



GRETCHEN WHITMER  
GOVERNOR

STATE OF MICHIGAN  
DEPARTMENT OF  
ENVIRONMENT, GREAT LAKES, AND ENERGY  
LANSING



LIESL EICHLER CLARK  
DIRECTOR

September 10, 2020

IPP Community Representative  
IPP Community Address  
IPP Community City, State, Zip

Dear IPP Community Representative:

**SUBJECT:** Update on the Industrial Pretreatment Program Per- and Polyfluoroalkyl Substances Initiative and Continued Efforts

This letter is written to provide participants in the Industrial Pretreatment Program (IPP) Per- and Polyfluoroalkyl Substances (PFAS) Initiative with an update on efforts to manage PFAS by the Michigan Department of Environment, Great Lakes, and Energy (EGLE), Water Resources Division (WRD). As work on these emerging pollutants progresses, EGLE's approach is evolving and we wanted to update you on developments that affect IPP PFAS Initiative participants.

### **IPP Responsibilities and Perfluorooctane Sulfonate Reduction**

Since the IPP PFAS Initiative began in February 2018, publicly owned treatment works (POTW) have identified sources of PFAS, specifically perfluorooctane sulfonate (PFOS), to their collection systems. Many POTWs achieved substantial PFOS reductions by working with their most significant sources. In several cases, when the most significant source(s) installed pretreatment for PFOS, the reduction was substantial and the municipal wastewater treatment plant (WWTP) achieved compliance with Rule 57 (R 323.1057) of the Part 4 Rules, Water Quality Standards (WQS), promulgated pursuant to Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA), for PFOS of 12 nanograms per liter (ng/L) (11 ng/L for receiving streams that are drinking water sources).

However, some POTWs have identified PFOS sources but the WWTP effluent remains above WQS. In some cases, sources have installed pretreatment systems that have significantly reduced PFOS but other factors not related to the source's current discharge have caused the WWTP effluent to remain above WQS. These factors include residual PFOS in the WWTP due to handling of impacted biosolids, inflow of groundwater contaminated by PFOS through leaks in sanitary sewers, discharge of PFOS contaminated storm water into sanitary sewers, and in some cases, unidentified PFOS sources. The WRD continues to work with POTWs in this complex circumstance to achieve compliance with WQS.

### Compliance Schedules

In other cases, sources have requested additional time to identify the PFOS in their processes, design and install pretreatment systems, and/or implement other reduction measures. Please be reminded that when the effluent from the WWTP remains above the WQS due to discharges

from confirmed PFOS sources, the WWTP is passing through PFOS. Sources causing pass-through are in violation of Rule 3 (R 323.2303) of the Part 23 Rules, Pretreatment, promulgated pursuant to Part 31 of the NREPA. This rule prohibits sources from discharging pollutants causing pass-through and requires the POTW to take appropriate enforcement action when pass-through occurs. Sources causing pass-through should be under compliance schedules consistent with the POTW's approved Enforcement Response Plan (ERP).

### Source Monitoring

The WRD anticipated that PFOS reduction would be difficult for some sources and encouraged POTWs to work cooperatively with sources to develop reasonable, mutually acceptable compliance schedules and to incorporate these into enforceable documents consistent with IPP rules. This has happened in many instances; however, the WRD has found that in some cases the POTW has not performed and/or required ongoing PFOS sampling of the source causing pass-through. Ongoing source sampling is necessary to measure progress. The WRD recommends a source sampling frequency of no less than quarterly if the WWTP is experiencing pass-through. There may be cases where more frequent monitoring is appropriate, especially if a pretreatment system has been installed that requires frequent operational monitoring, such as a granular activated carbon system. There may also be situations where less frequent monitoring is reasonable, including situations where the source discharges infrequently or where progress milestones, such as the date for pretreatment system installation, dictate a more appropriate frequency. If your WWTP is experiencing pass-through caused by a confirmed PFOS source, ensure that the source is under the appropriate compliance schedule identified in your ERP and the source's discharge is being monitored for PFOS at least quarterly, or at an otherwise appropriate frequency.

### Local Limits Study

Some POTWs have sources but the effluent from the WWTP has remained in compliance with the PFOS WQS. In these cases, there is often limited WWTP effluent data so the WRD continues to encourage working with the sources to reduce PFOS. In some of these instances, the source has questioned the need for PFOS reduction since the WWTP has, so far, demonstrated compliance with WQS. The best way to determine if discharges from sources are at levels that will not cause pass-through at the WWTP is to perform a maximum allowable headworks study (also called a local limits study) to develop a technically-based local limit for PFOS. A technically-based local limit would establish a concentration (or mass) that can be safely discharged into the WWTP without passing through and causing a WQS exceedance. Once a technically-based local limit for PFOS is developed and sources are in compliance with that limit, regular compliance monitoring of the sources may be all that is necessary. If sources are unable to meet the local limit, PFOS reduction will be necessary. The WRD understands that technically-based local limits for PFOS are new in Michigan. The WRD will provide technical assistance with this effort if you choose to pursue this action. An EGLE-approved local limit, adopted locally, will provide a good basis for your compliance efforts while protecting water quality. Please note that if biosolids standards for PFAS are established and land application of biosolids is your practice, local limits would need to be reviewed to ensure that they are protective of your biosolids.

## **Local Limits and Landfills**

Technically-based local limits would be of particular value where a significant source of PFOS to the WWTP is landfill leachate. WWTPs and landfills are both passive receivers of PFAS. They both receive wastewater or waste containing PFAS that they had no role in generating. They often share a dependency on each other; the landfill needs the WWTP for leachate disposal or the WWTP needs the landfill for treatment residuals disposal. A WWTP with technically-based local limits for PFOS and/or perfluorooctanoic acid (PFOA), which is also often elevated in leachate, would be able to manage leachate acceptance safely. PFOS and/or PFOA local limits could be developed as mass or concentration-based limits. Leachate volumes could be managed to ensure acceptance will not cause or contribute to pass-through. Alternately, the local limits would serve as a basis for leachate pretreatment system design where needed.

## **Effluent Sampling and National Pollutant Discharge Elimination System Permit Limits**

In the December 3, 2019, IPP PFAS update letter, the WRD outlined its National Pollutant Discharge Elimination System (NPDES) permitting strategy for PFAS. The strategy titled, "Municipal NPDES Permitting Strategy for PFOS and PFOA," is available at: [https://www.michigan.gov/documents/egle/wrd-pfas-npdes-permitting-strategy\\_669197\\_7.pdf](https://www.michigan.gov/documents/egle/wrd-pfas-npdes-permitting-strategy_669197_7.pdf). As indicated in the December 3, 2019, letter, NPDES permits issued after October 1, 2021, may contain limits for PFOS and/or PFOA if a WWTP's effluent has reasonable potential to exceed the WQS. A compliance schedule might also be necessary in order to achieve this effluent limit.

To reduce the likelihood of permit limits for PFOS, it is recommended that POTWs continue source reduction efforts. Progress on source reduction efforts will help the WRD determine the most representative effluent dataset to calculate potential effluent quality. For example, if an industrial discharger installed pretreatment and WWTP effluent concentrations of PFOS have subsequently decreased, effluent data prior to pretreatment installation would not be considered representative of current effluent quality or used to determine reasonable potential of the effluent and potential permit limitations.

Additional recommendations include utilizing proper sampling and analytical methods, currently ASTM D7979 or an isotope dilution method (sometimes referred to as Method 537 modified), and a quantification level or reporting limit of 2.0 ng/L. If effluent PFOS is below quantification levels, low reporting limits may result in lower calculated potential effluent quality, which affects whether PFOS limits are included in permits and the frequency of monitoring. Rule 1211 (R 323.1211) of the Part 8 Rules, Water Quality-Based Effluent Limit Development for Toxic Substances, promulgated pursuant to Part 31 of the NREPA, describes in detail how WRD staff determine reasonable potential. Information summarizing the WRD's process for determining reasonable potential is also found in the enclosed WRD memorandum, "Water Resources Division (WRD) Guidance for Perfluorooctanesulfonic acid (PFOS) and Perfluorooctanoic acid (PFOA) Reasonable Potential Evaluations" (S. Heaton, May 6, 2020).

### **New Maximum Contaminant Levels**

On August 3, 2020, new regulations limiting seven PFAS chemicals in municipal drinking water went into effect. The following maximum contaminant levels (MCL) were adopted:

<b>Specific PFAS</b>	<b>Drinking Water MCL (parts per trillion [ppt])</b>
PFNA	6
PFOA	8
PFHxA	400,000
PFOS	16
PFHxS	51
PFBS	420
HFPO-DA	370

The new drinking water standards also update Michigan's existing groundwater cleanup criteria of 70 ppt for PFOS and PFOA. The new groundwater standards are 8 ppt for PFOA and 16 ppt for PFOS. The promulgation of the MCLs for PFOS and PFOA will not directly affect the surface WQS. An MCL differs substantially from a human health WQS for drinking water because an MCL applies only to the ingestion of finished drinking water and does not incorporate the various other exposure pathways used to generate a human health WQS. However, the toxicity data used to generate the MCLs will be reviewed when current human health WQS are updated and during the assessment of other PFAS for possible WQS development.

### **Fume Suppressant Study**

The WRD partnered with the United States Environmental Protection Agency (USEPA), Office of Research and Development, National Exposure Research Laboratory, to answer the question of whether current PFOS "replacement" products being used at chrome plating facilities were contributing to elevated PFOS in discharges from those facilities. In July 2019 the WRD worked with 11 chrome platers across the state to sample fume suppressant products and process wastewater after pretreatment for metals and pH but prior to any pretreatment for PFOS. These chrome platers agreed to participate in the study on a voluntary basis to provide valuable information to the plating industry. In summary, the study determined that none of the currently used fume suppressants contained detectable amounts of PFOS or PFOS precursors, which are specific longer-chain PFAS that could break down into PFOS. Current discharges of PFOS are, therefore, assumed to be associated with historical use of PFOS-containing products. On July 9, 2020, the WRD shared the results of this study via a webinar to assist industry with decisions on product use, cleanup, and treatment. A recording of the webinar can be found at: <https://register.gotowebinar.com/recording/8514035712476267021>. The detailed results of the report titled, "Study Results: Targeted and Nontargeted Analysis of PFAS in Fume Suppressant Products at Chrome Plating Facilities" is available at: [https://www.michigan.gov/documents/egle/wrd-ep-pfas-chrome-plating\\_693686\\_7.pdf](https://www.michigan.gov/documents/egle/wrd-ep-pfas-chrome-plating_693686_7.pdf).

## **Summary Report: PFAS Initiatives to Evaluate the Presence of PFAS in Municipal Wastewater and Associated Residuals (Sludge/Biosolids) in Michigan**

The WRD contracted with a consulting firm, AECOM Technical Services, Inc., to conduct a study in fall 2018 of 42 municipal WWTPs to evaluate the presence of PFAS in influents, effluents, and associated residuals (sludge/biosolids) generated at the facilities. As part of this initiative, screening of 22 land application sites was conducted to further the understanding of potential impacts to the environment from land-applied biosolids. Samples were analyzed for 24 PFAS compounds. Initial findings from the study found that PFAS were frequently detected in municipal wastewater, residuals, and at land application sites where biosolids were applied. Concentrations in residuals were similar or lower than concentrations identified in previous studies in the United States and other countries with industrial sources. Through implementation of the IPP PFAS Initiative and this statewide study, the WRD was able to identify six WWTPs with high PFOS concentrations in their WWTP discharge and biosolids/sludge and temporarily restrict land application from those facilities until sources of PFOS are controlled and concentrations in the residuals decrease. Screening of agricultural fields that received biosolids applications found significantly lower PFAS concentrations in various environmental matrices (soils, surface waters, etc.) associated with WWTPs with lower levels of PFAS in their biosolids as compared to those with elevated levels. A report that provides background and recent status updates of the IPP PFAS Initiative titled, "Summary Report: Initiatives to Evaluate the Presence of PFAS in Municipal Wastewater and Associated Residuals (Sludge/Biosolids) in Michigan," is available at: [https://www.michigan.gov/documents/egle/wrd-pfas-initiatives\\_691391\\_7.pdf](https://www.michigan.gov/documents/egle/wrd-pfas-initiatives_691391_7.pdf). A more detailed report is expected to be available by late summer 2020.

## **Industrial Sources of PFOS to Municipal WWTPs as Identified by the IPP PFAS Initiative**

Under the IPP PFAS Initiative, POTWs were asked to evaluate potential sources of PFAS via surveys, records reviews, and interviews with industry staff and to sample the effluent of those industries that were likely to have used PFOS and/or PFOA in the past or were currently using some type of PFAS-containing chemical in their processes. Sources of PFOS identified by POTWs under the initiative were similar to those identified in literature reviews. The majority of significant PFOS sources to WWTPs were landfills that accepted industrial wastes containing PFOS, metal finishers, and contaminated sites associated with industries or activities with PFOS usage. Other sources found included centralized waste treaters, paper/packaging manufacturers, commercial industrial laundries, chemical manufacturers, and sewers contaminated with aqueous film forming foams. A detailed discussion of PFOS sources, including source effluent ranges, percentages of confirmed sources by type, and other observations and conclusions found by the IPP PFAS Initiative and related WRD efforts can be found in the report titled, "Michigan Industrial Pretreatment Program (IPP) PFAS Initiative - Identified Industrial Sources of PFOS to Municipal Wastewater Treatment Plants," is available at: [https://www.michigan.gov/documents/egle/wrd-ipp-pfas-initiative-identified-sources\\_699494\\_7.pdf](https://www.michigan.gov/documents/egle/wrd-ipp-pfas-initiative-identified-sources_699494_7.pdf). We thank you for providing EGLE with the data needed to develop this report and anticipate that it will be helpful to WWTPs around the country that are starting to evaluate their own potential sources of PFAS.

## **Biosolids and PFOS**

Over the past two years, the WRD's efforts have focused largely on identifying WWTP biosolids with elevated levels of PFAS from industrial sources through the IPP PFAS Initiative and conducting a statewide study of 42 WWTPs and select land application field sites. In the absence of USEPA guidance or criteria, the WRD has dedicated significant resources to study and understand the presence of PFAS in WWTPs, biosolids, and in fields where biosolids have been land-applied. The summary report (described and linked above) discusses the WRD's threshold value for describing industrially impacted biosolids: biosolids that have a PFOS concentration of 150 micrograms/kilogram ( $\mu\text{g}/\text{kg}$ ) (parts per billion) or greater and where the WWTP has identified a significant industrial source(s) of PFOS to their sewer system. This threshold PFOS concentration is not a risk-based number but serves the purpose of identifying those facilities where additional source reduction efforts are required and/or where alternative land application strategies should be considered. Although only applying to a handful of WWTPs, land application programs of WWTPs identified as having industrially impacted biosolids were suspended. The WRD is focused on preventing industrially impacted biosolids from being land-applied while allowing the beneficial reuse of biosolids when appropriate.

It should be noted that the WRD's statewide WWTP study found median and average PFOS concentrations in biosolids that were not industrially impacted to be much lower than the threshold value. The median concentration was 11  $\mu\text{g}/\text{kg}$  and the average was 16  $\mu\text{g}/\text{kg}$ . As POTWs continue to implement source reduction efforts, the WRD expects PFOS concentrations to decrease further over time. The WRD plans to provide additional PFAS guidance to WWTPs concerning ongoing management of biosolids. As part of this process, the WRD is partnering with the Michigan Water Environment Association, Michigan Department of Agriculture and Rural Development, and Michigan Farm Bureau on the development of a fact sheet to aide WWTPs and land applicators in the communication of PFOS results to landowners and farmers.

EGLE will continue to work closely with other states and the USEPA to keep abreast of the latest data and science available.

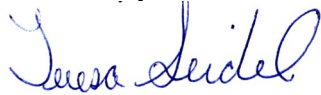
## **POTW PFAS Effluent Monitoring Report Form Changes**

The POTW PFAS Effluent Monitoring Report Form has been updated and now allows for the reporting of all 28 analytes on the Michigan PFAS Action Response Team's "PFAS Minimum Laboratory Analyte List" available at: [https://www.michigan.gov/pfasresponse/0,9038,7-365-88059\\_95747---,00.html](https://www.michigan.gov/pfasresponse/0,9038,7-365-88059_95747---,00.html). The WRD is requesting that all 28 analytes be reported to help further our knowledge about PFAS and assist in analyzing data for PFAS other than PFOS and PFOA.

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Thank you for your continued work to reduce and eliminate PFOS in Michigan's surface waters. EGLE appreciates the efforts and progress made by POTWs across the state. If you have questions or comments about this effort, please contact your Regional IPP PFAS Specialist. An IPP PFAS staff map showing coverages areas is located at:  
[https://www.michigan.gov/documents/deq/wrd-pfas-staff\\_614098\\_7.pdf](https://www.michigan.gov/documents/deq/wrd-pfas-staff_614098_7.pdf).

Sincerely,



Teresa Seidel, Director  
Water Resources Division  
517-284-5470

Enclosure

**MICHIGAN DEPARTMENT OF ENVIRONMENT, GREAT LAKES, AND ENERGY**

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**INTEROFFICE COMMUNICATION**

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TO: Phillip Argiroff, Assistant Director  
Water Resources Division

FROM: Sylvia Heaton, Supervisor  
Water Resources Division

DATE: May 6, 2020

SUBJECT: Water Resources Division (WRD) Guidance for Perfluorooctanesulfonic acid (PFOS) and Perfluorooctanoic acid (PFOA) Reasonable Potential Evaluations

**Introduction**

EGLE is required to develop water quality-based effluent limits (WQBELs) for toxic pollutants. The Part 8, Water Quality-Based Effluent Limit Development for Toxic Substances rules require WQBELs to be incorporated into National Pollutant Discharge Elimination System (NPDES) permits where toxic substances are or may be discharged into surface waters of the state at levels that have the reasonable potential (RP) to cause, or contribute, to an excursion above a water quality value. Michigan's R323.1211 of the Part 8 rules describes the process for determining RP. Reasonable potential is determined by developing preliminary effluent limitations (PELs) for a discharge and comparing the PELs to the potential effluent quality (PEQ) of the discharge. Rule R323.1211 (3)(a) and (b) are used to calculate the PEQ. Rule R323.1211 (3)(a) is used when 10 or more representative facility-specific effluent samples are available that are greater than the detection limit. If sufficient data are not available for use in the process described above, the PEQ shall be determined by using R323.1211 (3)(b). This subsection of the rule allows for the use of other scientifically defensible processes on a case by case basis to determine the PEQ. Specifically, the rules allow the department or permittee to use other methods to address facility specific effluent samples less than the detection limit.

The State of Michigan has been addressing Per- and Polyfluoroalkyl Substances (PFAS) in wastewater treatment plants (WWTP) to reduce and eliminate specific PFAS compounds from industrial sources that may pass through municipal WWTPs. Municipal WWTPs regulate their industrial users through an Industrial Pretreatment Program (IPP) required by their NPDES permit. As part of the statewide PFAS initiative, EGLE has required all municipal WWTPs with IPPs (95 statewide) to evaluate pass through of PFAS, specifically perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA), to surface waters and reduce and eliminate any sources



if found. Michigan currently has water quality standards (WQS) for two PFAS compounds, PFOS and PFOA.

Since February 2018, EGLE has worked with WWTPs to reduce or eliminate sources of PFAS in discharges through pollution prevention activities. Major sources of PFOS and PFOA to WWTPs include metal finishers, paper manufacturers, and businesses that treat fabric and leather that have used PFAS-containing compounds as well as those industrial users (such as landfills and centralized solid waste treatment facilities) that may have accepted wastes from the above sources. Although chemical manufacturing of PFOS and PFOA in the United States has been phased out, these chemicals may still be manufactured in other countries and imported to the United States. These persistent chemicals may also be found in factories that historically used the compounds in manufacturing processes. Sites contaminated by firefighting foams or PFAS-contaminated industrial wastes may also be sources for WWTPs if they discharge to the sanitary sewer.

### **PFOS and PFOA Reasonable Potential Evaluations**

In determining whether WQBELs are necessary to protect water quality, an evaluation must be made as to whether a discharge causes, has the reasonable potential to cause, or contributes to an excursion of WQS. The applicable WQS for PFOS is 12 nanograms per liter (ng/L) for streams that are not designated as a drinking water source, and 11 ng/L for those that are designated as a source. The applicable WQS for PFOA is 12,000 ng/L for surface waters that are not designated as drinking water source, and 420 ng/L for those that are designated as a source. When assigned a WQBEL review for a WWTP with facility specific effluent samples for PFOS and/or PFOA, Permit Section biologists will coordinate with the Emerging Pollutant Section and the NPDES compliance staff to obtain facility specific information related to source tracking, treatment installation and effectiveness, and other facility specific information related to PFOS and PFOA sources and effluent concentrations. Based on the extent of the information, it may be necessary to truncate datasets for these types of compounds. Truncating datasets can be considered when industrial sources of PFOS and/or PFOA to the WWTP have installed treatment, treatment is fully operational, and when effluent data is considered representative of current conditions. The remainder of this guidance will focus on PFOS due to the bioaccumulative and highly toxic nature of this specific compound.

Once the appropriate dataset for use in the reasonable potential determination has been identified, the evaluation will follow one of the options described below:

- If all data is reported as non-detect and the detection limit is below 11 ng/L, the review is complete and a limit for PFOS would not be recommended for inclusion in the draft NPDES permit.
- If there are more than 10 samples with detectable concentrations, the reasonable potential procedure outlined in R232.1211(3)(a) will be used.

- If there are less than 10 samples, all with detectable concentrations, biologists will utilize the procedure outlined in R232.1211(3).
- If there are less than 10 samples with a mix of both non-detect and detectable concentrations, biologists will utilize the procedure outlined in R232.1211(3).
- Initial reasonable potential evaluations would follow R 232.1211(3)(b). If no reasonable potential was identified, the review would be complete and a limit for PFOS would not be recommended for inclusion in the draft NPDES permit. If reasonable potential is identified, R232.1211 (3)(b) allows the department to utilize other methods to address values reported as less than the detection limit. The recommendation is to substitute the detection limit for non-detectable concentrations reported for PFOS when the following conditions have been met:
  - The detection and/or quantification level is less than 11 ng/L, and preferably 2 ng/L, based upon currently available analytical methods or subsequent methods approved by EPA, and stated in the NPDES Appendix to the Permit Application.
  - Laboratory reports have been reviewed to determine Quality Assurance/Quality Control measures have been met.
  - Pollutant Minimization and Source Evaluation Program reports submitted by the facility have been reviewed and approved.

If the above conditions are met, the detection and/or quantification level for non-detectable results will be substituted, and procedures outlined in R232.1211(3)(a) or (b) will be used for determining reasonable potential. If no reasonable potential is determined, a WQBEL for PFOS would not be recommended for inclusion in the draft NPDES permit. If reasonable potential is determined, a WQBEL for PFOS and appropriate monitoring would be recommended for inclusion in the draft permit.



cc: Chris Alexander, EGLE (via email)