

Per- and Polyfluoroalkyl Substances (PFAS)

What are PFAS?

The per- and polyfluoroalkyl substances (PFAS) also known as ‘forever chemicals’ are a large group of manufactured man-made chemicals. Perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) are the two most widely studied PFAS substances. These substances are used in the manufacturing of a variety of everyday products. They have been used to make water, grease, or stain resistant products including carpets, clothing, furniture fabrics (e.g., Scotchgard™), cookware (e.g., Teflon®), food packaging, and for other industrial processes.

PFAS are a concern because they are long lasting chemicals which breakdown very slowly over time. This is due to the carbon, fluorine, and other elemental bonds in these compounds. They can enter groundwater through landfills, septic systems, and nearby industrial facilities where these substances were produced or used during manufacturing. Other potential sources of contamination include oil refineries, airfields, and locations where the chemicals were used for firefighting purposes.

What are the potential health effects of PFAS?

Research is still being conducted to better understand what the potential effects are of PFAS. However, there is evidence from research that exposure to PFOA and PFOS can cause increased cholesterol levels, low infant birth weights, effects on the immune system, cancer (PFOA), and thyroid disruption (PFOS). Additional studies on laboratory animals indicate reproductive and developmental, liver, kidney, and immunological effects. Since PFOA and PFOS have been used in an array of consumer products most people have been exposed to low levels.

On April 10, 2024, the Environmental Protection Agency (EPA) established legally enforceable Maximum Contaminant Levels (MCLs) for six PFAS in public drinking water systems. PFOA, PFOS, PFHxS, PFNA, and HFPO-DA (also known as GenX) as contaminants with individual MCLs, and PFAS mixtures containing at least two or more of PFHxS, PFNA, HFPO-DA, and PFBS using a Hazard Index MCL to account for the combined and co-occurring levels of these PFAS in drinking water. Additionally, a health-based, non-enforceable Maximum Contaminant Level Goals (MCLGs) for these PFAS has been established (see table on page 2). Some states may have recommended levels even lower than those provided by EPA. Check with your state environmental agency for more information. If your state has lower maximum levels for PFAS in drinking water, these levels supersede the EPA levels and should be used in its place. Well owners are encouraged to use these levels as a guideline when well water should be treated.

If you suspect contamination or experience illness, stop drinking or cooking with the water immediately and do not resume use until testing has proven it to be safe. Always seek the advice of your medical doctor if you have any health concerns.

Chemical	Maximum Contaminant Level Goal (MCLG)	Maximum Contaminant Level (MCL)
PFOA	0	4.0 ppt
PFOS	0	4.0 ppt
PFNA	10 ppt	10 ppt
PFHxS	10 ppt	10 ppt
HFPO-DA (GenX chemicals)	10 ppt	10 ppt
Mixture of two or more: PFNA, PFHxS, HFPO-DA, and PFBS	Hazard Index of 1*	Hazard Index of 1*

Maximum Contaminant Level Goal (MCLG): The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety and are non-enforceable public health goals.

Adapted from the Environmental Protection Agency (EPA) General Fact Sheet, "PFAS National Primary Drinking Water Regulation".

** This PFAS Hazard Index (HI) considers the different toxicities of PFNA, GenX Chemicals, PFHxS, and PFBS. For these particular PFAS, a hazard index calculation should be used to determine if the combined levels pose a potential risk and require action.*

How to Calculate Hazard Index for PFAS

The Hazard Index (HI) is made up of a sum of fractions. Each fraction compares the level of each PFAS measured in the water to the highest level determined not to have risk of health effects. Complete the following steps to calculate the HI:

1. Divide the measured concentration of Gen X by the health-based value of 10 ppt
2. Divide the measured concentration of PFBS by the health-based value of 2000 ppt
3. Divide the measured concentration of PFNA by the health-based value of 10 ppt
4. Divide the measured concentration of PFHxS by the health-based value of 9 ppt
5. Add the ratios from steps 1, 2, 3 and 4 together
6. If the sum is greater than 1.0, it is higher than the proposed HI MCLG and MCL.

$$\text{Hazard Index} = \left(\frac{[\text{GenX}_{\text{water}}]}{[10 \text{ ppt}]} \right) + \left(\frac{[\text{PFBS}_{\text{water}}]}{[2000 \text{ ppt}]} \right) + \left(\frac{[\text{PFNA}_{\text{water}}]}{[10 \text{ ppt}]} \right) + \left(\frac{[\text{PFHxS}_{\text{water}}]}{[9 \text{ ppt}]} \right)$$

How do I test for PFAS?

There is no taste, smell, or color associated with PFAS. The only way to know if your water is contaminated with these chemicals is to have your water tested. Testing for these chemicals can be expensive but should be performed especially in areas near industrial manufacturing facilities. Some states may have PFAS testing requirements for real estate transactions. Contact your local or state health department or the wellcare® Hotline at 888.395.1033 for a list of state-certified laboratories in your area or use our [interactive map](#).

What are the treatments for PFAS in well water?

If testing confirms that water contains any of these 6 PFAS at individual or combined levels greater than the MCLG or Hazard Index in the table on page 2, you should use water treatment to reduce these levels. Some treatment types that have shown to be effective in removal of PFAS are granular activated carbon (GAC) filtration, reverse osmosis, and ion exchange. Look for treatment systems that are certified by [NSF](#) or [Water Quality Association \(WQA\)](#). Certified water treatment professionals can help you select the right treatment. To locate a certified water treatment professional in your area, visit [WQA's website](#).

It is imperative to maintain treatment devices and change filters as specified by the manufacturer or your water treatment professional. You should also retest your water after treatment is installed and after maintenance to confirm the effectiveness of the device. When discarding media or filters, it is important to properly dispose of the material. Please contact your state's hazardous waste division for assistance with disposal.

NOTE: Boiling your water WILL NOT remove PFAS, and in fact may increase the concentration in your water.

For More Information on PFAS

Contact your state health department, local certified water treatment professional, or the wellcare® Hotline for more information on PFAS.

Center for Disease Control and Prevention. *Per- and Polyfluorinated Substances (PFAS) Factsheet*.

https://www.cdc.gov/biomonitoring/PFAS_FactSheet.html

National Institute of Environmental Health Sciences. *Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS)*.

<https://www.niehs.nih.gov/health/topics/agents/pfc/index.cfm>

NSF. *Search for NSF Certified Drinking Water Treatment Units, Water Filters*. <https://info.nsf.org/Certified/DWTU/>

U.S. Environmental Protection Agency. *Drinking Water Health Advisories for PFOA and PFOS*. <https://www.epa.gov/ground-water-and-drinking-water/drinking-water-health-advisories-pfoa-and-pfos>

U.S. Environmental Protection Agency. *Final PFAS National Primary Drinking Water Regulation*.

<https://www.epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas>

U.S. Environmental Protection Agency. *Per- and polyfluoroalkyl substances (PFAS)*. <https://www.epa.gov/pfas>

U.S. Environmental Protection Agency. *Understanding the PFAS National Primary Drinking Water Proposal*

Hazard Index. https://www.epa.gov/system/files/documents/2023-03/How%20do%20I%20calculate%20the%20Hazard%20Index_3.14.23.pdf



Information to help maintain and protect your water well system:

wellcare® is a program of the Water Systems Council (WSC). WSC is the only national organization solely focused on protecting the health and water supply of an estimated 23 million households nationwide who depend on private wells (according to the U.S. EPA).

This publication is one of more than 100 wellcare® information sheets available FREE at www.watersystemscouncil.org.

Well owners and others with questions about wells and well water can contact the wellcare® Hotline at 1-888-395-1033 or visit www.wellcarehotline.org to fill out a contact form or chat with us live!

JOIN THE WELLCARE® WELL OWNERS NETWORK!

By joining the FREE wellcare® Well Owners Network, you will receive regular information on how to maintain your well and protect your well water.

Contact us at 1-888-395-1033 or visit www.wellcarehotline.org to join!