



**PENNSYLVANIA PUBLIC WATER SYSTEM**

# PFAS TOOLKIT

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**APRIL 2024**





## Introduction

In January 2023, Pennsylvania's Environmental Quality Board finalized a new rule creating maximum contaminant levels (MCLs) and maximum contaminant level goals (MCLGs) for two PFAS – perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS). To prepare for implementation of this rule, including routine monitoring by public water systems (PWSS), the Pennsylvania Department of Environmental Protection (DEP or the Department) has compiled the following information and resources about funding, communication, and treatment options for PWSS that may detect PFAS or PFOS in their sampling or discover a PFOA or PFOS MCL exceedance. DEP is committed to supporting PWSS, especially small PWSS and PWSS serving disadvantaged or environmental justice communities, as they comply with this new rule.

## What are PFAS?

Perfluoroalkyl and polyfluoroalkyl substances (PFAS) are a unique class of chemicals used in industrial and manufacturing applications. Their widespread use is due to their exceptional ability to repel water and oils, reduce friction, and resist heat.

## Where do PFAS come from?

Common items containing pfas include: non-stick pans (like teflon), fast food wrappers, cosmetics, carpets (like scotchgard), fire resistant textiles, fire-fighting foams, paints, clothing (like gore-tex), and more. Consequentially, products containing one or more PFAS are now ubiquitous in our lives.



## What are Pennsylvania's Maximum Contaminant Levels for PFAS in drinking water?

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Pennsylvania's PFAS MCL Rule was published in the Pennsylvania Bulletin on January 14, 2023 (see 53 Pa.B. 333). This rule establishes MCLs and MCLGs for PFOA and PFOS – which are two of the more common and persistent PFAS chemicals detected in the human body in published toxicological studies as of 2022. The MCLs and MCLGs set by this rule, in nanograms per liter (ng/L) or parts per trillion (ppt), are:

	<b>MCLG (NG/L OR PPT)</b>	<b>MCL (NG/L OR PPT)</b>
<b>PFOA</b>	<b>8</b>	<b>14</b>
<b>PFAS</b>	<b>14</b>	<b>18</b>

Although the rule applies to all PWSs in the Commonwealth, monitoring requirements under the rule are applicable to community water systems (CWSs), nontransient noncommunity water systems (NTNCWS), and bottled, vended, retail, and bulk hauling water systems (BVRBs). Initial monitoring is required quarterly for four consecutive calendar quarters at each entry point (EP) to the distribution system, beginning January 1, 2024 for PWSs serving more than 350 persons and for BVRBs, and January 1, 2025 for CWS and NTNCWS serving 350 or fewer persons. Repeat monitoring is quarterly, annual, or triennial, based on whether analytical results show detections of PFOA and/or PFOS and at what level. Compliance with the MCLs is determined based on a running annual average (RAA) at each EP; if any quarterly result causes the RAA to exceed an MCL, a violation is incurred for that quarter.

In addition to the monitoring and reporting requirements, Pennsylvania's PFAS MCL Rule also establishes MCL violations as a Tier 2 violation requiring issuance of Tier 2 public notice (PN) and requires CWSs to report results in their annual Consumer Confidence Report (CCR). The rule also establishes analytical requirements (including approved methods for analysis and minimum reporting limits) and approved treatment technologies (including granular activated carbon (GAC), ion exchange, and reverse osmosis), with the option of other treatment technologies that may be approved by the Department if the technology is demonstrated to provide an adequate and reliable quantity and quality of water.

## PFAS Monitoring

There are three test methods currently approved by the United States Environmental Protection Agency (EPA) for detecting PFAS in drinking water: EPA Method 533, EPA Method 537 v1.1, and EPA Method 537.1. Method 533 analyzes for 25 PFAS compounds and includes more short-chain PFAS compounds, Method 537.1 analyzes for 18 PFAS compounds, and Method 537 v1.1 analyzes for six PFAS compounds. EPA Methods 533 and 537.1 can be used to detect the six PFAS that are included in the EPA's proposed PFAS regulation. (see EPA's [Proposed PFAS National Primary Drinking Water Regulation webpage](#) for details and background on EPA's rule-making).

## Pennsylvania-accredited laboratories

Each water system will need to make arrangements with a Pennsylvania-accredited laboratory to conduct compliance monitoring required under Pennsylvania's PFAS MCL Rule. The specifics of those arrangements – including sample bottles, sample collection, delivery to the lab, etc. – will need to be worked out between the individual water system and the lab.

Labs accredited by Pennsylvania for analysis of PFAS by one of the approved methods identified in Pennsylvania's PFAS MCL Rule can be found on [DEP's Laboratory Accreditation Program webpage](#) under the heading "Search Environmental Laboratories" (select: [Search PA Accredited Environmental Laboratories Link](#)).





# What to do if your water system detects PFAS in your water?

All results from compliance monitoring are to be reported by the lab conducting the analyses to DEP's Drinking Water Electronic Lab Reporting System ([DWELR](#)). If PFOA or PFOS are detected in drinking water samples above their respective MCL values, the water supplier is required to notify the Department **within one-hour** of learning of those results from the lab. DEP has a 24-hour Emergency Response hotline (**1-800-541-2050**) for reporting MCL exceedances after normal business hours.

If any PFAS sample results for your water system show the presence of PFOA or PFOS in drinking water, then you should:

- **INFORM YOUR CUSTOMERS**

Community water systems are required to include results of detected contaminants in the water system's annual CCR. CCR templates are available on DEP's [eLibrary](#). Additionally, any water system that incurs an MCL violation is required to issue Tier 2 PN to consumers within 30 days. PN templates and more information on public notification requirements are available on [DEP's public notification webpage](#).

Note that water suppliers are also required to report results of detected contaminants in their annual CCR for monitoring conducted under the EPA's Fifth Unregulated Contaminant Monitoring Rule (UCMR 5). EPA has fact sheets on [PFAS in public water systems](#) available that can assist with helping you inform your customers. EPA also has a fact sheet for [communities](#).

- **CONTINUE MONITORING**

Water suppliers should continue to conduct quarterly monitoring to track PFAS levels and determine whether the RAA has been exceeded. If the RAA is exceeded and an MCL violation occurs, additional monitoring may be necessary to evaluate source water quality and to inform next steps.

- **LIMIT CUSTOMER'S EXPOSURE**

There are different ways to reduce risks from PFAS. Both treatment and non-treatment options are shared in the "Mitigation" section of this toolkit below.



## Mitigation

Please contact Safe Drinking Water staff at your DEP [Regional Office](#) to discuss your mitigation options. See the “Consultation with DEP” section of this toolkit for more information.

### NON-TREATMENT OPTIONS

In both the short- and long-term, alternatives to treatment can, in some cases, be more cost-effective and require less maintenance. Public water systems with exceedances of Pennsylvania’s MCLs for PFOA or PFOS may be eligible for PENNVEST funding to implement these alternatives. Please see the “Funding” section of this toolkit for more information.

- **Evaluate existing sources and, if feasible take impacted sources offline** – For systems with multiple sources already permitted by PADEP, the systems can evaluate and determine which sources are impacted by PFAS and which are not. This may allow you to maximize usage of unimpacted sources, and potentially reduce PFAS levels in drinking water served to customers if your water meets all other water quality parameters.
- **Consider interconnections with a nearby water system or PWS consolidation** – Purchase water from an adjacent, unimpacted water system or consider consolidation. Although alternative water sources may require transmission lines and adjustments to existing distribution systems, obtaining treated water through a DEP permitted interconnection with a nearby system may be the best source of alternative drinking water.
- **Develop a new source** – Before developing a new source (e.g. DEP permitted ground water well), it is important to work with your hydrogeologist to assess the hydrogeology and the water quality of the area and potential well sites. The PFAS contaminant plume needs to be assessed to ensure the new well is properly placed so that it will not be impacted now or in the future.



## TREATMENT OPTIONS

Approved treatment technologies for PWSs to treat PFAS contamination in Pennsylvania include granular activated carbon (GAC), ion exchange, and High-pressure membranes (reverse osmosis or nanofiltration). DEP may approve other technologies if it has been proven to reliably and consistently remove the specific PFAS contamination.

The selection of the most effective treatment process as a method to remove PFAS contamination will require a system-specific evaluation of the PFAS contaminant present, feed water quality, treatment objectives, and other considerations.

GAC contactors are widely used for PFAS removal and the technology is available as stand-alone treatment units, package treatment skids and mobilized treatment trailers. Raw water quality must be thoroughly evaluated as there is the possibility of competition for adsorption from organics and other contaminants which may reduce the effectiveness of treatment. Pre-treatment may be appropriate to remove competing contaminants and iron and manganese. GAC is also generally more effective at removing long-chain PFAS over short-chain PFAS, as long-chain PFAS have a higher affinity for adsorption to carbon. Treatment should be designed for the specific PFAS present. Bituminous GAC must be backwashed and filtered to waste to remove arsenic. This can potentially create large quantities of wastewater which requires disposal via truck or approved sanitary sewer each time media is changed.

Ion exchange is another treatment process capable of removing some types of PFAS, depending on the resin used. They are single use systems that generally do not create as much wastewater as bituminous GAC; however, it does require proper disposal and replacement of the resin. Efficiency of treatment is reduced in the presence of organics, total dissolved solids, and minerals which can clog the ion exchange resin. Ion exchange may be more effective at removing short-chain PFAS than GAC.

High-pressure membrane filtration can remove multiple contaminants including PFAS. There are two types of high-pressure membrane filtration: reverse osmosis (RO) and nanofiltration; RO has been shown to have a higher removal efficiency for PFAS. Research has shown that high-pressure membranes are over 90% effective at removing a wide range of PFAS chain lengths including the short chain compounds. RO has been successfully combined with GAC for higher overall removal rates. Pretreatment may be required due to the high susceptibility of fouling, and post-treatment mineral addition may be necessary for stabilization.

Waste considerations are important for these membranes as it may be challenging to find an acceptable means of discharging or treating the reject water produced by the process.



## CONSULTATION WITH DEP

A PFAS MCL exceedance will require the water system to consult with DEP and submit a corrective action plan. The consultation process generally begins with a pre-application meeting to discuss the permitting requirements. This is a good time to discuss and explore options for mitigation. DEP may also provide technical assistance to qualifying water systems to help systems evaluate their options and navigate through the permitting process. Applicants should contact their Regional Office and ask for the Safe Drinking Water Tech Chief for more information.

## Funding

### PENNVEST

PENNVEST is strategically positioned to provide funding assistance to PWSs to address PFAS compliance. With the signing of the Infrastructure Investment and Jobs Act (IIJA), also commonly known as the Bipartisan Infrastructure Law, PENNVEST has the unique opportunity to take advantage of over \$200 million to address PFAS funding over the next five years through the Drinking Water State Revolving Fund (DWSRF). These funds, along with other state and federal funds allows PENNVEST to maintain an annual program budget of \$1 Billion per year in low interest loans, principal forgiveness loans (a federal form of non-repayment funds), grants, and guarantees.

The first step to accessing funding is to schedule a planning consultation with a PENNVEST Project Specialist at Regional Assistance Map ([pa.gov](https://pa.gov)). During the planning consultation, the Project Specialist will review the electronic application process, eligibility, application cutoff and Board Meeting dates, and answer questions regarding PENNVEST funding program.

PENNVEST is a construction-ready program, so all permits and approvals must be in place at the time of application cutoff. PWSs are encouraged to act sooner, rather than later, to realize the benefits of this once in a generation opportunity of funding to address PFAS.

### Additional Resources and Links

- [ITRC PFAS Training Modules - YouTube](#)
- [Per- and Polyfluoroalkyl Substances \(PFAS\) | US EPA](#)
- [Learn about PFAS | ATSDR \(cdc.gov\)](#)
- [PFAS \(pa.gov\)](#)
- [PFAS MCL Page](#)
- [DEP Regional Offices \(pa.gov\)](#)





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