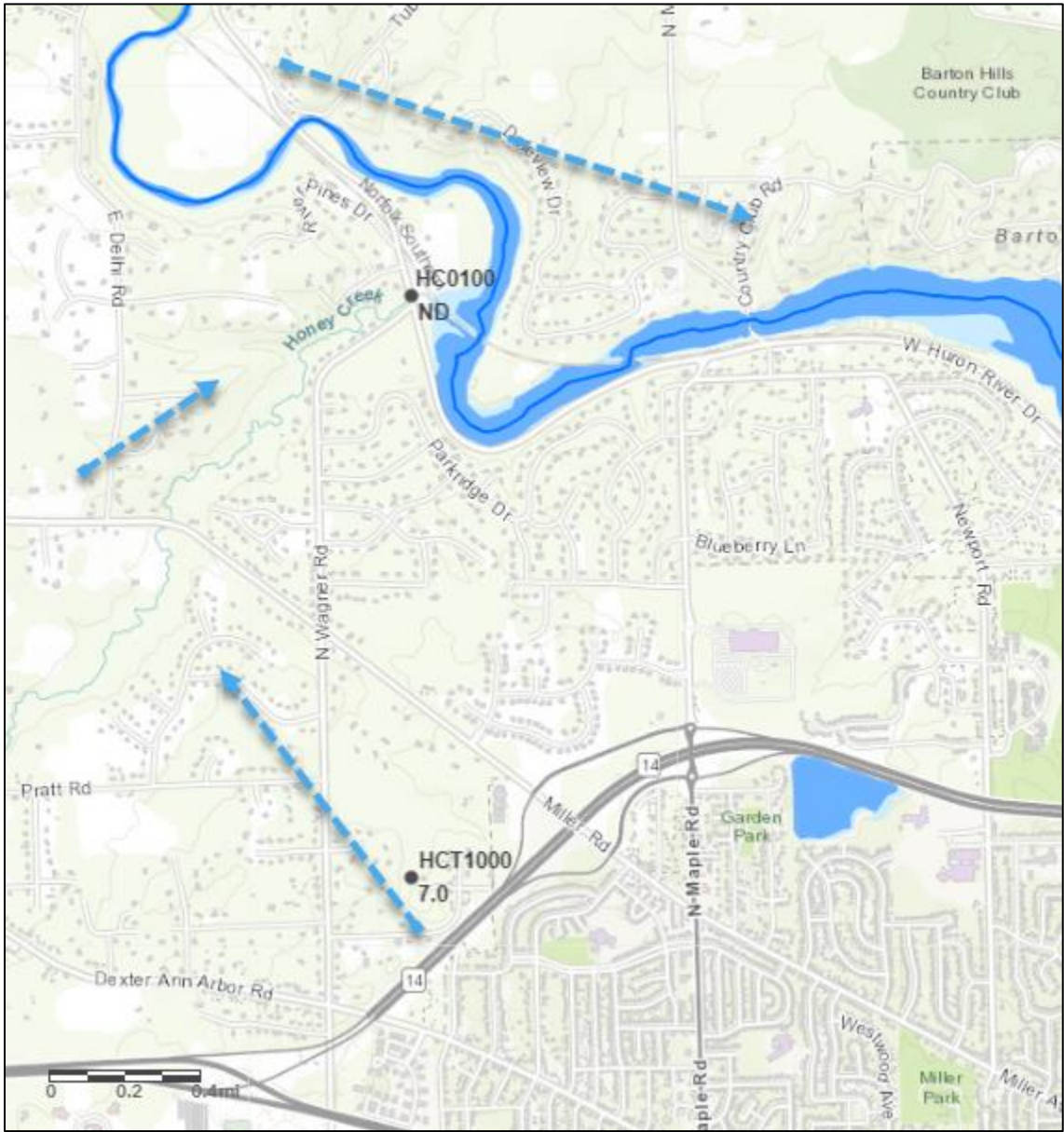


Figure 5: Sample results (PFOS ng/L) on Honey Creek (Washtenaw County). Concentrations that were less than the reporting limit but greater than or equal to the method detection limit are marked with an asterisks (*). Concentrations that were less than the detection limit (non-detect) are displayed as “ND”.