ADDRESSING THE PFAS CHALLENGE

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Hardly a week passed in 2019 without a news article or regulatory announcement regarding PFAS—per-and polyfluoroalkyl substances—in drinking water, wastewater or biosolids. This class of emerging contaminants has entered the public psyche and has garnered political attention in Washington more so than many prior environmental concerns in the U.S. and across the globe, perhaps due to the uncertainty surrounding PFAS sources, regulations and treatment. Because of their persistence and pervasiveness, PFAS present challenges for larger utilities and small utilities alike.

What Are PFAS?

PFAS are a large and complex class of anthropogenic compounds that have been used widely in industrial and consumer products since the 1940s. This class of compounds is composed of different families that have varying physical and chemical properties (Buck et al., 2011). Due to their unique and diverse chemical properties, PFAS were incorporated into components of inks, varnishes, waxes, firefighting foams, metal plating, cleaning solutions, coating formulations, lubricants, water and oil repellents, paper, and textiles (Paul et al., 2009).

While some PFAS undergo partial biotic or abiotic degradation, the perfluorinated compounds do not demonstrate susceptibility to degradation and are highly persistent in the environment (Wang et al., 2017). As a result, these synthetic chemicals are expected to be detected for decades in the environment and are spreading to areas far from their original release. Studies have also shown that some PFAS are bioaccumulative and toxic, and may pose a risk to both human and environmental health.

Challenges for Public Clean Water Utilities

While wastewater treatment plants (WWTPs) are not themselves the source of PFAS, they serve as a natural point of collection from industrial, commercial and domestic sources, and could be key for control and potential removal from the water cycle. PFAS use in consumer products and at manufacturing and industrial facilities, in conjunction with resistance to degradation, has resulted in the presence of PFAS in the collection system and at WWTPs both large and small.

Effluents discharged from wastewater treatment plants and biosolids applied to land for beneficial reuse have been identified as two of the main known PFAS release pathways into the environment by the Interstate Technology and Regulatory Council (ITRC) (ITRC, 2017). This puts WWTPs at the heart of managing and mitigating the environmental spread of PFAS — they can act as key participants in protecting both human and environmental health. For smaller utilities with more limited resources, addressing these chemicals could prove particularly challenging.

As is often the case with PFAS, while the concept of evaluating the occurrence and fate seems simple, there are many unanticipated factors that may impact both. For example, the occurrence of PFAS in WWTPs may be affected by:

- geographical location;
- rural or urban location;
- number and type of industrial dischargers within the sewershed or through direct trucked-in wastewater receiving stations at WWTPs; and
- past or ongoing PFAS releases into the groundwater or atmosphere that enter the WWTP during wet weather events or high ground water period via inflow and infiltration.

Providing Utility Resources on PFAS

AECOM has been a thought leader in PFAS evaluations, drawing on nearly 20 years of experience with these chemicals. AECOM is also at the forefront of building an understanding of PFAS occurrence and behavior, which promises to be a concern not only for the clean water sector but for environmental protection at large.

To date, limited data exist on the occurrence and fate of PFAS at WWTPs across the United States, and less is known about the effect that wastewater and biosolids treatment processes may have on the transformations, destruction or removal of PFAS to mitigate its release into the environment. So there is still much to be learned to inform the development of PFAS regulations.

To this end, AECOM recently supported a partner undertaking a statewide evaluation of the occurrence and fate of PFAS at many WWTPs. The study examined the occurrence and concentration of PFAS in the influent, effluent and treated biosolids. The occurrence was also linked back to the type of PFAS source industries and facilities in the sewershed through a comprehensive

examination of the industries and their specific PFAS discharges.

NACWA is working to inform its utility members of all sizes on PFAS issues, including via the November 2019 publication "*A Clean Water Utility's Guide to Considering Source Identification, Pretreatment, and Sampling Protocols for PFAS.*" This document highlights — despite the regulatory uncertainty — proactive efforts that can be made in managing sources of PFAS that make their way to utilities.

With care, planning and focused management, PFAS-containing inputs from industrial and military sources may be managed prior to treatment.

NACWA's document also highlights less controllable sources, such as small volume, light industry and domestic sources that may intermittently enter a treatment system.

PFAS will be a continued challenge for clean water utilities in the years to come. But the main takeaway from the work of NACWA and AECOM is that knowledge, in the form of input assessment and/or sampling data results, is an important tool for utilities of all sizes to address PFAS concerns.

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VISIT:

nacwa.org/pfas

to access the document and other resources.

A Clean Water Utility's Guide to Considering Source Identification, Pretreatment, and Sampling Protocols for PFAS

Learn more about how to identify industrial PFAS sources, what pretreatment steps utilities can take, what challenges utilities may encounter with sampling, and how to communicate PFAS issues with the public.