

Over the past eight years, Michigan has taken a targeted and source-based approach to evaluate and reduce per- and polyfluoroalkyl substances (PFAS) in municipal wastewater. This approach includes the implementation of the [Industrial Pretreatment Program \(IPP\) PFAS Initiative](#), the incorporation of PFAS requirements in [National Pollutant Discharge Elimination System \(NPDES\) permits](#), and the implementation of the [Land Application of Biosolids Containing PFAS Interim Strategy \(Interim Strategy\)](#). Through these strategies, Michigan's Wastewater Treatment Plant (WWTP) professionals have led efforts to understand concentrations and sources of PFAS in municipal wastewater and developed appropriate control and reduction strategies to address these sources.

These efforts are clearly making a positive impact and have resulted in reduced perfluorooctanesulfonic acid (PFOS) concentrations in wastewater effluent and land-applied biosolids as shown in Figure 1 and Table 1, respectively. The most significant reductions have been achieved when industrial discharges with elevated PFOS concentrations were targeted by IPP Control Authorities for source control actions. To date, source control has been implemented at over 86 industrial facilities that discharge to municipals systems in Michigan, with most facilities installing treatment systems to reduce PFAS concentrations prior to discharge. Key to this effort is the existence in Michigan of enforceable water quality values (WQV) for PFOS, perfluorooctanoic acid (PFOA), perfluorobutanesulfonic acid (PFBS), perfluorohexanesulfonic acid (PFHxS), and perfluorononanoic acid (PFNA), with PFOS as the predominant regulatory driver.

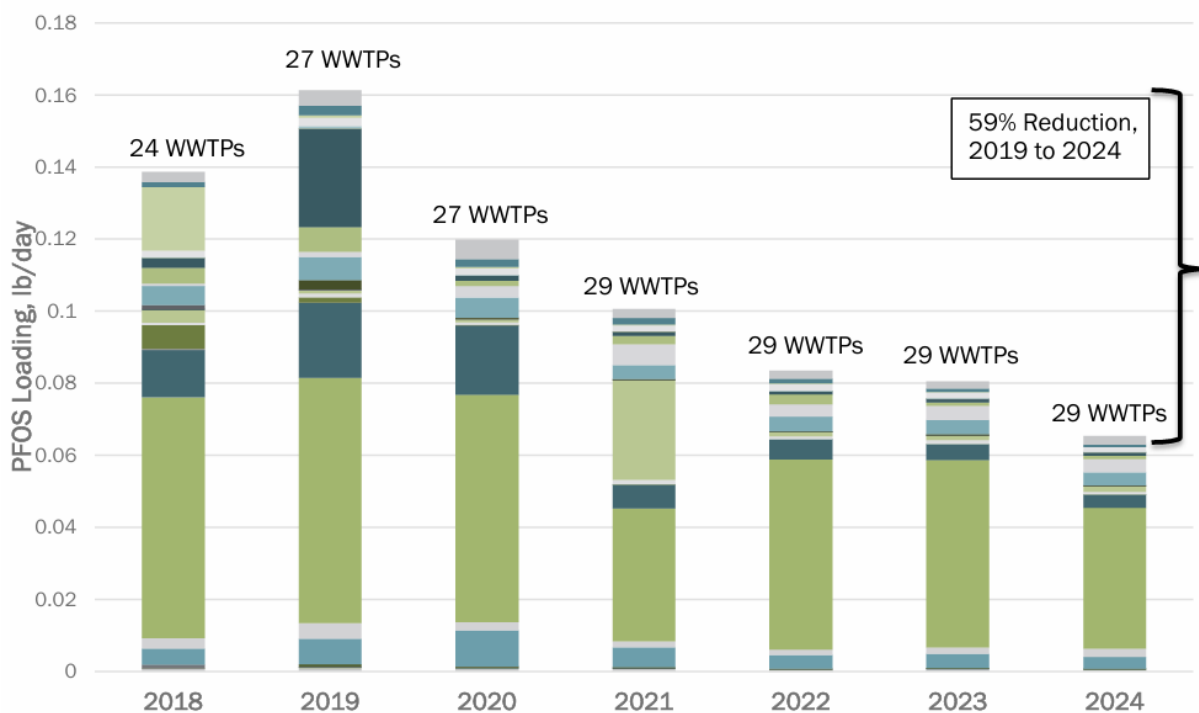


Figure 1: PFOS Loading Reduction at IPP WWTPs Discharging to Surface Waters From 2018 to 2024

Table 1: PFOS and PFOA Mean and Median values since 2018 in Biosolids

Year	PFOS Mean	PFOS Median	PFOA Mean	PFOA Median
2018*	184	13	25	7
2021	21	9	8	4
2022	16	10	7	3
2023	12	7	6	3
2024	8	5	5	2
2025	8	6	4	2
2026**	8	6	4	2

* = Includes data from industrially impacted sources as part of a statewide study

** = 2026 values updated 7/23/2026

All values listed are in parts per billion ppb

Expanding upon the information collected during the IPP PFAS Initiative, the Michigan Department of Environment, Great Lakes and Energy's (EGLE) Water Resources Division (WRD) launched an additional study for the [Evaluation of PFAS in Influent, Effluent, and Residuals of Wastewater Treatment Plants \(WWTPs\) in Michigan](#) to evaluate the presence of PFAS in municipal wastewater and associated residuals. Land application sites were also evaluated in a [Statewide Wastewater Treatment Plant and Biosolids PFAS Study](#) to further understand the potential impact land-applied biosolids have on the environment. The Interim Strategy was developed using information collected during these studies, including the distribution of PFOS concentrations, knowledge of the WWTP collection systems, and studies of land application sites. Figure 2 shows the distribution of PFOS as part of the study mentioned above.

PFOS Concentrations in Biosolids/Sludge in 2018 Study

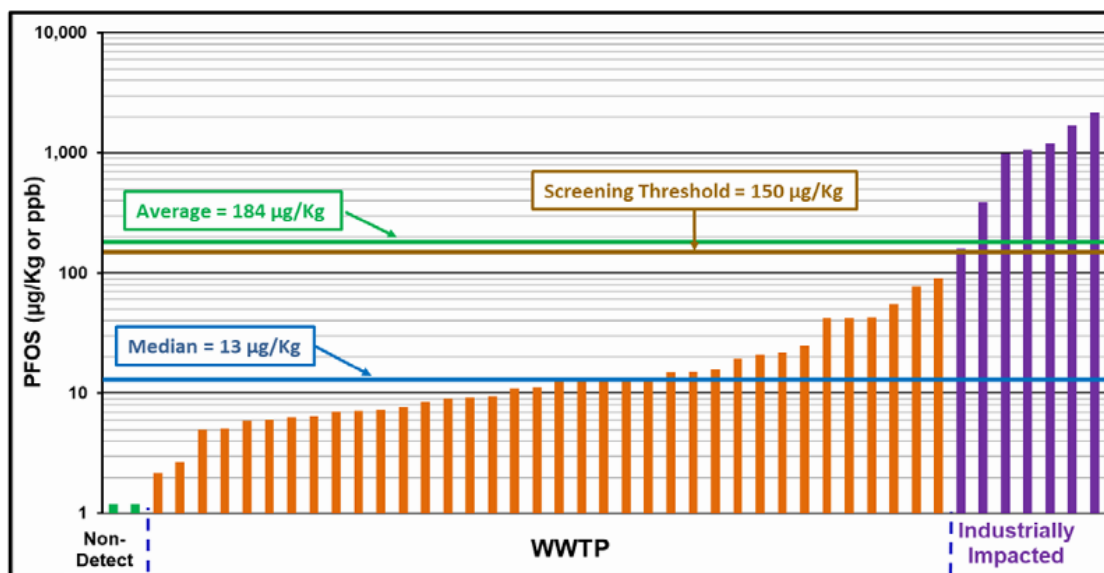


Figure 2: Evaluation of 42 municipal WWTPs in Michigan in 2018. PFOS concentrations are reported as parts per billion (microgram per kilogram) on a log scale.

The Interim Strategy first went into effect for land application of biosolids occurring in Michigan on or after [July 1, 2021](#). Under the Interim Strategy, WWTPs are required to sample for PFAS prior to land application and submit the results to the WRD and landowner and/or farmer. How biosolids are handled,

and other requirements for the facility, were based upon PFOS concentrations. The Interim Strategy was based on a threshold approach, as PFOS concentration increased, certain required or recommended actions were triggered for the WWTP.

EGLE has since released two updates to the Interim Strategy, [first in 2022](#), and [most recently in 2024](#). These updates expanded upon sampling requirements, lowered thresholds for mitigation and land application prohibition, and added PFOA as a limiting analyte as shown in Table 2. The 2024 Interim Strategy also updated monitoring frequency to require once per calendar year at a minimum.

Table 2: 2024 Land Application of Biosolids Containing PFAS Interim Strategy Thresholds

PFOS and/or PFOA Concentration	Land Application	Source Identification	Effluent Sampling
At or above 100 ppb	Prohibited	Required	Required
Between 20 ppb and 100 ppb	Reduced Rate (1.5 dry tons per acre maximum)	Required	Required
Below 20 ppb	As normal	No	No
PFOS + PFOA below 20 ppb	Class A EQ *	No	No

** = If already class A EQ designated through Michigan's Part 24 rules or attempting to achieve Class A EQ Status. This combined concentration must be demonstrated quarterly.*

As the Interim Strategy moves forward, EGLE will continue to mitigate risks associated with land application containing PFAS. This involves prohibiting industrially impacted biosolids from being land applied and continuing to drive down PFAS concentrations present in impacted biosolids.

Since the release of the Interim Strategy, EGLE has held stakeholder meetings and public webinars to ensure PFAS sampling of biosolids guidance is received by all WWTPs. The WRD also collaborates with the Michigan PFAS Action Response Team (MPART), Michigan Department of Agriculture and Rural Development, Michigan Department of Health and Human Services, and members of the Michigan Water Environment Association's Biosolids Committee regarding ongoing implementation and updates to the Interim Strategy.

Identification and removal of significant industrial sources is a critical first step and has eliminated the highest concentrations of PFOS in effluent and biosolids in Michigan, where impacts to receiving streams and fields from historical discharges and land applications have been documented. However, targeting active industrial discharges alone may not be enough for some facilities, and investigations into other potential sources will be necessary to achieve compliance with regulatory requirements and further reduce concentrations in biosolids/sludge. Additionally, the potential for historical contamination within the collection system and treatment plant processes and the transformation and cycling of PFAS throughout the system need to be better understood as we move forward.

Some areas requiring further investigation include:

- Infiltration into the collection system from former industrial sites with contaminated groundwater.
- Firefighting foam training areas and deployment sites.

- Commercial operations where PFAS-containing products may have been used (i.e., laundries, car washes, carpet cleaners, detailers, etc.).
- Residential and commercial septage disposal.
- Multi-use facilities like schools, medical complexes, resorts, and retail box stores where maintenance activities such as floor cleaning/stripping/waxing, carpet washing, and laundry services may be occurring.

Moving forward, EGLE will continue to support the United States Environmental Protection Agency's efforts to complete a risk-based assessment of PFAS in biosolids as detailed in the [Strategic Roadmap](#), work with MPART agencies to coordinate beneficial reuse of biosolids, and investigate potential sites where industrially impacted residuals may have been land applied prior to 2018. EGLE will continue to utilize existing regulatory mechanisms to focus on reducing PFAS concentrations through disciplined approaches and conservative strategies to protect public health and the environment from potential adverse effects.