The PFAS Problem:

How Regulators Are Responding and What It Means for Drinking Water

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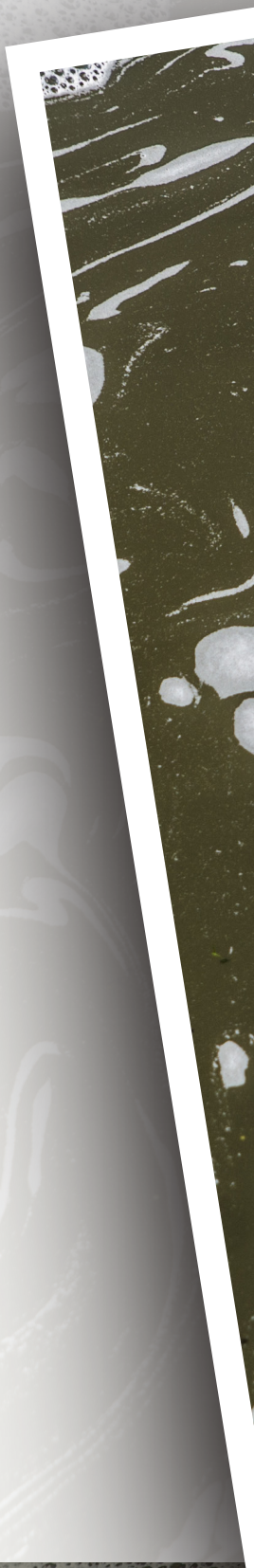

Key Takeaways

Water system operators need to understand evolving initiatives and enforcement risks related to PFAS.

Some steps the US Environmental Protection Agency might take to remediate PFAS contamination could have wide-ranging consequences for public water delivery and treatment systems.

Utilities can help themselves by keeping their compliance programs robust and building goodwill within their communities and with regulators at all levels.

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The safety and efficacy of public drinking water treatment and delivery systems has faced heightened scrutiny in the wake of recent public health crises and increased regulatory focus on reducing lead and copper contamination in drinking water. Because of their chemical characteristics and potential health effects, per- and polyfluoroalkyl substances (PFAS) are an emerging class of contaminants facing the water industry. There are currently several state-led remediation efforts in the United States and, notwithstanding the Trump administration's general deregulatory agenda, the US Environmental Protection Agency (USEPA) has identified PFAS in drinking water as a national priority. Private litigation is also proliferating around the United States.

This article provides a survey of some of the evolving initiatives and enforcement risks related to PFAS to assist water system operators understand and prepare for potentially costly upgrades, potential remediation requirements, and close communication and collaboration with regulatory authorities.

Background on PFAS

PFAS is an umbrella term for a family of thousands of synthetic organic compounds containing fluorine atoms. Some of the most commonly discussed compounds are perfluorooctane sulfonate (PFOS), perfluorooctanoic acid (PFOA), and hexafluoropropylene oxide dimer acid and its ammonium salt (collectively, *GenX*).

Why Was It Used?

PFAS were first invented in the 1930s and produced commercially from the 1940s until recently. Because of their nonstick tendencies and heat and stain resistance, these compounds have been used in a wide range of commercial and consumer products, from carpet and nonstick cookware to winter jackets and some firefighting foams—the latter used historically to suppress fires at petrochemical refineries—at airports, and on military bases. As analytical instruments have greatly improved over recent decades, PFAS are more frequently detected in groundwater and in topsoil. Consequently, certain PFAS compounds are increasingly taking on the complexion of other ubiquitous compounds, such as methyl *tert*-butyl ether (MTBE) or glyphosate, that have been the subject of scientific study, regulatory oversight, and private litigation for years.

Like those other pervasive compounds, the scientific literature has identified potential links between the substances and a variety of adverse human health impacts, such as reproductive and developmental, liver and kidney, and immunological effects. Other studies have also found that certain PFAS caused tumors in lab animals.

Why Has It Remained in the Environment?

Recently, US industries have begun a general phaseout of some PFAS (like PFOS and PFOA). For example, 3M stopped production of PFOS in the early 2000s, and PFOA production in the United States has been slowly phased out through USEPA's PFOA Stewardship Program, launched in 2006. However, many other PFAS chemicals are still in use, and PFOS and PFOA are still manufactured abroad and found in consumer products imported into the United States. Some scientific literature has also indicated that PFAS compounds are generally persistent in the environment and in the human body, slow to break down, and accumulate over time. PFAS distribution in the environment is uneven: there are "hot spots" of elevated levels in groundwater supplies, usually concentrated around industrial manufacturing facilities, petroleum refineries, military bases, and areas where firefighters are trained with firefighting foam.

To date, the United States has been operating without a national standard for levels of PFAS deemed "safe" for human exposure. Individual states have stepped in with their own regulatory regimes, and some (like New York) have been very active. In February 2019, however, USEPA released a long-awaited PFAS Action Plan, which lays out a variety of federal regulatory steps the agency plans to take in the near term to remediate PFAS contamination and address concerns that PFAS have negative effects on human health. Some of these steps may have wide-ranging consequences for public water delivery and treatment systems.

USEPA's Role in Regulating PFAS

Although USEPA still hasn't instituted uniform national standards for PFAS, the agency has taken a number of steps in recent years to study PFAS contamination in preparation for more direct regulatory action.

USEPA's Historical Treatment of PFAS

In 2016, USEPA issued drinking water health advisories for PFOA and PFOS. The agency set the health advisories

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at 70 ng/L, either individually or combined (if found in the same drinking water supply). These standards are nonbinding, nonregulatory, and meant to provide technical information to state agencies and other public health officials on health effects, analytical methodologies, and treatment technologies associated with drinking water contamination.

In spring 2018, USEPA convened a National Leadership Summit on PFAS, inviting representatives from federal and state agencies, municipalities, industry, and nongovernmental organizations to convene and discuss the environmental and human health effects from these chemicals. Later that summer and fall, USEPA representatives met with communities in five states (Colorado, Kansas, New Hampshire, North Carolina, and Pennsylvania) and tribal representatives to gather information to better develop a comprehensive PFAS action plan. In November 2018, USEPA published a standardized drinking water laboratory testing method for numerous PFAS compounds (called Method 537.1). That same month, the agency issued a draft toxicity assessment for GenX compounds and perfluorobutane sulfonic acid, including proposed numerical toxicity values (called oral reference doses) associated with noncancerous human health effects following oral exposure to these compounds.

USEPA's PFAS Action Plan

In February 2019, USEPA released its PFAS Action Plan (EPA 823R18004), which "describes the USEPA's approach to identifying and understanding PFAS, approaches to addressing current PFAS contamination, preventing future contamination, and effectively communicating with the public about PFAS." The action plan outlines numerous regulatory and enforcement changes that USEPA is developing, many of which could require managers of public drinking water delivery and treatment systems to invest in major infrastructural upgrades or could lead to government enforcement actions and remediation requirements.

For example, USEPA states in the action plan that by the end of 2019, it plans to propose a regulatory determination related to whether it will set a Safe Drinking Water Act (SDWA) maximum contaminant level (MCL) for PFOA and PFOS. If the agency sets such an MCL, it will become an enforceable cleanup standard applicable to "public water systems." USEPA could also potentially invoke its "emergency authority" under Section 1431 of the SDWA to require contributors to groundwater and drinking water contamination to take action to reduce or prevent exposures. Also under its SDWA authority, USEPA has stated its intention to propose nationwide drinking water monitoring for other PFAS compounds under the upcoming Unregulated Contaminant Monitoring Rule (UCMR) monitoring cycle. The UCMR allows the agency to collect data for contaminants that are suspected to exist in drinking water but do not yet have health-based standards set under the SDWA.

All of these proposals have the potential to dramatically transform the responsibilities of and risks to public drinking water system delivery and treatment operators nationwide after detecting PFAS contamination in their source water.

Interim Cleanup Proposals

Per the action plan, USEPA is also developing Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and Resource Conservation and Recovery Act interim cleanup recommendations to address PFOA and PFOS in groundwater, which USEPA will open to public comment. Also under CERLCA, USEPA is considering whether to list PFOS and PFOA as "hazardous substances," which would extend CERCLA order and cost recovery authorities to address PFOS/PFOA contamination in soil or groundwater.

All of these proposals have the potential to dramatically transform the responsibilities of and risks to public drinking water system delivery and treatment operators nationally in the event that PFAS contamination is detected in a system's source water. And the regulatory landscape is shifting very quickly: by the time you read this article, it's possible that federal or state regulators may have already promulgated some of the proposals we've highlighted.

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Other Federal PFAS Initiatives

Agency for Toxic Substances and Disease Registry

USEPA is not the only federal agency that can act to regulate PFAS. In June 2018, the Agency for Toxic Substances and Disease Registry (ATSDR) released a draft toxicological profile for several PFAS compounds, which asserted that potential adverse human health effects from certain PFAS can occur at very low levels of exposure. ATSDR also has the power to develop health-based values of different chemicals of concern,

called minimum risk levels, or MRLs, which can help inform regulatory decision-making at other federal agencies.

Congressional Action

Members of Congress have signaled growing interest in passing PFAS-focused federal legislation as well as taking actions to pressure USEPA action on PFAS regulations. In January 2019, a bipartisan group of representatives from Michigan proposed H.R. 535 (the PFAS Action Act), which would require USEPA to designate all PFAS chemicals as CERCLA "hazardous substances" within one year of enactment. That same month, a bipartisan group of 20 representatives created a Congressional PFAS Task Force to focus on conducting PFAS hearings, developing new PFAS legislation, and federally funding PFAS cleanups. A bipartisan group of senators has also issued a letter to USEPA requesting that it set enforceable drinking water standards for PFOS and PFOA. At the time of this writing, the Senate was considering including PFAS provisions in the National Defense Authorization Act. Recently, the House of Representatives also passed a bill that would require certain PFAS chemicals to be listed as "hazardous substances" under CERCLA and also require technology-based effluent limits to be established under the Clean Water Act. This conflicts with a complementary Senate bill that excluded listing PFAS under CERCLA but would require PFAS chemicals to be addressed under the SDWA, Toxic Substances Control Act (TSCA), and TRI. As of this writing, these bills have not been harmonized or signed into law.

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State Action to Regulate PFAS

Operators of public drinking water treatment and delivery systems are bound not only by federal requirements—states have a major role to play as well. As discussed previously, in the absence of national PFAS standards set by USEPA, individual states have been developing robust PFAS regulatory regimes and initiating remediation. Many of these states have also set hazard limits for certain PFAS compounds that are lower than the federal health advisories issued by USEPA.

In New York, for example, the state department of environmental conservation now regulates PFOA and PFOS as hazardous substances under state law and imposes requirements for storage and cleanup of these chemicals. The state's Drinking Water Quality Council has also recommended that the New York Department of Health (the state's lead agency for local water supply concerns) adopt MCLs of 10 ng/L for PFOA and PFOS. The state has also required remedial action in the Hoosick area to remediate PFOS and PFOA contamination in water supplies.

In July, New Hampshire adopted the most stringent enforceable drinking water and groundwater quality standards for PFAS in the country. Environmental and public health agencies in Michigan, New Jersey, and Vermont have been similarly active.

Best Practices for Public Water System Operators

In this environment of heightened regulatory interest in PFAS contamination in public drinking water systems at the federal and state levels, public water delivery and treatment system operators should consider following baseline "good compliance hygiene" practices:

- **Always look ahead.** Continue working to maintain compliance with current regulations and obligations. Right now, this requires an understanding of state regulations where you operate (as states are out in front of federal standards), bearing in mind that USEPA is promulgating new regulations and federal standards that will become applicable in the near term. Consider whether your drinking water system currently measures PFAS contamination at levels that would exceed USEPA's proposed standards under the SDWA.
- **Know your neighbor.** Take every opportunity to build goodwill in the communities where you operate. Attend community meetings and consider investing in projects that benefit your customers and neighbors.
- **Befriend your regulators/scrub your data.** Engage local, state, and federal regulators before they initiate enforcement actions—nurture these relationships. And be attentive to all data posted online or mailed to the community about constituents/contaminants in public water systems. Double-check this information if it's gathered and published by a governmental regulator.
- **Always be auditing.** Consider developing an internal audit process, in addition to what's required by state and federal regulators, as a compliance check. In the event of

an enforcement action, a robust internal auditing program signals a healthy compliance system. Implementing PFAS-specific monitoring systems to evaluate these chemical compounds will also assist with understanding forward-looking compliance obligations.

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AWWA Resources

- Monitoring UCMR Compounds in Drinking Water System Components and Treatment Chemicals. Foster, K.G. & Greiner, P., 2019. *Journal AWWA,* 111:3:25. https://doi.org/10.1002/awwa.1250.
- Per- and Polyfluoroalkyl Substances (PFAS): Summary of State Regulation to Protect Drinking Water. https://www.awwa.org/Portals/0/AWWA/Government/SummaryofStateRegulationtoProtectDrinkingWater.pdf
- Recently Detected Drinking Water Contaminants: GenX and Other Per- and Polyfluoroalkyl Ether Acids. Hopkins, Z.R.; Sun, M.; DeWitt, J.C.; & Knappe, D.R.U., 2018. *Journal AWWA,* 110:7:13. https://doi.org/10.1002/awwa.1073.

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