West Virginia University
Bridge Initiative for Science and Technology Policy, Leadership, and Communications

Legislative Science and Technology Note

PFAS and the Health of West Virginians

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Per- and polyfluoroalkyl substances (PFAS) are a group of synthetic chemicals that have been used to make coatings that resist heat, oil, stains, and water since the 1940s. PFAS take hundreds of years to break down in the environment and can build up in the bodies of animals and humans, leading to concerns about potential health impacts. This Science and Technology Note discusses the known health risks of PFAS exposure, recent PFAS regulations in West Virginia, and policy options to address potential PFAS exposure in West Virginians.

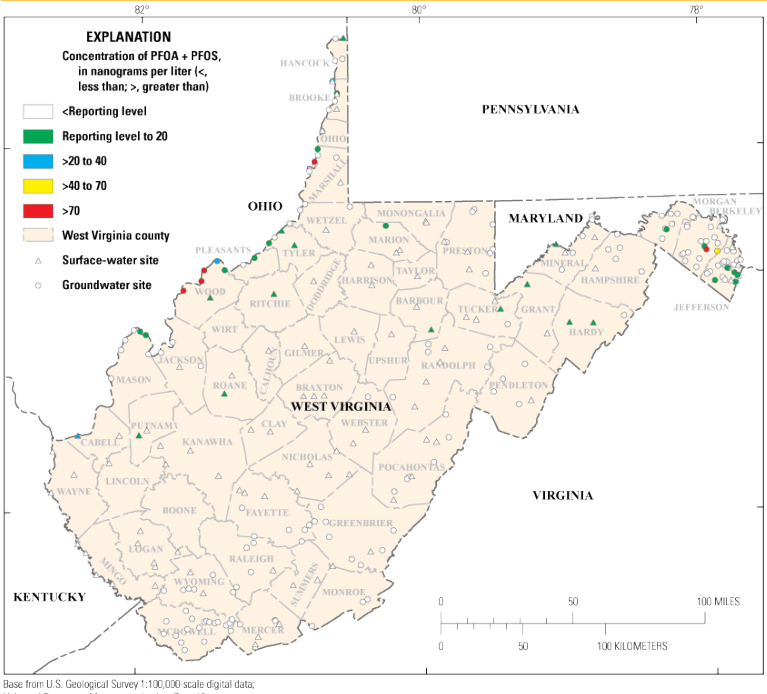
Research Highlights

- Of 279 public water systems in West Virginia, 19 have been found to have high levels of PFAS in processed drinking water. Private wells were not sampled as part of this study.
- PFAS, also known as “forever chemicals”, can build up in the body and have been linked to kidney cancer, testicular cancer, thyroid disease, high cholesterol, ulcerative colitis, and preeclampsia.
- Policy options to identify PFAS exposure in West Virginians include monitoring of private wells to enable installation of filtration systems and biomonitoring of fish populations to inform “Do Not Eat” advisories.

PFAS in West Virginia

The DuPont Washington Works manufacturing plant just outside of Parkersburg, West Virginia was one of the first large-scale PFAS manufacturing centers in the United States, beginning operations in 1951. In 1999, a local farmer filed the first PFAS-related lawsuit following the loss of numerous cows to stillbirth, birth defects, and tumors upon drinking water downstream of an unlined PFOA (a type of PFAS) landfill. This lawsuit led to the discovery of DuPont’s internal studies of the biological impact of PFAS in rats, which found birth defects, liver, pancreas, and testicular cancer. A class action lawsuit representing West Virginians exposed to PFAS was filed in 2001 and led to a settlement with DuPont for over $300 million.

An independent PFAS science panel was formed as a result of the settlement in 2005 to investigate the health effects of exposure, and their 2012 report concluded that PFOA exposure in drinking water is linked to kidney cancer, testicular cancer, thyroid disease, high cholesterol, ulcerative colitis, and preeclampsia. Following this, the EPA set a safety limit to 4 parts per trillion (ppt), much lower than DuPont’s previous internal safety limit of 1000ppt. In a 2022 study, the West Virginia Department of Environmental Protection (WVDEP) and US Geological Service found that 130 of 279 public water systems had detectable PFAS in raw water, 27 had detectable levels of PFAS in fully processed drinking water, and 19 of those systems have levels above the EPA’s regulatory standards.

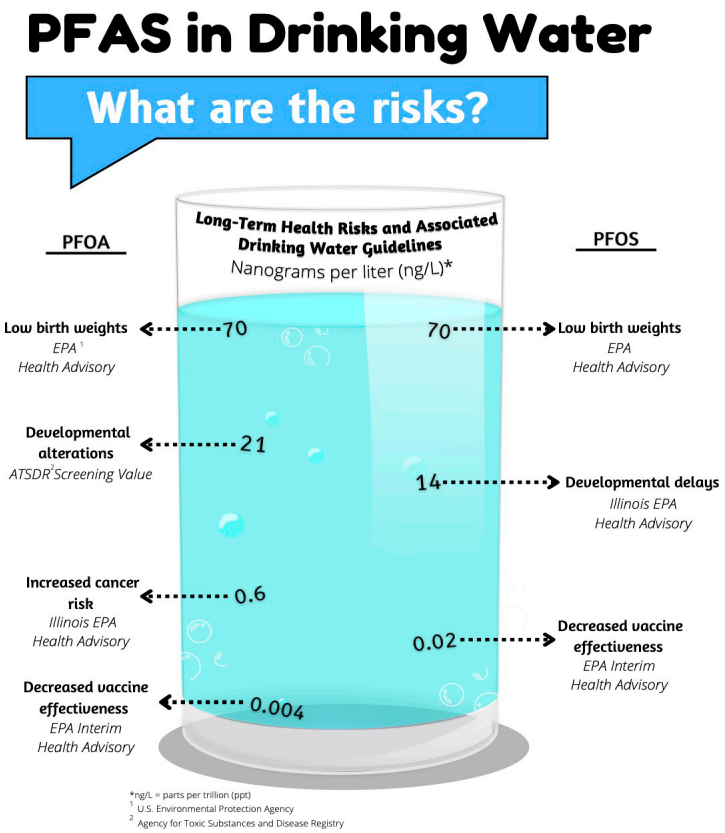


Base from U.S. Geological Survey 1:100,000 scale digital data; Universal Transverse Mercator projection, Zone 18; North American Datum of 1983

Source: McAdoo et al., 2022. Nanograms per liter (ng/L) and parts per trillion (ppt) are equivalent units.

PFAS Legislation in West Virginia

The PFAS Protection Act was signed into law by Governor Justice in 2023, improving PFAS reporting requirements and requiring the WVDEP to identify and address PFAS in water sources. Additionally, the Bipartisan Infrastructure Law allocated $18.9 million over 2 years to mitigate PFAS in West Virginia’s water. The money will go toward research, water treatment, and/or managing water systems.



Source: Illinois Department of Public Health.
PFOA and PFOS are two common types of PFAS found in drinking water. Additionally, nanograms per liter (ng/L) and parts per trillion (ppt) are equivalent units.

Meeting New EPA Guidelines for PFAS

On April 10, 2024, the Environmental Protection Agency (EPA) issued the final drinking water regulations for PFAS levels. The Maximum Contaminant Levels (MCLs) range from 4-10 parts per trillion (ppt) for 5 different PFAS. Along with releasing these enforceable levels, the EPA rule requires PFAS reports from water systems by 2027 and implementation of PFAS mitigation plans to address high levels by 2029. With the WVDEP study completed, West Virginia is already ahead of this goal. The next step in this process includes compiling large scale mitigation plans, which may be achieved through carbon filtration, reverse osmosis systems, or nanofiltration at community level water processing facilities.

PFAS Regulation in West Virginia and Other Appalachian States

As of 2007, 23% of West Virginians relied on private wells for drinking water, compared to 15% nationally. Currently, there is no monitoring program or mitigation plans for PFAS in West Virginians' private wells, as the EPA does not regulate them and they are outside of the WVDEP's jurisdiction. However, they still may pose a health risk to West Virginians. To address similar concerns, the North Carolina legislature has allocated funds to offer PFAS testing and mitigation for private wells on a sliding scale based on household income.

Many states have also implemented biomonitoring protocols of local fish populations to create advisories for fish consumption. In West Virginia, fish populations are monitored for mercury, PCBs, dioxin, and selenium, but not PFAS. As PFAS can accumulate in tissues and get more concentrated as they go up the food chain, food can be a major source of PFAS exposure. Pennsylvania, Maryland, and North Carolina are among the 17 states with PFAS monitoring programs to issue "Do Not Eat" advisories in freshwater fish.

Possible Policy Options in West Virginia

Policy options to supplement PFAS mitigation plans include enacting similar legislation to the PFAS Treatment Assistance Program in North Carolina or offering testing or education programs for those with private wells as recommended in a West Virginia Rivers Coalition white paper. In doing so, protection from the health effects of PFAS exposure could be more equitably applied to the population regardless of citizens' water source. Individual home filtration also has the benefit of near-immediate availability, whereas fitting of community water systems takes substantial time and a large initial investment. However, once installed, these systems may have a much larger impact per dollar spent than in-home filtration systems.

Policy options to enable monitoring and advisories include adding PFAS into existing monitoring protocols and funding WVDEP and/or West Virginia Department of Natural Resources (WVDNR) monitoring programs. This would allow for effective use of state resources and provide a straight-forward method of data collection to observe PFAS levels and inform citizens.

This Science & Technology Legislative Note was written by Kensey Bergdorf-Smith, PhD, West Virginia Science & Technology Policy Fellow on behalf of West Virginia University's Bridge Initiative for Science and Technology Policy, Leadership, and Communications. The Bridge Initiative provides nonpartisan research information to members of the West Virginia Legislature upon request. This Science and Technology Legislative Note is intended for informational purposes and does not indicate support or opposition to a particular bill or policy approach. Please see https://scitechpolicy.wvu.edu/ or contact scitechpolicy@mail.wvu.edu for more information.