North Carolina DEQ
Action Strategy for PFAS

June 7, 2022



NORTH CAROLINA
Department of Environmental Quality

Executive Summary

North Carolina is working aggressively to address the impacts of PFAS, or per- and poly-fluoroalkyl substances, in our state. PFAS compounds are widely used in commercial and consumer products such as food packaging, water- and stain-repellent fabrics, nonstick products and firefighting foams. PFAS are known as "forever chemicals" because they don't break down in the environment. PFAS have been linked to health effects in humans and animals.

North Carolina has been a national leader on PFAS since 2017 when the public became aware that GenX, a PFAS produced at the Chemours Fayetteville Works Facility, had been discovered in the Cape Fear River. Since then Chemours-related compounds have been found in an expanding radius around the facility and as far downstream as New Hanover and Brunswick Counties.

As a result of the contamination from Chemours, North Carolina has been aggressively moving forward to manage the risks of PFAS. North Carolina researchers have been at the forefront of the scientific analysis and understanding of these compounds. In the absence of federal standards or guidance, North Carolina took steps to address contamination from the Chemours Fayetteville Works Facility. Action by the North Carolina Department of Environmental Quality under a court-approved Consent Order stopped the ongoing wastewater discharges of GenX and related compounds from plant operations and nearly eliminated the air emissions of these compounds from the plant. The North Carolina Department of Health and Human Services developed a state provisional health goal for GenX based on the best available science at the time. Residents with impacted drinking water wells have received alternate water supplies to reduce their exposure to PFAS contamination. DEQ required Chemours to take a series of actions to reduce PFAS entering the river and to address groundwater contamination

leaving the site. Work is currently underway to provide relief to downstream communities impacted by the facility's contamination.

While the spotlight on PFAS in North Carolina arose through GenX and Chemours-related compounds, the issue of PFAS is larger than one compound or one company. DEQ has done significant work responding to PFAS contamination in specific sites, including those related to aqueous film forming foam or AFFF use. However, without federal water quality standards for PFAS compounds, DEQ sees a need for a larger strategy to address these compounds in a comprehensive way. In 2021, the EPA announced a roadmap to address PFAS nationwide with actions that complement and strengthen the state's efforts to protect our residents and resources.

Each day what we know about PFAS expands and further informs our actions. DEQ is taking actions that specifically target the compounds found in North Carolina which affect residents of our state. This Strategy outlines DEQ's current and planned work to determine the extent of existing PFAS contamination, protect our residents and drinking water supplies and prevent future contamination.

DEQ prioritizes three key action areas:

PROTECTING COMMUNITIES

We will continue to identify and notify those who may be at risk of exposure, investigate the human health risks and expand the base of scientific knowledge for North Carolina-specific PFAS compounds.

PROTECTING DRINKING WATER

We will work to minimize future releases of PFAS to drinking water sources by setting regulatory standards and driving actions to prevent future PFAS pollution.

CLEANING UP EXISTING CONTAMINATION

We will continue to hold responsible parties accountable for remediating known PFAS contamination sites affecting drinking water supplies and other receptors to protect human health and the environment.

The Impacts of PFAS in North Carolina

PFAS compounds are commonly used in industrial processes and found in a wide range of consumer goods. As a result, these compounds are present in household and industrial waste. In addition, industrial PFAS air emissions can deposit these compounds into surface water or soil and eventually reach groundwater. Regardless of how they enter the environment, the chemical structure of PFAS prevent them from breaking down easily, which is why they are known as "forever chemicals." They will continue to cycle through our environment indefinitely unless they are intercepted and removed through treatment.

Most Americans have been exposed to PFAS. Ingestion through drinking water has been identified by scientists as the primary pathway for PFAS exposure in humans. Standard municipal drinking water treatment systems are not built to filter out PFAS and some PFAS can accumulate in the human body. Scientific studies have shown that exposure to certain levels of PFAS have been linked to reproductive effects such as decreased fertility or increased high blood pressure in pregnant women; developmental effects or delays in children, including low birth weight, accelerated puberty, bone variations, or behavioral changes; increased risk of some cancers; reduced ability of the body's immune system to fight infections, including reduced vaccine response; interference with the body's natural hormones; and increased cholesterol levels and/or risk of obesity.[1]

A variety of PFAS have been detected in North Carolina's drinking water sources, ground water, surface water, soil, and aquatic life. However, current lab methods for measuring concentrations of PFAS are complex and limited in their ability to measure the wide range of PFAS that may be present. In addition, more data are needed on toxicity, exposure levels and health effects. DEQ continues to work with NCDHHS and academic partners to understand human exposures and health impacts. DEQ supports additional research in the public and private sector to better understand and reduce the risks from the impacts of PFAS contamination on the residents of North Carolina.

[1] Source https://www.epa.gov/pfas/our-current-understanding-human-health-and-environmental-risks-pfas

DEQ Actions to Date

In addition to work related to the Chemours site, DEQ's work on PFAS includes:

- Review of PFAS compounds and exposure pathways present in North Carolina;
- Review of PFAS scientific literature, methods of PFAS grouping and reference doses with the Secretaries' Science Advisory Board;
- Analysis of most prevalent PFAS compounds in multiple media;
- Development of analytical methods and toxicology protocols;
- Evaluation of current sites where potential PFAS impacts may exist, including sites involving AFFF use;
- Evaluation of emerging compounds in landfill leachate at nine municipal facilities and potential impacts to water treatment facilities;
- Study of PFAS in effluent of Publicly Owned Treatment Works and Industrial Dischargers;
- Evaluation of two drinking water filtration systems for residential use;
- Establishment and operation of statewide air deposition monitoring network;
- Statewide survey of PFAS foam occurrence, development of sampling and analytical methods, and design of statewide sampling study;
- Private well sampling, groundwater well testing within the ambient monitoring network and surface water monitoring for PFAS;
- Monitoring and disclosure requirements in National Pollutant Discharge Elimination System (NPDES) permits; and
- Planning for fish tissue collection and analysis to better understand PFAS accumulation.

Federal Approach

EPA has developed and is implementing a multi-pronged PFAS Strategic Roadmap to address PFAS at the national level. Among the actions expected in 2022 are the proposed rule to establish a national primary drinking water regulation for PFOA and PFOS, the release of a national Health Advisory level for GenX and updates to methods for measuring PFAS. North Carolina will benefit from this work at the federal level but will also need to enact its own measures to fully address the PFAS chemicals that are most commonly found in our state.

Other Efforts

A variety of studies and investigations are underway at state agencies, including NC DHHS and the state Department of Justice, as well at the North Carolina Collaboratory and academic institutions around the state.

This plan is focused on DEQ's strategy as a whole and does not include every effort completed or underway in North Carolina.

NORTH CAROLINA DEQ ACTION STRATEGY FOR PFAS

To protect residents from future exposures and reduce environmental pollution, DEQ has developed a comprehensive strategy to address PFAS contamination in a proactive, systematic way. This Strategy includes actions already underway across the Department as well as planned future actions.

PROTECTING COMMUNITIES

We will continue to identify and notify those who may be at risk of exposure, study the human health risks and expand the base of scientific knowledge for North Carolina-specific PFAS compounds.

PROTECTING DRINKING WATER

We will work to minimize future releases of PFAS by setting regulatory standards and encouraging actions to prevent future PFAS pollution.

CLEANING UP EXISTING CONTAMINATION

We will continue to require remediation of known PFAS contamination sites affecting drinking water supplies and other receptors to protect human health and the environment.

Protecting Communities

DEQ is prioritizing actions to protect the health of North Carolinians. In order to do this, we will increase our understanding of how people are exposed to PFAS compounds and the resulting health effects.

- DEQ is prioritizing the testing of public drinking water systems and private drinking water wells, with an initial focus on high-risk areas. We will prioritize future action to protect these water supplies based upon the number of people impacted, concentration of PFAS in the drinking water, and the impacts to vulnerable populations and disadvantaged communities.
  - *In progress*

- DEQ is prioritizing the reporting of PFAS emissions or discharges to air, surface water, or groundwater from priority locations including but not limited to industrial sites, municipal wastewater treatment plants, landfills and sites with firefighting foam use. This reporting helps the state learn more about the potential sources of PFAS impacting communities.
  - *In progress*

- DEQ and DHHS are already working to develop a list of PFAS most frequently detected in North Carolina (PFAS Priority List) with input from the Secretaries' Science Advisory Board (SAB). The Board includes 16 experts in toxicology, public health, ecology, engineering and other related fields who collaborate with DEQ and DHHS to identify contaminants of concern and determine which contaminants should be examined further to develop reference dose values and human health risk factors.
  - *In progress*

- With guidance from the SAB, DEQ will evaluate existing scientific literature on PFAS risks and health effects and work with partners at DHHS, in federal government and the scientific community to identify the additional data needed to support regulatory standards development.
  - *Anticipated start Summer 2022*

- As additional site monitoring and new scientific data become available at the federal and state levels, DEQ will update the PFAS priority list for North Carolina and related health assessment information.
  - *Ongoing*

Protecting Drinking Water

To protect residents from future exposures and reduce environmental pollution, North Carolina will use the best available science to establish standards to address contaminated drinking water, which is the primary source of human exposure. DEQ will use available research to develop science-based regulatory standards, incorporate those standards into permitting and provide a non-regulatory pathway for permittees who want to reduce PFAS voluntarily.

Proposing Regulatory Standards

- DEQ will propose Groundwater Standards for PFAS. An estimated 2.4 million people in North Carolina depend on groundwater for their primary drinking water source.[2] State groundwater standards will protect private drinking water wells and set targets for cleanup of contaminated sites. To start, using the most current reference doses released by the EPA, DEQ will propose standards for PFOA, PFOS, GenX, PFBS and PFBA to the Environmental Management Commission (EMC) to initiate rulemaking.
  - *Anticipated start Summer/Fall 2022*

- DEQ will propose Surface Water Standards for PFAS. Surface water includes streams, rivers and lakes and can serve as drinking water supply to some communities. Setting standards for PFAS in surface water protects drinking water sources, as well as recreational uses and the aquatic life and wildlife that depend on this natural resource. DEQ will work with the SAB and the scientific community to identify bioaccumulation or toxicity factors that are needed to develop surface water standards for PFAS. DEQ will propose standards for PFOA and for other compounds as data becomes available.
  - *Anticipated start Fall/Winter 2022-2023*

- DEQ will propose Drinking Water Standards for PFAS. Public water utilities rely on standards, called Maximum Contaminant Levels or MCLs, to determine the level of treatment needed to provide clean drinking water to their customers. DEQ will propose MCLs for priority PFAS in drinking water for the protection of human health, while also being technologically and economically feasible.
  - *Anticipated start Fall/Winter 2022-2023*

[2] https://epi.dph.ncdhhs.gov/oee/wellwater/figures.html

Implementing Standards

- DEQ will use approved standards to modify environmental permits with enforceable limits of PFAS discharges. Standards-based permit limits reduce the PFAS compounds entering the environment, give the industrial community certainty and set clear targets for PFAS reductions.

- DEQ will use approved standards to ensure that drinking water is treated to a level that is protective of human health. Where required, DEQ will work with utilities to identify, deploy, and monitor drinking water treatment systems that are technologically and economically feasible.

The regulatory approach of enforceable standards should be paired with additional non-regulatory actions. Voluntary actions by permittees to reduce PFAS emissions and discharges can have significant positive effects and address impacts on public health even before the standards process is complete. DEQ will be encouraging permittees to monitor and voluntarily disclose PFAS information in their products, processes, stacks, and outfalls and take early action to reduce or eliminate PFAS entering the environment. DEQ will provide technical assistance to early action takers to help reduce or eliminate PFAS discharges prior to standard implementation.

- DEQ will support initiatives that focus on pollution prevention and minimizing future releases of PFAS. Examples include assistance related to effective sampling and monitoring techniques, technology feasibility assessments, and cost evaluations. DEQ will also promote best management practices for storage, use, and safe disposal, facilitate industry training workshops, identify PFAS-free alternatives and assist with site specific source reduction information, treatment and cleanup methods.
  - *Anticipated Summer/Fall 2022*

- DEQ will explore creating funding priority for systems facing public health issues and advocate for support at the state and national level. DEQ will also provide information to public water systems on access to NC Drinking Water State Revolving Fund to finance the design and construction of treatment system and infrastructure improvements.
  - *Anticipated Fall 2022*

Cleaning Up Existing Contamination

DEQ will continue to focus on remediation to address known sites of PFAS contamination, prioritizing those that impact communities. DEQ will set remediation goals for sites with PFAS contamination and ensure cleanup results in health-protective outcomes. DEQ will also continue to hold polluters accountable and require responsible parties to clean up PFAS contamination. The agency will use the State's ability to recover costs from responsible parties when possible.

- *Ongoing*

Conclusion

DEQ is committed to protecting the residents of North Carolina by addressing the threat of PFAS contamination. DEQ will continue to take action to limit human exposures, protect drinking water supplies and expand the scientific understanding of PFAS compounds in North Carolina. The Department will continue to evaluate the needs of our residents and take into account the best available science to update and adjust the actions in this plan.

Since 2017, DEQ has used existing resources to address the evolving issue of PFAS in our state. The Department will continue to advocate for additional funding to support staffing, analysis, and rule making, as needed, to best serve the people of North Carolina.