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New Jersey Clean Water Council

Jan. 21, 2021 Public Hearing on PFAS Chemicals – Comments from The Association of Environmental Authorities (AEA)

The Association of Environmental Authorities (AEA) thanks the Clean Water Council (CWC) for addressing its annual public hearing to this important topic.

AEA is a trade association representing public local, regional and county authorities that provide water, wastewater and solid waste service in New Jersey. Our 85 member authorities and municipal utilities provide water, wastewater and/or solid waste service in every county. Most of our State's residents and business receive one or more of these services from an AEA member utility.

As stewards of the environment and public health, wastewater utilities are already taking steps every day to protect public health. AEA members share the concerns about PFAS chemicals. The wastewater sector understands that the presence of PFAS compounds in the environment is a matter that must be addressed. AEA is encouraged by the growing body of information available to support prudent, practical management decisions.

When two entities work in partnership with each other, the results can be much more acceptable and implementable. AEA members have frequently and successfully worked with the New Jersey Department of Environmental Protection (DEP)in the past.There are examples of AEA members working in partnership with DEP to address water quality issues. Two of these examples have occurred in the Passaic River Basin.

The first example is the reduction of phosphorus in the river, which is a means of controlling the production of algae and other nuisance plant life that adversely affects water quality:

- Initially, extremely low phosphorus limits were proposed as the one-size-fits-all solution. Implementation of this could have resulted in estimated costs to the public in the hundreds of millions of dollars statewide.
- After many years of dispute and legal challenges, the DEP and the wastewater treatment plant (WWTP) dischargers in the Passaic Basin agreed to do the science necessary to properly determine the required level of phosphorus limits.

Together they shared the costs of conducting a water quality study to develop and utilize a mathematical model for the basin.

- The results of this effort provided a scientifically supported Total Mass Daily Loading (TMDL) for phosphorus in the freshwater Passaic River Basin and from that TMDL, discharge permit limits for phosphorus were determined and are being implemented.

The second example is the reduction of nitrate in the Passaic River Basin to protect for drinking water standards:

- While the standards for nitrate in the basin have not been exceeded, it was recognized that additional efforts to control nitrate were necessary and should be proactively evaluated and addressed.
- Working in cooperation with DEP, several dischargers in the basin were able to make voluntary improvements and maximize the best use of their treatment facilities to reduce the amount of nitrate being discharged.
- As a result, nitrate concentrations in Passaic are substantially down.
- In addition, a larger group of dischargers (including the above-mentioned nitrate reducers) have supported the initial adaption of the mathematical model used for phosphorus, to be utilized to estimate the nitrate levels.

These examples illustrate that years of little progress can be replaced by months of cooperation and acceptable science-based solutions. DEP and the WWTPsare funded by the public and share the same mission: protecting the environment. By continuing the cooperation initiated by CWC through its January 21st hearing, we can use our collective knowledge and abilities to formulate a coherent regulatory scheme that will address the difficult issues posed by PFAS and achieve our common goal of serving the public.

With that pledge to work with the DEP in mind, AEA offers the following considerations and recommendations to CWC and DEP as we move forward with PFAS regulation:

CONSIDERATIONS

- Although WWTPs receive sewage that contain PFAS chemicals, they were not designed for removing those chemicals as virtually all WWTPs were constructed before there was awareness about the ubiquitous nature of PFAS chemicals and their potential for harming human health. Accordingly, most WWTPs rely upon conventional treatment processes, which generally include: preliminary physical treatment (screenings/grit removal); primary sedimentation; biological activated sludge; coagulation; flocculation; secondary sedimentation; filtration; and disinfection. These conventional treatment processes show little, if any, effectiveness for removal of PFAS in an appreciable measure.Considering that there are several thousand PFAS chemicals, adapting

currently used technologies and/or determining new technologies that can be used to treat PFAS is an extremely complex calculation.

- WWTPs produce residuals—biosolids—from their treatment processes. The biosolids produced by conventional treatment will also contain PFAS, and there are limited disposal alternatives available. Accordingly, consideration must be given to the financial and environmental impacts related to such disposal. An October 2020 study conducted by CDM Smith in collaboration with NACWA, WEF, and NEBRA indicated that the impact of PFAS on biosolids management has significantly increased disposal costs. The study found that disposal practices where regulation has occurred in the United States has diverted biosolids from beneficial re-use to landfill disposal. (Please see the addendum with information related to biosolids.)

- Source control is the solution—it works. Controlling and reducing the prevalence of PFAS chemicals that are of known significant concern must, as a matter of first course, be addressed by reducing and/or preventing their use in commerce and/or release to the environment. We must find safer alternatives for heavy use areas such as firefighting training sites. So long as PFAS are elements of products used in our everyday lives, and background levels resulting from decades of manufacturing and use persist, these chemicals will continue to be found in "receiver" streams.Those who manufacture PFAS chemicals should be responsible for any needed remediation and the ultimate elimination of PFAS from uses that pose a threat to the environment.

- PFOS and PFOA— two of the most common chemicals—were phased out of production in the US in 2002 and 2015 respectively but are still found in imported products. PFOA and PFOS are found in every American person's blood stream in the parts per billion range, though those concentrations have decreased by 70% for PFOA and 84% for PFOS between 1999 and 2014, which coincides with the end of the production and phase out of PFOA and PFOS in the United States.[1]

- According to NACWA and other industry groups, the three most viable technologies for PFAS/PFOA removal from wastewater effluent are thermal treatment, reverse osmosis and ion exchange. These applications are all very expensive and the effectiveness varies with the type of PFAS chemicals being treated. This is why it is so important to get this right.

- AEA is not aware of any large-scale WWTPs in the United States (or internationally) that have been modified solely to address PFAS. However, drinking water treatment facilities have implemented processes that are known to be effective for PFAS removal.In practice, these generally have included:

    1. Activated Carbon (GAC or PAC)
    2. Anion Exchange, and

3. Reverse Osmosis (membranes).Nanofiltration membranes are also believed to be effective.

In New Jersey, there are approximately 10 water treatment facilities that are designed to remove PFAS. There are also several drinking water facilities that are in planning, design and construction. These facilities rely upon activated carbon or anion exchange. The implementation of PFAS removal at drinking water facilities is similar throughout the U.S.We are aware of one (1) drinking water facility that is planning to install Reverse Osmosis (R/O) to address PFAS.Where R/O has been selected, there are usually other factors in addition to PFAS that have driven the decision to select that technology.

- The processes implemented at drinking water facilities to remove PFAS are potentially available for use in WWTPs, but would be technologically difficult and extremely expensive to use. The challenges in applying the three primary PFAS removal processes at wastewater facilities is due to a number of factors:

    a. Wastewater contains compounds such as total organic carbon and other constituents that will preferentially consume available sorption sites on activated carbon or (an)Ion exchange media.
    b. Pre-treatment and a very large treatment system will be required to remove PFAS to trace levels with these technologies.
    c. Robust pretreatment will also be necessary for reverse osmosis technology and will be difficult to accomplish at the scale required for wastewater treatment facilities.Reverse osmosis systems are also complexand energy-intensive, requiring high operator attention compared with conventional processes.
    d. Pilot or demonstration testing is clearly necessary to confirm process performance, establish design criteria (media exhaustion rate/breakthrough/EBCT), and identify fouling mechanisms.
    e. In many cases, facility hydraulic profiles will need to be modified and will require intermediate pumping.
    f. Spent media or brine disposal will be very expensive.Improper disposal methods could increase liability risks for public utilities.

    Work being done by the WEF and academia indicates that there are other emerging technologies that could be effective for PFAS removal.However, these are either experimental or not yet commercially available.

- There is no EPA-approved analytical testing method for PFAS or the suite of PFAS precursors in environmental media other than drinking water.This is why AEA objected to imposing effluent limits on groundwater dischargers. We respectfully disagreed with DEP when its PFAS/PFOA regulations were developed with the assumption that testing

wastewater could be done accurately and effectively. EPA's designation of method of analysis is expected within a relatively short time and will create clarity and uniformity.

RECOMMENDATIONS

Summary of AEA Recommendations:

- Drinking water monitoring under new regulations is just beginning. Allow time for the gathering and analysis of the valuable data that DW regulations will provide to help determine points of greatest concern.
- Study the approaches being used by other EPA Regions such as 1,3, 4, and 5 and let them guide NJ's approach.
- Consider having WWTPs sample as part of study. The sampling that they do can help identify hot spots and patterns.

Recommendation Details:

AEA proposes development and implementation of a PFAS cooperative minimization plans by WWTPs, in which non-domestic dischargers contributing PFAS loadings are identified. In addition, WWTPs would review their own chemicals used to ensure there are no products containing PFAS chemicals. Identifying and minimizing the use of PFAS-containing products will go a long way toward reducing loadings to our facilities and State waters.

WWTPs would engage non-domestic dischargers to minimize PFAS loadings and work with them to identify opportunities to substitute non-PFAS-bearing inputs to their processes or to convert to closed-loop production. This approach could be enhanced (potentially through the imposition of additional pretreatment requirements) where impacts to a downstream CWS are identified and where upstream source reduction is more appropriate than adding downstream PFAS treatment at the CWS. Key components of such minimization plans will include:

- Non-domestic user surveys followed up by reporting on significant use/contribution of PFAS chemicals.
- Verification sampling of non-domestic users for PFAS chemicals including landfill leachate and hauled wastes.
- Sampling of key trunk sewers in WWTP collection systems, on a targeted and non-targeted basis, where PFAS levels of interest have been identified and to characterize background levels of PFAS chemicals from domestic users.
- Reviews of chemicals used in collection system management and wastewater treatment functions.
- Other facility-specific measures.

Several states that conducted statewide sampling for PFAS chemicals in raw source water (surface and ground) for CWSs have seen that a relatively small percentage of CWSs have

PFAS issues of concern. The most common response has been to add PFAS treatment at the CWS while seeking to reduce upstream loadings to raw water supplies. In New Jersey, the number of CWSs impacted may be higher due to the State's unprecedented adoption of strict MCLs for PFOA, PFOS, and PFNA.The statewide impact of these MCLs will not be clear until the CWSs complete their initial PFAS monitoring. Ideally, the State should proceed by carefully reviewing the results of all four quarters of sampling, then by reviewing the results of implementation of any additional water treatment processes to remove PFOA/PFOS. Also, in order would be TMDL studies to determine the extent of the amount of PFOS/PFOA in given water bodies and the amounts of these compounds in the WWTP discharges.We also note that identifying non-domestic users whose flow goes through a municipal collection system to a WWTP managed regionally may be a more complex task than in cases where the non-domestic user is a direct customer of the WWTP.

In other states, treatment options and results are facility-specific and dependent on the PFAS chemical(s) of concern because some treatment technologies are better at removing long-chain PFAS chemicals while others better address short-chain. Treatment efficacy varies from one facility to the next for still-unknown reasons. It is prudent to undertake careful pilot testing before huge investments that may or may not be effective are made. It is best to take a comprehensive approach in selecting treatment technology before installing treatment to deal with MCL-related concerns for only PFOA, PFOS or PFNA.All PFAS chemicals for which we have analytical methods (whether approved or not) should be evaluated.A treatment approach can then be selected based on the range of PFAS chemicals of concern at play and also to address other emerging contaminants such as 1,4 Dioxane.

After sampling, the following PFAS-related concerns would be expected:

- **Groundwater**.The solutions for a CWS that uses groundwater as a raw-water source and has high PFAS levels are limited to switching to an alternate supply or adding treatment to remove the PFAS chemicals.
- **Surface Water**.Surface water with PFAS background levels of concern should be attributable to:
    - Direct discharge industry
    - WWTP
    - Hot spot (airport, military base, etc.) – whether due to legacy activities or ongoing
    - Unknown

In the case of upstream direct discharge, the industry could reduce its loadings so the downstream CWSs do not exceed the MCLs.If product substitution is not a solution, additional treatment (such as granulated activated carbon) may be required. If the source is an upstream WWTP, a tailored PFAS minimization plan should address the concern. If the source is a hot spot such as an airport or military base, then the typical approach has been to install PFAS removal technology at the CWS unless there is a way to stop the ongoing PFAS loadings from

the hot spot. If the source is unknown and the surface raw water supply has PFAS levels of concern, then typically the CWS will install PFAS removal technology.

Addendum

PFAS, Biosolid and Air

Impacts of PFAS regulation on sludge/biosolids disposal is not limited to groundwater and surface waters, but also to the air environment. While we recognize that this is not overseen by the Division of Water Resources and may not be directly relevant to the Clean Water Council, we have included this addendum to our comments because PFAS air emissions regulation would impact WWTPs with sludge incinerators, dryers, flares, etc. We recommend the DEP look at the totality of environmental impacts, and solutions, as it considers PFAS. For the sake of New Jersey ratepayers, it is important to spend money costeffectively. Solid waste incinerators would be of concern. Currently, most of the information available in this area is theoretical, based on stoichiometry or on bench-scale tests. AEA is aware of research at two SSIs which have performed full-scale testing, but with very little data was generated. Air emission limits for PFAS/PFOSwould impact six (6) WWTPs with SSIs:

- Atlantic County UA
- Bayshore RSA
- Gloucester CUA
- Northwest Bergen CUA
- SRVSA
- Stony Brook RSA