MassDEP Fact Sheet

Per- and Polyfluoroalkyl Substances (PFAS) in Drinking Water: Questions and Answers for Consumers

1. What are PFAS and how are people exposed to them?

Per- and Polyfluoroalkyl Substances are a group of chemical compounds called PFAS. Two PFAS chemicals, perfluorooctanoic acid (PFOA) and perfluorooctane sulfonic acid (PFOS), were extensively produced and are the most studied and regulated of these chemicals. Several other PFAS that are similar to PFOS and PFOA exist. These PFAS are contained in some firefighting foams used to extinguish oil and gas fires. They have also been used in a number of industrial processes and to make carpets, clothing, fabrics for furniture, paper packaging for food and other materials (e.g., cookware) that are resistant to water, grease and stains. Because these chemicals have been used in many consumer products, most people have been exposed to them.

While consumer products and food are the largest source of exposure to these chemicals for most people, drinking water can be an additional source of exposure in communities where these chemicals have contaminated water supplies. Such contamination is typically localized and associated with a specific facility, for example, an airfield at which they were used for firefighting or a facility where these chemicals were produced or used.

2. What is the Massachusetts drinking water standard?

On October 2, 2020, MassDEP published its PFAS public drinking water standard or Massachusetts Maximum Contaminant Level (MMCL) of 20 nanograms per liter (ng/L), or parts per trillion (ppt) applicable to community (COM) and non-transient non-community (NTNC) systems for the sum of the concentrations of six specific PFAS. The six PFAS are: perfluorooctane sulfonic acid (PFOS); perfluorooctanoic acid (PFOA); perfluorohexane sulfonic acid (PFHxS); perfluorononanoic acid (PFNA); perfluoroheptanoic acid (PFHpA); and perfluorodecanoic acid (PFDA). MassDEP abbreviates this set of six PFAS as “PFAS6.” This drinking water standard is set to be protective against adverse health effects for all people consuming the water. For information on the PFAS6 drinking water standard see: 310 CMR 22.00: The Massachusetts Drinking Water Regulations. For more information about the technical details behind the MMCL, see MassDEP’s technical support document at: Per- and Polyfluoroalkyl Substances (PFAS): An Updated Subgroup Approach to Groundwater and Drinking Water Values.

3. What are the EPA drinking water standards?

On April 10, 2024, the United States Environmental Protection Agency (EPA) announced National Primary Drinking Water Regulations (NPDWR) for six Per- and Polyfluoroalkyl Substances (PFAS).

MassDEP will adopt regulations for public water suppliers (PWS) that are no less stringent than the EPA regulations.

EPA's Maximum Contaminant Levels (MCLs) are:
• PFOA – 4.0 parts per trillion (ppt)
• PFOS – 4.0 ppt
• PFNA – 10 ppt
• PFHxS – 10 ppt
• HFPO-DA (commonly known as GenX Chemicals) – 10 ppt
PFHxS, HFPO-DA, PFNA, and PFBS – Hazard Index (HI) = 1 (unitless)
A Hazard Index accounts for the increased risk from mixtures of PFAS. For more information regarding the Hazard Index for PFAS and how to calculate it see: https://www.epa.gov/system/files/documents/2024-04/pfas-npdwr_fact-sheet_hazard-index_4.8.24.pdf

For more information about EPA's Maximum Contaminant Level Goals (MCLGs) and MCLs for PFAS see https://www.epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas .

Note that the four PFAS chemicals PFOA, PFOS, PFNA, and PFHxS are regulated under both the EPA and current MassDEP drinking water standards. The MassDEP PFAS6 standard also includes the two PFAS chemicals PFHpA and PFDA. The EPA standards also includes the two PFAS chemicals HFPO-DA and PFBS.

4. What health effects are associated with exposure to the regulated PFAS chemicals?

The MassDEP drinking water standard is based on studies of the PFAS6 chemicals in laboratory animals and studies of exposed people. Overall, these studies indicate that exposure to sufficiently elevated levels of the PFAS6 compounds may cause developmental effects in fetuses during pregnancy and in breastfed infants. Effects on the thyroid, the liver, kidneys, hormone levels and the immune system have also been reported. Some studies suggest a cancer risk may exist following long-term exposures to elevated levels of some of these compounds.

It is important to note that consuming water with PFAS6 above the drinking water standard does not mean that adverse effects will occur. The degree of risk depends on the level of the chemicals and the duration of exposure. The drinking water standard assumes that individuals drink only contaminated water, which typically overestimates exposure, and that they are also exposed to PFAS6 from sources beyond drinking water, such as food. To enhance safety, several uncertainty factors are additionally applied to account for differences between test animals and humans, and to account for differences between people. Scientists are still working to study and better understand the health risks posed by exposures to PFAS. If your water has been found to have PFAS6, HFPO-DA or PFBS and you have specific health concerns, you may wish to consult with your doctor.

5. How can I find out about contaminants in my drinking water?

If you get your water from a public water system, you should contact them for this information. For a contact list for all public water systems in the Commonwealth you may visit:
https://www.mass.gov/media/831461/download

For private well owners see the Per- and Polyfluoroalkyl Substances (PFAS) in Private Well Drinking Water Supplies FAQ for more information.

6. What options should be considered when PFAS6 in drinking water is above MassDEP's PFAS6 drinking water standard and/or when PFOA, PFOS, PFNA, PFHxS, HFPO-DA, and PFBS are above EPA drinking water standards?

✓ Sensitive subgroups, including pregnant or nursing women, infants and people diagnosed by their health care provider to have a compromised immune system, should consider using bottled water that has been tested for PFAS, for their drinking water, cooking of foods that absorb water (like pasta) and to make infant formula. Bottled water that has been tested for PFAS, or formula that does not require adding water, are alternatives.

✓ For older children and adults, the MMCL is applicable to a lifetime of consuming the water. For these groups, shorter duration exposures present less risk. However, if you are concerned about your exposure while steps are taken to assess and lower the PFAS concentration in your drinking water, use of bottled water that has been tested for PFAS will reduce your exposure.

✓ Water contaminated with PFAS can be treated by some home water treatment systems that are "NSF/ANSI 53" or "NSF/ANSI 58" certified to remove PFAS. These may include point of entry (POE) systems, which treat all the water entering a home, or point of use (POU) devices, which treat water where it is used, such as at a faucet.

✓ In most situations the water can be safely used for washing and rinsing foods and washing dishes.

✓ For washing items that might go directly into your mouth, like dentures and pacifiers, only a small amount of water might be swallowed and the risk of experiencing adverse health effects is very low. You can minimize any risk by not using water with PFAS greater than the EPA and MassDEP drinking water standards to wash such items.

✓ The water can be safely used by adults and older children for brushing teeth. However, use of bottled water should be considered for young children as they may swallow more water than adults when they brush their teeth. If you are concerned about your exposure, even though the risk is very low, you could use bottled water for these activities.

✓ Because PFAS are not well absorbed through the skin, routine showering or bathing are not a significant concern unless PFAS levels are very high. Shorter showers or baths, especially for children who may swallow water while playing in the bath, or for people with severe skin conditions (e.g., significant rashes) would limit any exposure from the water.

✓ For pets or companion animals, the health effects and levels of concern to mammalian species, like dogs, cats and farm animals, are likely to be similar to those for people. However, because these animals are different sizes, have different lifespans, and drink different amounts of water than people it's not possible to predict what health effects an animal may experience from drinking water long-term with PFAS concentrations greater than the MCL. There is some evidence that birds may be more sensitive to PFAS. There is little data on PFAS effects on other species like turtles, lizards, snakes and fish. As a precaution, if you have elevated levels of PFAS in your water, you may wish to consider using alternative water for your pets. If you have concerns, you may also want to consult with your veterinarian.

✓ For gardening or farming, certain plants may take up some PFAS from irrigation water and soil. Unfortunately, there is not enough scientific data to predict how much will end up in a specific crop. Since people eat a variety of foods, the risk from the occasional consumption of produce grown in soil or irrigated with water contaminated with PFAS is likely to be low. Families who grow a large fraction of their produce would experience higher potential exposures and should consider the following steps, which should help reduce PFAS exposures from gardening:

- Maximize use of rainwater or water from another safe source for your garden.
- Wash your produce in clean water after you harvest it.
- Enhance your soil with clean compost rich in organic matter, which has been reported to reduce PFAS uptake into plants.
- Use raised beds with clean soil.

• **NOTE ON BOILING WATER:** Boiling water will not destroy these chemicals and will increase their levels somewhat due to water evaporation.
• **NOTE ON BOTTLED WATER:** Bottled water should only be used if it has been tested. The Massachusetts Department of Public Health (MDPH) requires companies licensed to sell or distribute bottled water or carbonated non-alcoholic beverages to test for PFAS. See https://www.mass.gov/info-details/water-quality-standards-for-bottled-water-in-massachusetts. In 2022, the MDPH conducted a pilot surveillance program on PFAS in bottled water sold in Massachusetts. All bottled water test results met the MassDEP PFAS6 and the US EPA's drinking water standards .
• **NOTE ON POU and POE TREATMENT DEVICES:** Point of Use (POU) and Point of Entry (POE) treatment devices are not specifically designed to meet Massachusetts' or EPA's drinking water standard for PFAS. Any treatment device you use should be certified to meet "NSF/ANSI 53" or "NSF/ANSI 58" standards. Although such certification documents that a treatment device can remove PFAS, it's important to note that the current certification standards for PFAS filters (as of April 2024) do not yet indicate that a filter will remove PFAS down to the levels EPA has now set for a drinking water standard. EPA is working with standard-setting bodies to update their filter certifications to match EPA's new requirements. If you chose to install a treatment device, you should check to see if the manufacturer has independently verifiable PFAS monitoring results demonstrating that the device can reduce PFAS below the MassDEP and EPA drinking water standards. See more detailed information on POU/POE treatment systems in the Private Well Factsheet at https://www.mass.gov/info-details/pfas-in-private-well-drinking-water-supplies-faq?

7. Where can I get more information on PFAS?

MassDEP PFAS Information. https://www.mass.gov/info-details/per-and-polyfluoroalkyl-substances-pfas

Per- and Polyfluoroalkyl Substances (PFAS) in Private Well Drinking Water Supplies FAQ: https://www.mass.gov/info-details/pfas-in-private-well-drinking-water-supplies-faq

Massachusetts Department of Public Health PFAS webpage: https://www.mass.gov/service-details/per-and-polyfluoroalkyl-substances-pfas-in-drinking-water

USEPA National Primary Drinking Water Regulation for PFAS see: https://www.epa.gov/sdwa/and-polyfluoroalkyl-substances-pfas

Association of State Drinking Water Administrators PFAS webpage https://www.asdwa.org/pfas/

The Centers for Disease Control and Prevention's (CDC's) Public Health Statement for PFAS can be found at: https://www.atsdr.cdc.gov/pfas/index.html

CDC's fact sheet on PFAS and Breastfeeding is located at: https://www.atsdr.cdc.gov/pfas/health-effects/pfas-breastfeeding.html

8. Where can I find more information about Treatment Devices for PFAS?

MassDEP information on home drinking water treatment devices: https://www.mass.gov/service- details/home-water-treatment-devices-point-of-entry-and-point-of-use-drinking-water

USEPA information on PFAS and treatment devices:
https://www.epa.gov/research-states/pfas-treatment-drinking-water-and-wastewater-state-science
and https://www.epa.gov/sciencematters/epa-researchers-investigate-effectiveness-point-usepoint-entry-systems-remove-and
and https://www.epa.gov/system/files/documents/2024-04/water-filter-fact-sheet.pdf (includes links to third parties that certify treatment devices)

For further information on PFAS in drinking water, including possible health effects, you may contact the Massachusetts Department Environmental Protection, Drinking Water Program at program.director-dwp@mass.gov or 617-292-5770.