

**Investigation of Per- and Polyfluoroalkyl Substances (PFAS)
In William P. Thompson Pond – Port Huron Township
and
Kettlewell Pond and Two Unnamed Ponds – Fort Gratiot and Kimball Townships
Surface Water Sampling Update
May 2024**

Per- and polyfluorinated alkyl substances (PFAS) are a very large class of man-made organic chemicals that have been used in numerous industrial processes and consumer products for over 60 years. Validated analytical methods are available for relatively few of the thousands of compounds. Much of the environmental monitoring of PFAS in Michigan has focused on measuring perfluorinated chemicals.

Many PFAS are persistent, some bioaccumulate in the environment, and several are toxic to mammals and/or birds in laboratory tests. The toxicities of most PFAS have not been evaluated. Two perfluorinated compounds; perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS), have been the subject of the most toxicological work and environmental monitoring. Both compounds were manufactured intentionally, but they can also be generated as byproducts when other fluorinated compounds break down. Many products containing PFOS and PFOA were historically used in numerous industrial processes including metal plating, textile production and treatment, and specialty paper production. Other PFAS chemicals are still widely used today in industrial and consumer products. Industrial and domestic waste containing these compounds can enter the environment through municipal or private waste treatment systems, stormwater runoff, venting groundwater, or as atmospheric deposition via emissions. In addition, several PFAS are key ingredients in Aqueous Film-Forming Foam (AFFF). These foams have been used extensively in fire suppression training exercises at military bases nationwide as well as in emergency firefighting. In recent years PFAS have been detected in surface and groundwater near many military facilities. Both PFOS and PFOA have been measured in surface waters across the state, and PFOS has been detected in most fish tissue samples from Michigan waters that have been analyzed for PFAS.

The Michigan Department of Environment, Great Lakes, and Energy (EGLE) has generated Rule 57 surface water quality values for the protection of human health and aquatic life for PFOS, PFOA, perfluorobutane sulfonate (PFBS), perfluorohexanesulphonic acid (PFHxS), and perfluorononanoic acid (PFNA). The Rule 57 Water Quality Values (listed in nanograms per liter which is equivalent to parts per trillion) are as follows:

PFAS	Human Noncancer Value (HNV) (drinking) (ng/L)	HNV (nondrinking) (ng/L)	Final Chronic Value (FCV) (ng/L)	Aquatic Maximum Value (AMV) (ng/L)	Final Acute Value (FAV) (ng/L)
PFOS	11	12	140,000	780,000	1,600,000
PFOA	66	170	880,000	7,700,00	15,000,000
PFBS	8,300	670,000	24,000,000	120,000,00	240,000,00
PFHxS	59	210	-	-	-
PFNA	19	30	-	-	-

(-) Aquatic Life Values for PFHxS and PFNA are currently under development

The Aquatic Maximum Value (AMV) is the highest concentration of a substance to which an aquatic community can be exposed briefly without resulting in adverse effects, whereas the Final Chronic Value (FCV) is the highest concentration of a substance to which an aquatic community can be exposed for a long period of time without experiencing adverse effects. The Final Acute Value (FAV) is the value applied directly at the end of an effluent point source for EGLE discharge permitting purposes.

In 2023, elevated concentrations of PFOS were observed in fish tissue samples collected from William P. Thompson Pond as part of a Great Lakes Restoration Initiative grant EGLE received to assess contaminants in fish from water bodies with youth fishing events near Environmental Justice areas. Due to the elevated PFOS levels, the Michigan Department of Health and Human Services (MDHHS) notified the St. Clair County Health Department and Port Huron Township that PFOS concentrations were at levels to trigger a Do Not Eat fish advisory for all fish species in the pond. Appropriate signage was placed at the pond to inform the public.

The objective of this sampling event was to sample surface water bodies entering and exiting William P. Thompson Pond in Port Huron Township in order to investigate possible sources of PFAS to the William P. Thompson Pond. See Table 1 and Figure 1. It should be noted that this area falls within the [Eastern St. Clair County Area of Interest \(AOI\)](#). EGLE has been investigating elevated levels of PFAS in surface waters and soils throughout this area, some of which has been tracked to historical land applications and composting of industrially impacted biosolids and sludge residuals from PFAS use associated with paper industry.

Additional surface water samples were collected from the Kettlewell Pond and two other unnamed ponds for their proximity to known PFAS areas in Fort Gratiot and Kimball Townships to inform future work by the EGLE in the Eastern St. Clair County AOI and the Fish Contaminant Monitoring Program. See Table 2 and Figure 2.

Samples were collected in accordance with the EGLE Surface Water PFAS Sampling Guidance document (EGLE 2022). Each sample was collected in two polypropylene (PP) vials (certified PFAS-free). All personnel handling sample bottles used nitrile gloved hands. One duplicate sample was collected. One site was randomly selected for the duplicate sample.

All samples were delivered to the EGLE Environmental Laboratory within the required holding period for surface water PFAS samples. Samples were analyzed for selected PFAS, as described in the Quality Assurance Project Plan (QAPP) (EGLE 2022) and listed in Table 3.

All 10 locations in the vicinity of the William P. Thompson Pond investigation area exceeded the PFOS Rule 57 nondrinking HNV. Additional source tracking investigations are being planned. Given the low surface water PFOS concentrations in the three ponds outside of the investigation area; EGLE's Fish Contaminant Monitoring Program will attempt fish collections in future years to determine if these locations are suitable fishing location alternatives due to the Do Not Eat advisory at William P. Thompson Pond.

References:

Michigan Department of Environmental, Great Lakes, and Energy. (2022). Surface Water PFAS Sampling Guidance.

Michigan Department of Environment, Great Lakes, and Energy. (2022). Michigan Surface Water Perfluoroalkyl and Polyfluoroalkyl Compound (PFAS) Investigation: Quality Assurance Project Plan (QAPP).

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Table 1. PFOS, PFOA, PFBS, PFHxS, and PFNA concentrations in surface water samples collected at and near William P. Thompson Pond in Port Huron Township in May 2024. Concentrations exceeding the Rule 57 HNV (nondrinking) are in bold and italicized.

Sample ID	Sample Location Description	Latitude	Longitude	PFOS (ng/L)	PFOA (ng/L)	PFBS (ng/L)	PFHxS (ng/L)	PFNA (ng/L)
51-UTBK1-0040	Unnamed drainage ditch at Partridge Road	42.975351	-82.492896	330	57	4.6	3.3	3.9
51-UTBK1-0020	Unnamed drainage ditch at Michigan Road	42.972422	-82.482557	86	110	6.3	3.8	9.9
51-UTBK1-0010	Unnamed drainage ditch at Business I-69	42.973839	-82.473031	120	90	5.1	3.9	9.7
51-UTBK2-0010	Not able to access; did not sample	42.972222	-82.465927	-	-	-	-	-
51-UTBK3-0010	Unnamed drainage ditch at West of 32 nd Street	42.973864	-82.463808	21	25	4.8	8.3	<2
51-BK-WPT-0010	William P. Thompson Pond fishing pier	42.976194	-82.472375	46	99	4.1	2.9	8.3
51-UTBK4-0010	Unnamed drainage ditch at 40 th Street	42.976194	-82.472938	37	95	4.6	3.3	7.7
51-STC-0040	Stocks Creek west side of 40th Street	42.981444	-82.473222	15	59	7.2	4.3	3.1
51-STC-0030	Stocks Creek at Lewis Drive	42.983274	-82.469011	20	66	7.5	4.1	4.3
51-HFD-0040	Huffman Drain at South side of Griswold Road	42.965678	-82.491516	66	120	2.3	<2	11
51-BK-WPT-0010-DUP	William P. Thompson Pond fishing pier (Duplicate Sample)	42.976194	-82.472375	46	100	4.0	3.1	9.5
Field Blank-1	William P. Thompson Pond fishing pier	42.976194	-82.472375	<2	<2	<2	<2	<2
Trip Blank	Provided by EGLE Laboratory			<2	<2	<2	<2	<2

Table 2. PFOS, PFOA, PFBS, PFHxS, and PFNA concentrations in surface water samples collected in St. Clair County in May 2024. None of the results exceed the Rule 57 HNV (nondrinking).

Sample ID	Sample Location Description	Latitude	Longitude	PFOS (ng/L)	PFOA (ng/L)	PFBS (ng/L)	PFHxS (ng/L)	PFNA (ng/L)
06-KWP-0010	Kettlewell Pond at McIntyre Park	43.0477758	-82.4676429	2.8	7.6	<2	<2	<2
51-SRP-001	Unnamed Pond at Lake Drive	43.0220974	-82.4679986	<2	9.8	5.7	<2	<2
51-KTPP-0010	Unnamed Pond at Kimball Park	43.9741403	-82.5293327	<2	6.5	2.0	<2	<2

Table 3. Per- and polyfluoroalkyl substances (PFAS) analyzed in surface water

Compound	Abbreviation	CAS #
Perfluorotetradecanoic acid	PFTeA	376-06-7
Perfluorotridecanoic acid	PFTriA	72629-94-8
Perfluorododecanoic acid	PFDoA	307-55-1
Perfluoroundecanoic acid	PFUnA	2058-94-8
Perfluorodecanoic acid	PFDA	335-76-2
Perfluorononanoic acid	PFNA	375-95-1
Perfluorooctanoic acid	PFOA	335-67-1
Perfluoroheptanoic acid	PFHpA	375-85-9
Perfluorohexanoic acid	PFHxA	307-24-4
Perfluoropentanoic acid	PFPeA	2706-90-3
Perfluorobutanoic acid	PFBA	375-22-4
Perfluorodecanesulfonic acid	PFDS	335-77-3
Perfluorononanesulfonic acid	PFNS	68259-12-1
Perfluorooctanesulfonic acid	PFOS	1763-23-1
Perfluoroheptanesulfonic acid	PFHpS	375-92-8
Perfluorohexanesulfonic acid	PFHxS	355-46-4
Perfluoropentanesulfonic acid	PFPeS	2706-91-4
Perfluorobutanesulfonic acid	PFBS	375-73-5
Perfluorooctanesulfonamide	PFOSA	754-91-6
Fluorotelomer sulphonic acid 8:2	FTS 8:2	39108-34-4
Fluorotelomer sulphonic acid 6:2	FTS 6:2	27619-97-2
Fluorotelomer sulphonic acid 4:2	FTS 4:2	757124-72-4
2-N-Ethylperfluorooctanesulfonamidoacetic acid	N-EtFOSAA	2991-50-6
2-N-Methylperfluorooctanesulfonamidoacetic acid	N-MeFOSAA	2355-31-9
Hexafluoropropylene oxide dimer acid	HFPO-DA	13252-13-6
11-chloroeicosafluoro-3 oxaundecane-1-sulfonic acid	11Cl-PF3OUdS	763051-92-9
9-chlorohexadecafluoro-3-oxanone1-sulfonic acid	9Cl-PF3ONS	756426-58-1
4,8-dioxa-3H-perfluorononanoic acid	ADONA	919005-14-4
Perfluoroethylcyclohexane sulfonate	PFECHS	67584-42-3
Perfluorobutylsulfonamide	PFBSA	30334-69-1
Perfluorohexanesulfonamide	PFHxSA	41997-13-1

William P. Thompson Pond Investigation

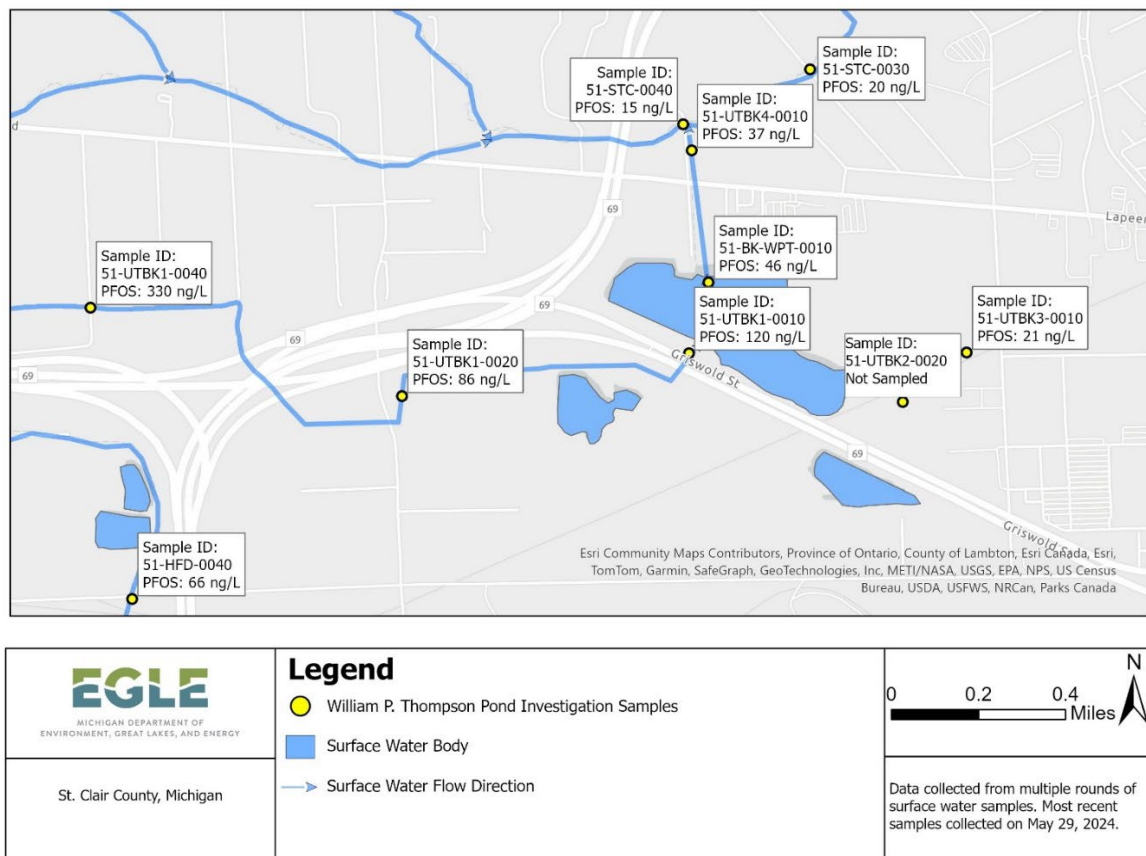


Figure 1. Overview map of surface water PFOS concentrations (ng/L) at locations collected at and near William P. Thompson Pond in Port Huron Township, Michigan in May 2024

Kettlewell Pond and Two Unnamed Ponds Investigation

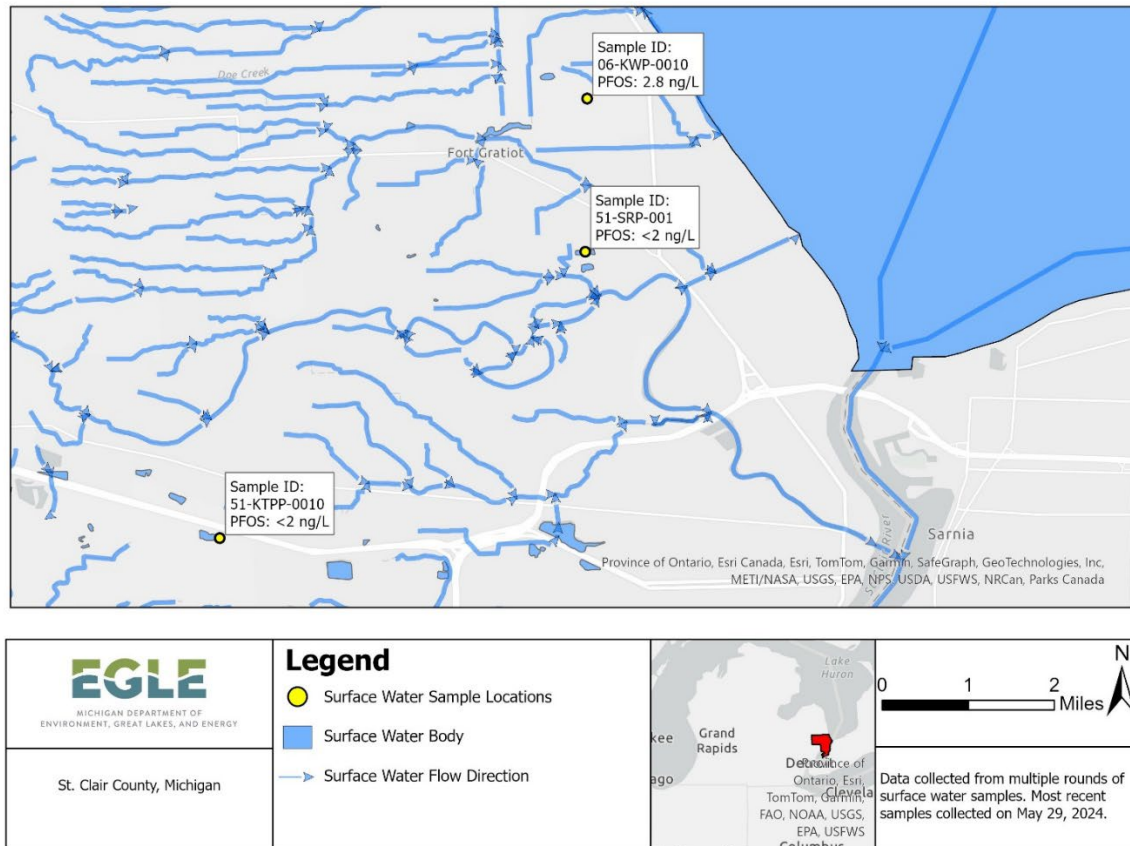


Figure 2. Overview map of surface water PFOS concentrations (ng/L) at locations collected in St. Clair County, Michigan in May 2024