

## PFAS data for the Houghton Lake fish samples from the 2022 collection

We are analyzing for 39 different PFAS compounds in fish tissue. In addition, we are looking at two different isomers (linear and branched) of PFOS, PFOA, and PFHxS. As you may have heard, there was an issue with the PFOS analysis from fish tested by the MDHHS laboratory in 2021 and 2022, which included the Houghton Lake fish. The press release, which focuses on smelt, can be read [here](#). A naturally produced chemical by the fish, a bile acid, was interfering with the analysis and was being quantified as PFOS. I asked the lab to rerun the Houghton Lake bluegill and yellow perch samples with their new method that can distinguish between PFOS and the bile acid. The reanalysis of these fish found lower PFOS concentrations, see the figure below. The summary table includes the updated PFOS concentrations.

PFAS	Abbreviation	Bluegill				Yellow Perch				Largemouth/Smallmouth Bass				Walleye			
		# Samples	# Detects	Avg Detected Conc (ppb)	Max Conc (ppb)	# Samples	# Detects	Avg Detected Conc (ppb)	Max Conc (ppb)	# Samples	# Detects	Avg Detected Conc (ppb)	Max Conc (ppb)	# Samples	# Detects	Avg Detected Conc (ppb)	Max Conc (ppb)
Perfluorononanesulfonic acid (ppb)	PFNS	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
11-chloroicosafafluoro-3-oxanonane-1-sulfonate	11ClPF3OUdS	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
2-(N-Ethylperfluorooctanesulfonamido) acetic acid	EiFOSAA	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
2-N-Methylperfluorooctanesulfonamidoacetic acid	MeFOSAA	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
3:3 Fluorotelomer carboxylic acid (ppb)	3:3 FTCA	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
4:2 Fluorotelomer sulphonic acid (ppb)	4:2 FTS	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
5:3 Fluorotelomer carboxylic acid (ppb)	5:3 FTCA	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
6:2 Fluorotelomer sulphonic acid (ppb)	6:2 FTS	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
7:3 Fluorotelomer carboxylic acid (ppb)	7:3 FTCA	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
8:2 Fluorotelomer sulphonic acid (ppb)	8:2 FTS	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
9-chlorohexadecafluoro-3-oxanonane-1-sulfonate	9Cl-PF3ONS	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
ammonium 4,8-dioxa-3H-perfluorononanoate (ppb)	ADONA	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
Hexafluoropropylene oxide dimer acid (ppb)	HFPO-DA	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
Branched Perfluorooctane sulfonate (ppb)	PFOS-Br	10	1	-	0.26	6	0	-	-	6	6	1.26	2.65	10	10	3.29	8.04
Linear- Perfluorooctanesulfonic acid (ppb)	L-PFOS	10	10	1.59	2.26	6	4	0.47	0.92	6	6	4.60	5.49	10	10	2.24	2.72
Perfluorooctane sulfonate (ppb)	PFOS	10	10	1.77	2.47	6	5	0.54	1.13	6	6	5.85	8.14	10	10	5.53	10.54
Branched Perfluorooctanoic acid (ppb)	B-PFOA	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-

Linear Perfluorooctanoic acid (ppb)	L-PFOA	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
Perfluorooctanoic acid (ppb)	PFOA	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
Branched-Perfluorohexanesulfonic acid (ppb)	B-PFHxS	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
Linear-Perfluorohexanesulfonic acid (ppb)	L-PFHxS	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
Perfluorohexane sulfonate (ppb)	PFHxS	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
Nonafluoro-3,6-dioxahexanoic acid (ppb)	NFDHA	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
Perfluorobutylsulfonamide (ppb)	PFBSA	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
Perfluoro (2-ethoxyethane) sulfonic acid (ppb)	PFEESA	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
Perfluoro-3-methoxypropionic acid (ppb)	PFMPA	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
Perfluoro-4-methoxybutanoic acid (ppb)	PFMBA	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
Perfluorobutane sulfonate (ppb)	PFBS	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
Perfluorobutanoic acid (ppb)	PFBA	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
Perfluorodecane sulfonate (ppb)	PFDS	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
Perfluorodecanoic acid (ppb)	PFDA	10	0	-	-	6	0	-	-	6	5	2.55	3.27	10	3	1.35	1.46
Perfluorododecanoic acid (ppb)	PFDoA	10	2	0.66	0.86	6	1	-	0.45	6	6	0.73	0.97	10	5	0.41	0.47
Perfluoroethylcyclohexanesulfonate (ppb)	PFECHS	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
Perfluoroheptanesulfonic acid (ppb)	PFHpS	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
Perfluoroheptanoic acid (ppb)	PFHpA	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
Perfluorohexanesulfonamide (ppb)	PFHxSA	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
Perfluorohexanoic acid (ppb)	PFHxA	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
Perfluorononanoic acid (ppb)	PFNA	10	0	-	-	6	0	-	-	6	1	-	0.46	10	1	-	0.30

Perfluorooctane sulfonamide (ppb)	PFOSA	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
Perfluoropentanesulfonic acid (ppb)	PFPeS	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
Perfluoropentanoic acid (ppb)	PFPeA	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
Perfluoropropanesulfonic acid (ppb)	PFPPrS	10	0	-	-	6	0	-	-	6	0	-	-	10	0	-	-
Perfluorotetradecanoic acid (ppb)	PFTeA	10	1	0.27	0.27	6	0	-	-	6	1	-	0.28	10	0	-	-
Perfluorotridecanoic acid (ppb)	PFTriA	10	4	0.49	0.79	6	1	-	0.28	6	6	0.60	1.04	10	8	0.34	0.42
Perfluoroundecanoic acid (ppb)	PFUnA	10	9	1.16	2.88	6	2	0.72	0.92	6	6	2.89	4.16	10	10	1.39	1.70