

Investigation of Per- and Polyfluoroalkyl Substances (PFAS) in Michigan's Rouge River watershed: Surface Sampling Update September 2021

Fish were collected in October 2019 from the Rouge River downstream of its confluence with the Lower Branch of the Rouge River. These samples were collected as part of routine monitoring for EGLE's [Fish Contaminant Monitoring Program](#) (FCMP). Yellow perch fillets had an average PFOS concentration of 7.8 ppb and ranged from 5 to 11 parts per billion (ppb). PFOS in rock bass fillets averaged 11.5 ppb and ranged from 7 to 20 ppb. Additional fish were collected from the Newburgh Lake impoundment of the Middle Branch of the Rouge River in October 2019. PFOS in largemouth bass fillets ranged from 24 to 129 ppb whereas concentrations ranged from non-detect (< 0.25 ppb) to 40.7 ppb in bluegill and pumpkinseed sunfish. Anglers planning to consume fish from these stretches of the Rouge River should follow the Michigan Department of Health and Human Services' guidance listed on the [Eat Safe Fish website](#). Additional fish were collected from the Rouge River watershed in 2021 for the FCMP: 1. Wilcox Lake of the Middle Branch; 2. Phoenix Lake of the Middle Branch; 3. the Lower Branch at Goudy Park; 4. The Main Branch at 9-mile near Southfield; and 5. The Main Branch in the turning basin near the mouth of the river. These results are pending and should be available during spring 2022.

EGLE Water Resources Division (WRD), Surface Water Assessment Section (SWAS) conducted surface water sampling in the Rouge River and Ecorse River near their confluence with the Detroit River in November 2019 following a detection of PFOS in the Wyandotte drinking water intake. A larger watershed-wide sampling was conducted in October 2020 to determine if PFAS contamination exists across the watershed. Additional sampling was conducted in August 2021 in Johnson Drain to determine if activities at the Arbor Hills Landfill near Northville resulted in PFAS contaminated surface water. Surface water samples were collected in accordance with the Michigan Per- and Polyfluoroalkyl Substances (PFAS) Sampling Guidance document (MDEQ 2018) and tested for 29 different PFAS following the Michigan Surface Water PFAS Investigation 2019 QAPP (EGLE 2019).

In November 2019, EGLE WRD collected four samples from the Rouge River near Zug Island. An additional sample was collected from the Detroit River downstream of the confluence with the Rouge River. All samples were below Rule 57 human health values for PFOS and PFOA. PFOS concentrations ranged from 1.3 to 2.9 parts per trillion (ppt) in the Rouge River, and the Detroit River sample had a PFOS concentration of 2.4 ppt (Figure 1). PFOS is compared to the human non-cancer value (HNV) for PFOS of 12 ppt for non-drinking water sources (Rouge River) and 11 ppt for drinking water sources (Detroit River). PFOA concentrations in the Rouge River ranged from 1.3 to 2.5 ppt and was 1.3 ppt in the Detroit River sample. PFAS results are compared to the HNV for PFOA of 12,000 ppt for non-drinking water sources and 420 ppt for drinking water sources.

In October 2020, EGLE WRD collected surface water samples from 57 locations in the Rouge River watershed for PFAS analysis. PFOA in these samples ranged from non-detect to 18.5 ppt and no sample exceeded the water quality standards for PFOA. As depicted in the Table 1 (bold and italicized text), three samples exceeded the standard for PFOS. The highest PFOS concentrations were observed in two drains downstream of the Willow Run Airport: Horner Drain at Van Born Rd (HD-0010; 429 ppt) and Sines Drain at Sheldon Rd (SD-0010; 84.8 ppt). The

other remaining sample with an exceedance for PFOS was the McClaughrey Drain near Michigan Avenue (MD-0010; 14.5 ppt).

In August 2021, EGLE WRD collected two samples from the Johnson Drain watershed following concerns of potential contamination from the Arbor Hills Landfill. EGLE WRD previously collected samples from this watershed in October 2020. At that time, all samples met the PFOS and PFOA water quality standards. In August 2021, a sample collected from an unnamed tributary to the Johnson Drain near the landfill at Napier Rd had a PFOS concentration of 16.5 ppt and a PFOA concentration of 17.2 ppt. The sample collected further downstream in the Johnson Drain at 6-mile had a non-detect PFOS concentration. PFOA was detected at 2.2 ppt.

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Table 1. Surface water PFOS and PFOA concentrations (in ppt) in surface water samples in Rouge River watershed of Michigan in October 2020. As these water bodies are non-drinking water sources, Results are compared to the Rule 57 Human Noncancer Value (HNV) of 12 ppt for PFOS and 12,000 ppt for PFOA. HNV exceedances are bolded and italicized.

Sample ID	Waterbody Name	Location Description	Collection Date	Latitude	Longitude	PFOS (ppt)	PFOS Flag	PFOA (ppt)	PFOA Flag
BB-0010	Bell Branch	Farmington Rd	10/20/2020	42.40434	-83.37375	2.8	J	3.5	J
BEL-0010	Bell Drain	Michigan Ave	10/19/2020	42.27827	-83.42390	5.0		17.9	
DD-5000	Davis Drain	West Park Dr.	10/20/2020	42.50303	-83.50590	5.1		3.7	J
FC-0010	Fellows Creek	Palmer Rd	10/19/2020	42.29421	-83.43602	2.8	J	3.9	J
FW-0010	Fowler Creek	Denton Rd	10/19/2020	42.28026	-83.52499	1.6	J, Q	1.1	J
GB-0010	Gunn Branch	d/s 5 mile @ daylight	10/20/2020	42.39700	-83.39036	2.1	J	3.4	J
HD-0010	Horner Drain	Van Born Road	10/19/2020	42.25805	-83.50343	429.0		16.8	
IC-0010	Ingersal Creek	Meadowbrook Rd	10/20/2020	42.45896	-83.45480	4.3		3.7	J
JD-0010	Johnson Drain	6 Mile Rd	10/20/2020	42.40811	-83.51682	2.1	J, Q	2.6	J
JD-0020	Johnson Drain	5 mile Rd	10/20/2020	42.39339	-83.53467	1.0	K	1.0	K
JD-0030	Johnson Drain	5 mile Rd	10/20/2020	42.38989	-83.58217	1.0	K	1.2	J
LBR-0010	Lower Branch Rouge River	Brady St	10/19/2020	42.31260	-83.24239	6.8		16.1	
LBR-0020	Lower Branch Rouge River	Military St	10/19/2020	42.30850	-83.25283	9.0		17.5	
LBR-0030	Lower Branch Rouge River	John Daly	10/19/2020	42.30063	-83.30062	8.0		15.0	
LBR-0040	Lower Branch Rouge River	Wayne Rd	10/19/2020	42.28499	-83.38344	6.8		15.2	
LBR-0045	Lower Branch Rouge River	John Hix Rd	10/19/2020	42.28160	-83.42190	6.7		14.0	
LBR-0050	Lower Branch Rouge River	Haggerty Rd	10/19/2020	42.27983	-83.44709	8.6		18.5	
LBR-0060	Lower Branch Rouge River	Canton Center Rd	10/19/2020	42.28856	-83.48646	6.3		17.4	
MBR-0010	Middle Branch Rouge River	Edward N Hines Dr	10/20/2020	42.33070	-83.24810	5.5		4.5	
MBR-0100	Middle Branch Rouge River	Circle Drive	10/20/2020	42.34341	-83.36039	4.3		4.5	
MBR-0110	Middle Branch Rouge River	Nankin Lake/Boat Launch	10/20/2020	42.35520	-83.37311	2.6	J	3.6	J
MBR-0120	Middle Branch Rouge River	Breakfast Dr	10/20/2020	42.37157	-83.44570	2.7	J	2.8	J
MD-0010	McClaghrey Drain	near Michigan Ave	10/19/2020	42.28102	-83.40174	14.5		9.0	
NLI-0010	Newburgh Lake Impoundment	Launch	10/20/2020	42.36594	-83.42247	1.9	J	3.3	J
PC-0010	Pebble Creek	11 Mi Rd	10/20/2020	42.48606	-83.30882	4.9		3.7	J
PC-0100	Pebble Creek	13 Mile Rd	10/19/2020	42.51439	-83.34246	3.9	J	4.2	
PLI-0010	Phoenix Lake Impoundment	near dam	10/20/2020	42.39311	-83.46745	1.8	J	2.1	J
RR-0020	Rouge River	Jefferson Ave	10/19/2020	42.28079	-83.12904	1.8	J	1.9	J
RR-0030	Rouge River	Dix St	10/19/2020	42.29648	-83.15114	1.7	J, Q	2.2	J
RR-0035	Rouge River	Schaefer Rd	10/19/2020	42.29066	-83.16741	3.5	J	4.8	
RR-0040	Rouge River	Greenfield Rd	10/19/2020	42.29459	-83.17940	5.6		7.5	
RR-0050	Main Branch Rouge River	Pull off north of Ford Road	10/19/2020	42.32871	-83.24118	3.4	J	3.4	J

RR-0060	Rouge River	Tireman Rd	10/19/2020	42.35239	-83.25217	3.5	J	3.2	J
RR-0070	Rouge River	Eliza Howell Park	10/19/2020	42.38786	-83.26710	4.1	J	4.9	
RR-0080	Rouge River	Fenkell St.	10/19/2020	42.40001	-83.27171	5.2		4.2	
RR-0090	Rouge River	7 mile	10/19/2020	42.42920	-83.26910	3.6	J	3.5	J
RR-0100	Rouge River	9 Mile Rd	10/20/2020	42.45696	-83.30584	3.6	J	3.2	J
RR-0110	Rouge River	Northwestern Hwy	10/19/2020	42.48903	-83.27648	1.8	J	2.5	J
RR-0120	Rouge River	Lincoln Street	10/19/2020	42.53851	-83.22786	2.8	J	3.8	J
RR-0130	Rouge River	W. South Blvd	10/19/2020	42.62210	-83.17978	3.3	J	2.8	J
SBD-0010	Sunken Bridge Drain	Quarton Lake Park	10/19/2020	42.54655	-83.22519	3.1	J	4.4	
SD-0010	Sines Drain	Sheldon Rd	10/19/2020	42.28173	-83.47621	84.8		5.4	
TB-0010	Tarabusi Creek	5 Mile Rd/Bell Creek Rd	10/20/2020	42.39918	-83.30930	6.4		3.8	J
TB-0100	Tarabusi Creek/Upper Branch	Farmington Rd	10/20/2020	42.43128	-83.37539	8.1		6.0	
TC-0010	Tonquish Creek	Life Church Canton	10/20/2020	42.33590	-83.44770	3.4	J	3.3	J
UBR-0010	Upper Branch Rouge River	Eliza Park	10/19/2020	42.39079	-83.27327	4.8		4.6	
UBR-0100	Upper Branch Rouge River	Freedom Rd	10/20/2020	42.45226	-83.35181	1.9	J	4.8	
UJD-0010	Unnamed trib to the Johnson Drain	Ridge Rd	10/20/2020	42.39734	-83.53020	1.0	K	1.3	J
UJD2-0010	Unnamed trib to the Johnson Drain	Currie Rd	10/20/2020	42.39644	-83.58762	5.1		16.2	
UND-0010	Unnamed trib to the Harrison Drain	Service Drive	10/19/2020	42.24860	-83.49340	4.2	J	6.6	
UNS-0010	Unnamed trib to Sunken Bridge Drain	Long Lake Rd	10/19/2020	42.58566	-83.23729	4.6		2.9	J
UWB-0010	Unnamed trib to Walled Lake Branch	W. Park Drive	10/20/2020	42.50899	-83.50588	1.9	J	1.7	J
WC-0010	Willow Creek	Newburgh Rd	10/20/2020	42.33692	-83.40938	4.8		4.1	J
WC-0020	Willow Creek	Hix Road	10/20/2020	42.32087	-83.41836	5.4		5.8	
WLB-0010	Walled Lake Branch	Pull off east of Ashbury Dr	10/20/2020	42.44272	-83.47272	2.5	J	4.2	
WLB-0100	Walled Lake Branch	12 Mile Rd	10/20/2020	42.49510	-83.49595	2.7	J, Q	5.1	
WLI-0010	Wilcox Lake Impoundment	Wilcox Lake Dr.	10/20/2020	42.38483	-83.46023	2.0	J	2.4	J

Sample ID Codes:

D = Duplicate

R = Replicate

PFAS Laboratory Codes

K: Result is below detection limit; therefore, the method detection limit is displayed

J: Result is above detection limit, below the reporting limit

Q: The ion transition ratio is outside of the acceptance criteria.

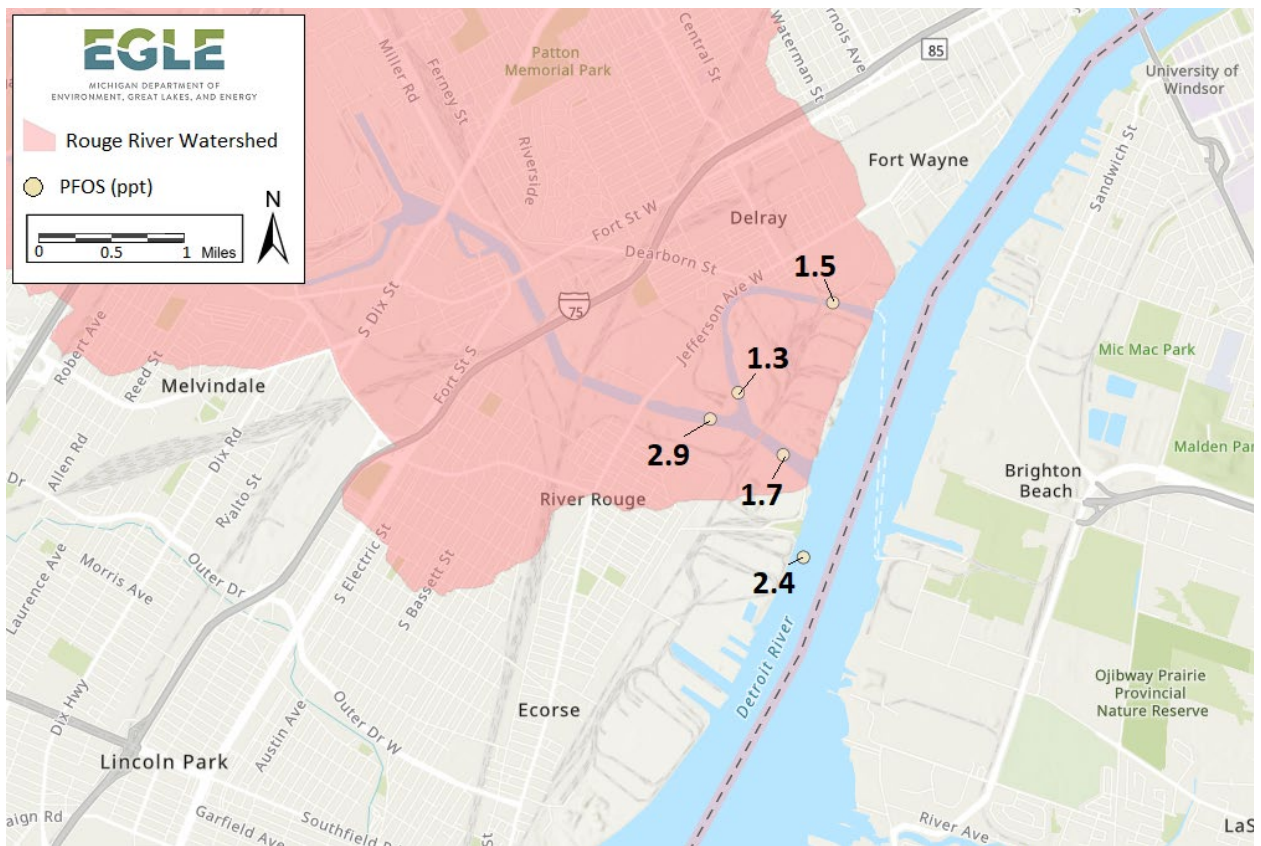


Figure 1. Surface water sampling locations in and near the Rouge River watershed in November 2019. PFOS concentrations are depicted in parts per trillion (ppt).

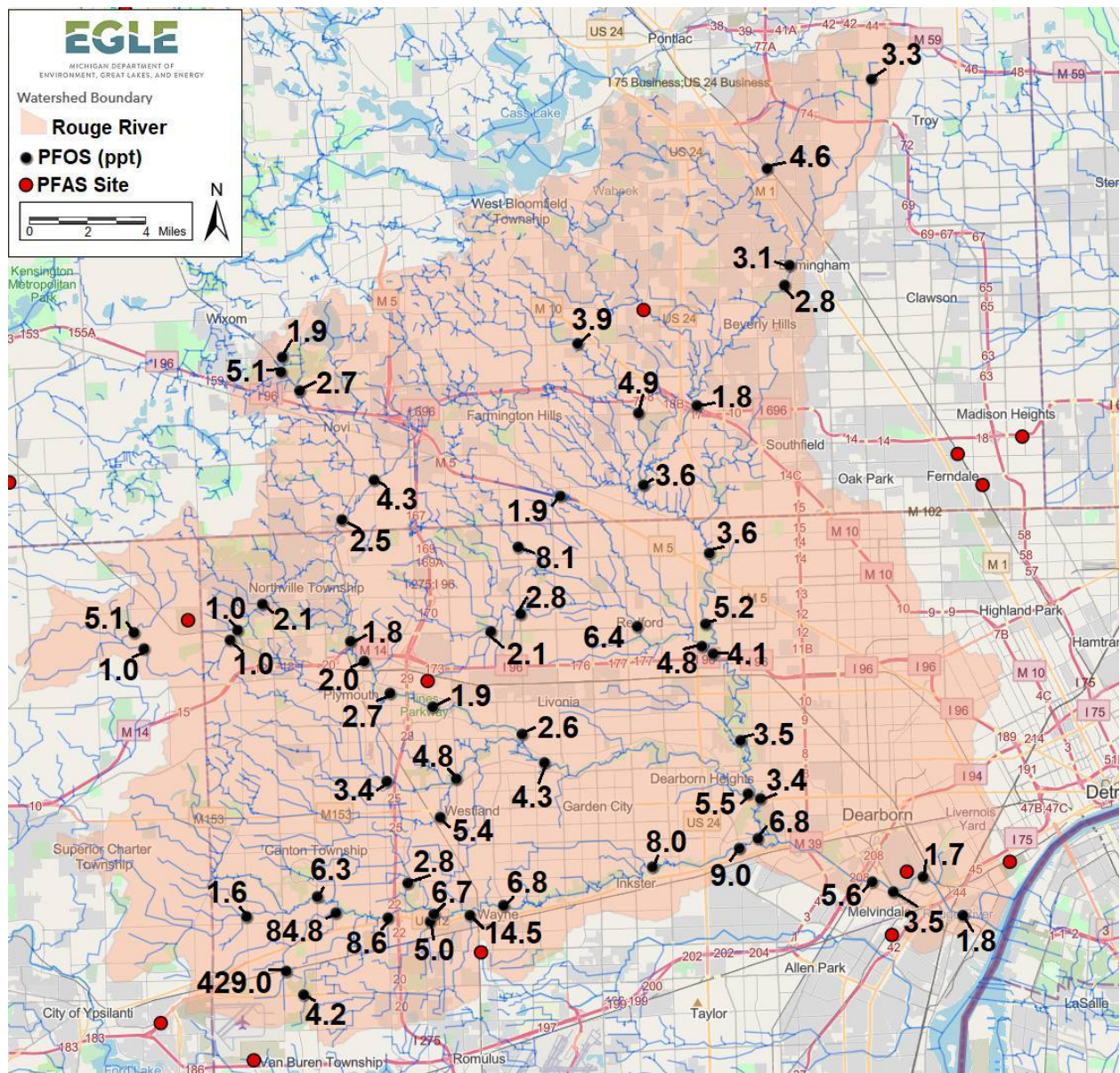


Figure 2. Surface water sampling locations in samples collected in the Rouge River watershed of Michigan in October 2020. PFOS concentrations are depicted in parts per trillion (ppt).

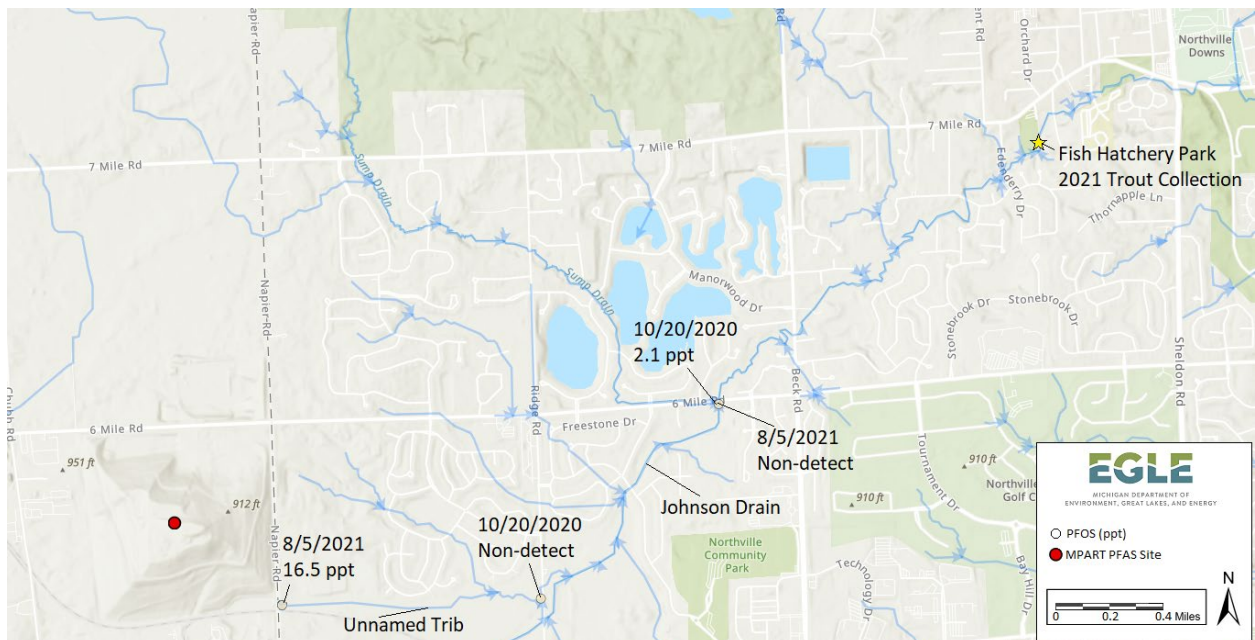


Figure 3. Surface water sampling locations in the Johnson Drain watershed collected in August 2021. PFOS concentrations are depicted in parts per trillion (ppt). The star indicates a fish sample collection location. Brown trout were collected from the drain at Fish Hatchery Park.