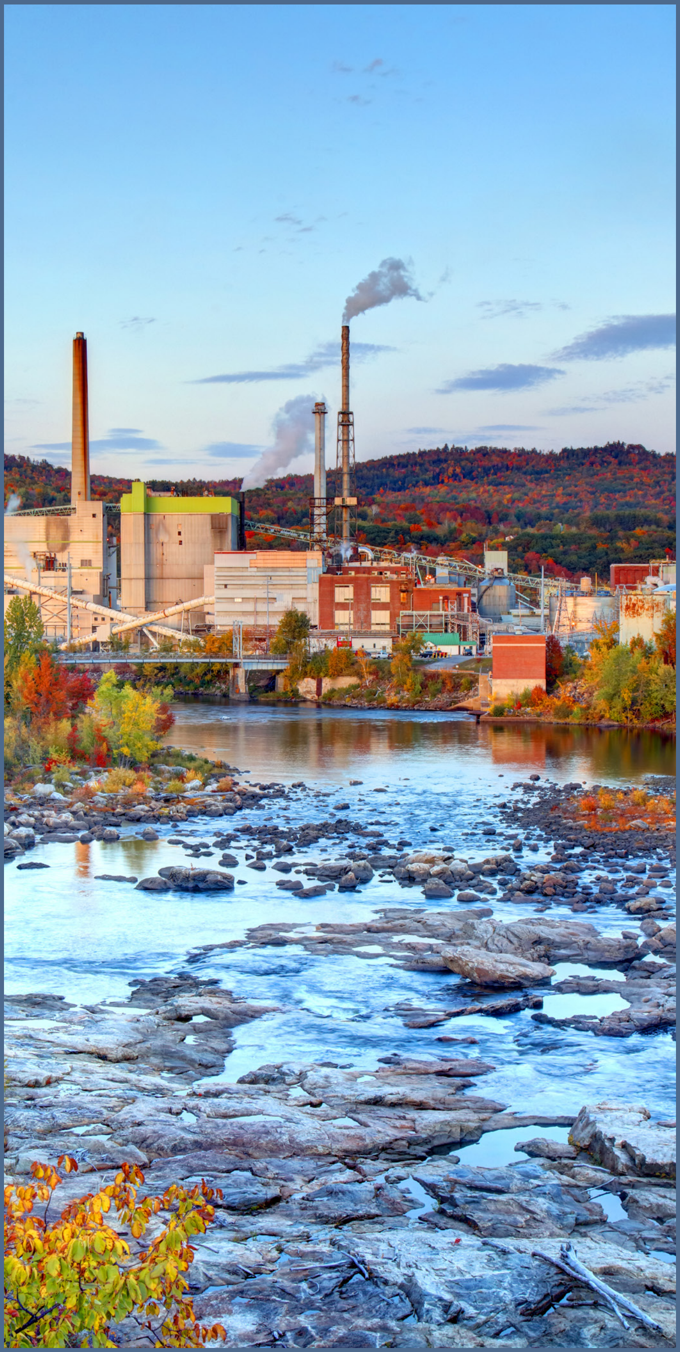

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PERSPECTIVES

PFAS Monitoring Requirements and Stormwater Pollution Prevention Under the 2026 NPDES Permit

Our perspectives feature the viewpoints of our subject matter experts on current topics and emerging trends.

INTRODUCTION

On December 13, 2024, the United States Environmental Protection Agency (EPA) published a request for public comment for the 2026 National Pollutant Discharge Elimination System (NPDES) general permit for stormwater discharges associated with industrial activity, also referred to as the 2026 Multi-Sector General Permit (MSGP). One of the proposed changes to the 2026 MSGP includes stormwater sampling protocols related to Per- and polyfluoroalkyl substances (PFAS) Indicator Monitoring.

Per- and polyfluoroalkyl substances are a group of thousands of man-made perfluorinated compounds that are water and oil-repellent, chemically and thermally stable, and which exhibit surfactant properties (Buck et al., 2011; EPA, 2022). PFAS chemicals have been manufactured and used in various industrial applications in the United States and around the globe since the 1940s. These substances are found in many products and are well known for uses associated with clothing, cookware, and firefighting foams. Their wide use is reported because PFAS chemicals are known for attributes such as heat, water, oil, and grease resistance, but they are also known as "forever chemicals" because they do not break down easily in the natural environment. Due to these properties, PFAS substances have been used in a wide range of industrial and consumer products with common uses, including wetting agents, lubricants, corrosion inhibitors, firefighting foams, and stain-resistant treatments for leather, paper, and clothing (EPA, 2022). As such, these chemicals have been detected in surface water, groundwater, soil, and air. Many PFAS chemicals are found in the blood of people and animals all over the world and are present at low levels in a variety of food products as well as the environment.

Because there are thousands of PFAS chemicals found in many different consumer, commercial, and industrial products it is challenging to study and assess the potential human health and environmental risks. Understanding more about the chemicals' exposure pathways may help determine how ambient or widespread a particular concentration's source might be and where it originated. Sector coverage associated with MSGP may help provide insight into those sources and exposure routes in order to isolate them so risks can be better understood.

SUMMARY OF THE PROPOSED 2026 NPDES MULTI-SECTOR STORMWATER PERMIT

The proposed 2026 MSGP permit covers a period of five years, 2026 through 2031. Once finalized, this permit will be available in areas where the EPA is the NPDES permitting authority. However, because most states adopt the EPA MSGP rule making, it is anticipated they will incorporate virtually identical requirements in the state issued general permits, thus affecting facilities across the US.

The proposed permit covers stormwater discharges from facilities in 30 different industrial sectors. The proposed 2026 MSGP includes 50 separate general NPDES permits covering areas within an individual state, Tribal land, US Territory, or federal facility. These 50 general permits contain provisions that require industrial facilities in 29 different industrial sectors to, among other things, implement control measures and develop site-specific stormwater pollution prevention plans (SWPPPs) to comply with NPDES requirements. In addition, the MSGP includes a thirtieth sector, available for the EPA to permit additional industrial activities that require permit coverage for industrial stormwater discharges not included in the other 29 industrial sectors.

DESCRIPTION OF MULTI-SECTOR GENERAL STORMWATER PERMIT CHANGES, INCLUDING PFAS MONITORING PROVISIONS

Changes to the proposed 2026 MSGP includes a new provision requiring certain operators to conduct quarterly "report only" indicator monitoring for PFAS for the entire permit term. The proposed MSGP does not have a benchmark threshold or a baseline value for

Sector A – Timber Products	Sector S – Air Transportation Facilities
Sector B – Paper and Allied Products Manufacturing	Sector T – Treatment Works
Sector C – Chemical and Allied Products Manufacturing	Sector U – Food and Kindred Products
Sector D – Asphalt Paving and Roofing Materials Manufacturers and Lubricant Manufacturers	Sector V – Textile Mills, Apparel, and Other Fabric Products Manufacturing
Sector F – Primary Metals	Sector W – Furniture and Fixtures
Sector I – Oil and Gas Extraction	Sector X – Printing and Publishing
Sector K – Hazardous Waste Treatment Storage or Disposal	Sector Y – Rubber, Miscellaneous Plastic Products, and Miscellaneous Manufacturing
Sector L – Landfills and Land Application	Sector Z – Leather Tanning and Finishing
Sector M – Automobile Salvage Yards	Sector AA – Fabricated Metal Products
Sector N – Scrap Recycling Facilities	Sector AB – Transportation, Equipment, Industrial or Commercial Machinery
Sector P – Land Transportation	Sector AC – Electronic, Electrical, Photographic and Optical Goods
Sector R – Ship and Boat Building or Repairing Yards	

Table 1. *Sector Categories Covered Under Proposed PFAS Provision*

comparison, nor does it require follow-up actions. This applies to the 40 PFAS compounds listed in EPA Method 1633, Analysis of Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids and Tissue Samples by LC-MS/MS (EPA 2024). Additionally, the EPA recently published aquatic life criteria for Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS) as well as Clean Water Act Aquatic Life Benchmarks for PFAS (89 FR 81077) that could be considered a benchmark monitoring threshold(s).

The new provision for "report-only" indicator analytical monitoring will include quarterly monitoring (four times per year) beginning in the first full quarter of the permit coverage. This requirement applies to all operators in the selected final 23 associated sectors as those are likely to have PFAS exposure to precipitation (Table 1).

PFAS CONTAMINATION IN STORMWATER: SOURCES, RISKS, AND ENVIRONMENTAL IMPACT

Toxicological studies have raised issues regarding the persistence, bioaccumulation, and potential health concerns of some PFAS. Naturally occurring defluorinating enzymes (i.e., enzymes capable of breaking a carbon-fluorine bond) are rare, so there is a lack of natural biodegradation and abiotic degradation processes for PFAS in the environment (Stockbridge and Wackett, 2024). Some natural processes have been shown to break down PFAS substances into other PFAS compounds that may be more stable and more resistant to degradation and, therefore, more persistent and potentially harmful to human health and the environment (U.S. EPA, 2023).

PFAS can migrate from a site through precipitation and stormwater runoff (Sharifan, 2021). Due to PFAS' water solubility, when one of these substances enters a waterbody, it tends to remain dissolved in the water column and sediment pore water or are taken up and assimilated by aquatic or aquatic-dependent organisms (EPA, 2022). PFAS can negatively affect aquatic life, especially benthic macroinvertebrates (Åkerblom, 2017; Babut et al., 2017; Chong et al., 2013; Groffen et al., 2018), fish (Valsecchi et al., 2021), or aquatic-dependent life such as riparian organisms (Koch et al., 2020). PFAS in stormwater may also adversely affect human health through exposure from recreational activities, harvesting and consuming a quatic or aquatic-dependent species, and through drinking water depending on the proximity of stormwater discharges to public water supplies including groundwater. PFAS concentrations in stormwater from industrial sites are anticipated to be higher than in stormwater from urban areas (Renz, 2023).

Industrial facilities that are known or suspected dischargers of PFAS belong to the following 11 identified classes:

- Organic chemicals, plastics, and synthetic fibers.
- Metal finishing and electroplating.
- Electrical and electronic components.
- Textile mills.
- Landfills and treatment works.
- Leather tanning and finishing.
- Plastics molding and forming, paint formulating, pulp, paper, and paperboard.
- Airports.

MANAGING PFAS RISKS IN STORMWATER: STRATEGIES FOR FACILITY OPERATORS

Facility operators should be aware of the potential risks associated with managing PFAS. A key step is to determine whether operations, process steps, equipment, raw materials, chemical use, and storage at the facility are potential sources of PFAS contamination. Measures used to identify PFAS include screening tools, facility audits, reviewing supplier questionnaires, assessing chemical safety data sheets (SDSs), cataloging chemicals containing known PFAS substances, and conducting baseline samples. If PFAS chemicals are suspected or known to be onsite, then the next step is to manage exposure and release through filtration, chemical treatment, and using alternative products and practices. Contacting environmental experts, a state environmental protection agency, or health department for additional information and support may be beneficial.

Facility operators should establish site-specific best management practices (BMPs) to manage potential contamination of stormwater discharges. BMPs include the development of a site work plan, substituting alternative products, installation of pretreatment systems, reduction and elimination of PFAS discharges, chemical inventory, safe storage, replacement of contaminated equipment, management/disposal planning, proper PPE, response plans, and employee education and training.

There are no associated discharge limits for PFAS in the proposed 2026 MSGP. Benchmark limits and other criteria limits could result from the data collected during the five-year MSGP period resulting in more stringent requirements leading to changes, modifications, and management of stormwater at your facility. Long-term planning is invaluable and allows facility operators to stay informed and in front of these regulations.

EVALUATING THE IMPACTS OF PFAS DATA COLLECTION ON STORMWATER MANAGEMENT

The EPA determined the sectors listed above (Table 1) are likely to have industrial activities with potential PFAS exposure to precipitation which could result in the discharge of PFAS in stormwater. PFAS indicator monitoring data will provide facility operators and the EPA with a baseline and comparable understanding of industrial stormwater discharge quality with respect to discharges of PFAS at these facilities. The EPA stated plan is to use the indicator monitoring data collected to conduct an initial quantitative assessment of PFAS levels in industrial stormwater, further identify industrial activities with the potential to discharge PFAS in stormwater, and inform future consideration of potential PFAS benchmark monitoring for sectors with the potential to discharge PFAS in stormwater (Part 4.2.1. of the 2026 MSGP-proposed). While the proposed inclusion of PFAS data collection effort is “report only” at this time, it is likely to become a component of benchmark monitoring to gauge a facility’s stormwater control measure (SCM) because of its known prevalence in various industries and negative contributions to aquatic life.

EPA is recommending Method 1633 for PFAS analysis of stormwater under the proposed MSGP. Additionally, EPA considers Method 1621 as an option and is requesting comments as to the appropriateness of adding Method 1621 as an addition to Method 1633. While Method 1621 can broadly screen thousands of organofluorines at the part-per-billion level in aqueous samples, the analysis only shows organofluorines as a combined total concentration. It does not identify which specific organofluorines are present. However, EPA Method 1633 is more sensitive and selective than EPA Method 1621. Method 1633 precisely measures 40 specific PFAS compounds at the part-per-trillion level in various aqueous, solid, biosolid, and tissue samples. While stormwater was not a tested environmental matrix for EPA Method 1633, the method is recommended for use in NPDES permits and contains all the required quality control (QC) procedures for the CWA.

Proposed stormwater sampling for PFAS brings new complexities to the typical stormwater sampling required by the MSGP. Facility operators will need to consider the availability of certified laboratories with proper credentials for testing PFAS, sampling procedures, costs, turnaround, lab results, and monthly reporting.

ANTICIPATING FUTURE PFAS REGULATIONS: PREPARING FOR CHANGES IN STORMWATER MANAGEMENT

The five-year, 2026 MSGP period could be considered a grace period ahead of future rulemaking resulting from the PFAS data collection process. The five-year period is an opportunity for facilities to develop management strategies, protocols, BMPs, and make modifications in the use of PFAS and their reduction in PFAS discharges to stormwater.

The EPA is currently requesting comments on the proposed modifications and all parts of the proposed permit. Now is the time for facilities to provide specific comments on the proposed MSGP including the new or modified requirements. The EPA is requesting comments on the following proposed provisions in addition of PFAS monitoring:

- Request for comment on requiring PFAS indicator monitoring using Method 1621, Determination of Adsorbable Organic Fluorine (AOF) in Aqueous Matrices by Combustion Ion Chromatography (CIC), in addition to Method 1633.
- Request for comment on whether PFAS-related benchmark monitoring should be applied to some, or all, of the sectors identified for PFAS-indicator monitoring. The EPA recently published aquatic life criteria for PFOA and PFOS, as well as Clean Water Act Aquatic Life Benchmarks for PFAS (89 FR 81077) that could be considered benchmark monitoring threshold(s).

The 2026 MSGP comment period is currently set to close on April 4, 2025. Important considerations for facility operators regarding PFAS stormwater monitoring include:

1. Is Method 1621 an appropriate analysis method for testing PFAS in stormwater?
2. Is there data to support sector-specific level benchmarks?
3. If PFAS are detected in the quarterly stormwater sampling what are the implications? What does this mean for my facility?
4. What does the state expect me to do if PFAS are detected during the five-year permit period?
5. If PFAS are detected in stormwater will this trigger additional monitoring for the receiving water (i.e., antidegradation policies)?
6. Could this lead to total maximum daily loads (TMDLs)?
7. What PFAS alternatives are available for use at my facility?
8. Are there treatments for removing PFAS? What are they? What is the cost?

SUMMARY: HOW EXPERTS CAN HELP

Facility operators have enough time to plan and prepare for the new stormwater requirements for PFAS, and it is advisable to enlist the help of experts early on.

A seasoned and experienced technical team managing PFAS including site work plans, chemical inventories, development of best management practices, waste management, remediation, and other environmental risks and compliance related to stormwater management can help reduce or eliminate unnecessary challenges and risks during regulatory transitions.

ACKNOWLEDGMENTS

We would like to thank Bill Stephens, PhD and Kurtis Schlicht for providing insights and expertise that greatly assisted this research.

MORE ABOUT J.S. HELD'S CONTRIBUTOR

Bill Stephens is a Senior Project Manager – Impact Assessment & Permitting, Technical Solutions in J.S. Held's Environmental, Health & Safety Practice. Bill's natural resource career includes multi-community bio-assessments, aquatic ecology, fishery assessments and aquaculture management, biomonitoring and ecosystem management, aquatic ecotoxicology, environmental chemistry, and surface water monitoring and assessments. Bill's professional work experience spans 41 years with 15 years as an environmental consultant and 26 years in the aquaculture industry. Collaborative work with consultants, industries, researchers, and regulators through field studies and assessments, wetland delineations, agency negotiations, and permitting have fueled his search for effective compliance solutions and appropriate management practices supporting a sustainable economy and maintaining ecosystem integrity. His knowledge, skills, and abilities allow him to interact with multiple stakeholders to prevent and solve problems.

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