

## What are PFAS?

Per- and polyfluoroalkyl substances (PFAS) are a group of man-made chemicals applied to some consumer products to make them waterproof, stain-resistant, or nonstick. PFAS are also used in some cosmetics, fast food packaging, and a type of firefighting foam called aqueous film forming foam (AFFF), which is used mainly on large spills of flammable liquids, such as jet fuel.

## How do PFAS get into drinking water?

PFAS enter the environment at sites where they are made, used, disposed of, or spilled. PFAS can flow with rainwater run-off and enter surface water (lakes, ponds, etc.) or seep through the soil into groundwater (underground sources of drinking water). Because PFAS are very long-lasting and are not easily broken down by sunlight or other natural processes, they may remain in water for many years.

If a public water system or your private well gets its water from a source that is contaminated with PFAS and the water is not properly treated to remove the PFAS, the chemicals may be in your drinking water. They can pass into your body when you eat food or drink liquids that contain them.

## What are the health effects of drinking water that contains PFAS?

There are many chemicals in the PFAS family, and they may cause different health effects if you are exposed to them. The health effects of PFOS, PFOA, PFHxS, PFNA, PFBA, and GenX have been more widely studied than other chemicals in the PFAS family. Some, but not all, studies in humans with PFAS exposure have shown that certain PFAS may:

**Always talk with your doctor or primary care provider if you are concerned about your health or have medical questions.**

- Affect growth, learning, and behavior of infants and children.
- Lower a woman's chance of getting pregnant.
- Interfere with the body's natural hormones.
- Increase cholesterol levels.
- Affect the immune system.
- Increase the risk of certain cancers.

Due to their widespread use and persistence, many PFAS can occur in drinking water and the environment—meaning that PFAS are often found together and in different combinations as mixtures. Scientists are still learning about the health effects of exposure to mixtures of PFAS.

Exposure to PFAS does not always mean a person will have health effects. Whether a person gets sick may depend on how long they were exposed (duration), how often they were exposed (frequency), and how much PFAS they were exposed to (dose). Personal factors like age, lifestyle, and other illnesses may also contribute to whether a person gets sick. Young children, infants, and fetuses may be at more risk of health effects.

## What levels of PFAS in drinking water are unsafe?

U.S. EPA recently finalized the National Primary Drinking Water Regulation (NPDWR) to establish legally enforceable levels, called Maximum Contaminant Levels (MCLs), for six PFAS in drinking water. U.S. EPA also established health-based, non-enforceable Maximum Contaminant Level Goals (MCLGs) for these six PFAS. Public water systems are required to meet these MCLs. Private water systems are not required to test for PFAS; however, residents are encouraged to test their wells. These levels are used as thresholds in guiding residents on health effects, ways to reduce exposures, and options for treating drinking water.

PFAS <sup>1</sup>	MCLG	MCL (Enforceable Levels)
<b>PFOA</b>	<b>Zero</b>	<b>4.0 parts per trillion (ppt) (also expressed as ng/L)</b>
<b>PFOS</b>	<b>Zero</b>	<b>4.0 ppt</b>
<b>PFHxS</b>	<b>10 ppt</b>	<b>10 ppt</b>
<b>PFNA</b>	<b>10 ppt</b>	<b>10 ppt</b>
<b>GenX</b>	<b>10 ppt</b>	<b>10 ppt</b>
<b>Mixtures containing two or more of PFHxS, PFNA, GenX, and PFBS<sup>2</sup></b>	<b>1 (unitless) Hazard Index (HI)</b>	<b>1 (unitless) HI</b>

MCL - Maximum contaminant level

MCLG - Maximum contaminant level goal

<sup>1</sup> PFOA (Perfluorooctanoic acid); PFOS (Perfluorooctane sulfonate); GenX (HFPO dimer acid); PFBS (Perfluorobutanesulfonic acid); PFHxS (Perfluorohexane sulfonic acid); and PFNA (Perfluorononanoic acid).

<sup>2</sup> PFBS health-based value used to calculate the HI is 2000 ppt. The MCLs for PFHxS, PFNA, and GenX will be used to calculate the HI.

The hazard index (HI) is a commonly used approach for assessing exposures to mixtures. A ratio called a hazard quotient (HQ) is calculated for each of the four PFAS (PFHxS, GenX, PFNA, and PFBS) by dividing the measured level of each of the four PFAS in drinking water by the MCL or a health-based value. The individual PFAS ratios (HQs) are then added together to calculate the HI. If the HI is greater than one (1.0), then the drinking water contains PFAS higher than the MCL and is a potential health risk.

## How can I test my water, and what are treatment options if PFAS are present?

### Water Testing

If you get your water from a private water system (well, spring, pond, cistern, or hauled water storage tank), you may be interested in having your water tested. Because PFAS are in many items most people use daily, including waterproof or stain-resistant fabrics, personal hygiene products, and food and beverage packaging, it is difficult to collect a sample without contaminating it. It is recommended that water samples be collected by someone specifically trained to sample drinking water for PFAS analysis. Please see the [PFAS- Testing Private Drinking Water factsheet](#) for more testing details and a list of labs.

If you receive your water from a public water system, you can contact your local utility to obtain more information. If you have health concerns about the PFAS levels in your drinking water, consult with your healthcare provider.

### Water Treatment

Based on the laboratory results from your water system, you may want to install a PFAS water treatment system in your home. These treatment systems may be installed:

- At the point of entry (POE), where treatment for all the water entering the household plumbing system occurs.
- At the point of use (POU), which is often at the kitchen sink or primary source of water for drinking or cooking (potentially also including a water line to the refrigerator if it has a plumbed-in water line).

Each type of water treatment system has pros and cons that should be considered before selecting the best treatment option for a home. The type of treatment system chosen should consider the volume of water that will be used in the home, the number and location of sites where water is consumed in the home, and the type of PFAS chemicals identified by laboratory testing. More information about POE water treatment for PFAS is available [here](#) and about POU treatment [here](#).

## Is bottled water a safer alternative?

Bottled water may be a safer alternative if your usual drinking water supply is known to be contaminated with PFAS. Bottled water producers are required to obtain their source water from locations that meet the federal MCLs effective June 25, 2024. However, it's important to be sure the producer of the bottled water is obtaining their water from a source that tests for PFAS in their product and treats for them if high levels are found. Bottled water with high levels of PFAS is no safer than any other contaminated water supply.

## For more information:

For more information on PFAS, including the health effects of PFAS, PFAS in drinking water, water testing, and treatment, and other PFAS activities in Ohio, visit the [Ohio PFAS webpage](#).

If you have any questions about private drinking water system testing and treatment, contact the ODH Residential Water and Sewage Program at [privatewater@odh.ohio.gov](mailto:privatewater@odh.ohio.gov) or (614) 644-7558.

For more information on PFAS and your health, contact the ODH Health Assessment Section at [BEH@odh.ohio.gov](mailto:BEH@odh.ohio.gov) or (614) 728-9452.