

Frequently Asked Questions

What are PFAS and what regulations exist about their use?

Per- and polyfluoroalkyl substances (PFAS) are a group of chemicals that are mostly carbon chains with multiple fluorine atoms bonded to them, which are hard to break down and have a wide variety of uses in consumer products and industry. They have recently been recognized as hazardous compounds. Two widely produced compounds have been the focus of most research are perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). The State of Alaska Department of Environmental Conservation (ADEC) has passed a groundwater cleanup level for each compound, and the United States Environmental Protection Agency (EPA) has published a non-enforceable drinking water advisory level called a lifetime health advisory (LHA). Some other states have been working on passing numbers for drinking water protection and contaminated site management and cleanup.

How did my well become contaminated? How does water move through the subsurface?

The depth to groundwater in Fairbanks is very shallow, typically less than 15 feet below the ground surface. PFASs most likely entered the groundwater by draining through the soil at Aqueous Film Forming Foam (AFFF) training and emergency-response sites on Fairbanks International Airport (FAI) property. Once PFASs entered the water, they traveled with the water around permanently frozen soils. Groundwater flow through areas of discontinuous permafrost is complex and difficult to predict. In some cases, nearby wells can have significantly different PFAS concentrations.

Can I drink my well water? What about my pets?

If levels of PFOS or PFOA, or the two combined, are at or above the LHA level of 70 parts per trillion (ppt), we recommend that you do not drink your tap water or use it to prepare baby formula. We also suggest that you avoid giving it to pets and other animals.

Is it safe to cook with my well water?

If your well water has levels of PFOS or PFOA, or the two combined, at or above the LHA level, we recommend that you do not use your well water to cook, even if you heat or boil it first. Boiling water does not remove PFOS and PFOA.

Is it safe to shower, take baths, and brush my teeth with my well water?

It is very unlikely that showering or taking baths with well water could cause health problems. This is because:

- Your skin does not absorb (take in) enough PFOS and PFOA to cause problems. Also, PFOS and PFOA do not irritate the skin.
- PFOS and PFOA do not move easily from water to air, so it is unlikely that you would breathe it in when showering or bathing.
- If your water contains PFOS or PFOA at concentrations above the LHA level, you can reduce exposure by using an alternative or treated water source for brushing teeth, and any activity that might result in ingestion of your well water.

Can I clean, wash dishes, wash clothes, and rinse food with my well water?

It is safe to use well water to clean your house, wash dishes, and do laundry. However, we recommend that you rinse food with clean water.

Can I breastfeed my child if I have been drinking my well water?

Breastfeeding is linked with numerous health benefits for both infants and mothers. At this time, it is recommended that nursing mothers continue to breastfeed. The science on the health effects of PFAS for mothers and babies is evolving. However, given the scientific understanding at this time, the benefits of breastfeeding outweigh any known risk. To better weigh the risks and benefits of breastfeeding, please talk to your doctor.

Is it safe to water my vegetable garden with my well water?

We do not have a clear answer to this question at this time. Some studies have shown that vegetables grown in soil with high levels of PFAS may absorb these chemicals. But this could depend on a lot of different factors (e.g., level of PFAS in water, the type of PFAS contamination, the amount of garden watering, and the type of produce grown).

One study showed that garden plants watered with water contaminated with PFAS took in only very small amounts of these chemicals. The study also noted that the health benefits of eating fresh vegetables outweigh any health risks from small amounts of PFAS.

Soil particles can stick to plants, vegetables, and fruits. Low-lying plants, leafy vegetables (e.g., spinach and lettuce) and root crops (e.g., potatoes and carrots) are more likely to have soil particles on them and possibly contribute to human exposure through incidental ingestion. Some studies show that PFAS can accumulate at low levels in plant roots. Uptake of contaminants by the roots of a plant may move into other portions of the plant but usually at even lower concentrations. Your exposure to PFAS through garden vegetables is not likely to be significant compared to other primary exposure routes such as drinking contaminated water.

In the end it is up to you. Some people living near FAI may feel more comfortable using a different water source with confirmed lower PFAS levels for their vegetable gardens. However, if you choose to use your well water for your garden, we recommend you wash your vegetables with clean water and peel root vegetables.

How can PFAS affect my health?

Scientists are not yet certain about the possible health effects resulting from human exposure to PFAS at levels typically found in our food and water. More research is needed to confirm or rule out possible links between health effects of potential concern and exposure to PFAS. The following articles offer more information:

- www.atsdr.cdc.gov/pfc/index.html
- www.epa.gov/sites/production/files/2016-06/documents/drinkingwaterhealthadvisories_pfoa_pfos_updated_5.31.16.pdf

At this time, we cannot tell if drinking well water near FAI in Fairbanks could be causing any current health problems, or if it will cause problems in the future. Residents are encouraged to contact the Alaska Section of Epidemiology at 907-269-8000 with questions or concerns.

Will these contaminants ever leave the groundwater?

PFAS are persistent compounds, which means they do not readily biodegrade. It is likely that the groundwater will have significant concentrations of PFAS for decades to come.

Is the contamination moving to new areas?

At this point, we do not have enough data to predict contaminated groundwater movement, but based on the existing data and the amount of time since the releases, it is likely that the plume is relatively stable. Groundwater monitoring will be conducted over time to answer this question.

What about the vertical distribution of the contamination? Can I deepen my well?

ADEC regulations require investigation of the vertical extent of groundwater contamination. We are investigating variations in PFAS concentrations with well depth. Based on knowledge of similar plumes in the Fairbanks area, it is possible that contamination is present in excess of 100 feet in some locations.

What cleanup will occur?

Right now, the focus is on preventing exposure to the contaminants rather than cleanup. The FAI will be gathering additional information to help determine what cleanup actions are feasible. There are few remedial technologies for PFAS that are proven to be effective and practicable for addressing large groundwater contaminant plumes.

Can I continue using my well if it has PFAS contamination?

If your well water contains PFOS or PFOA at concentrations above EPA's LHA level, we do not recommend continuing to use the well for drinking water. If your well water contains either PFOS or PFOA at concentrations above the groundwater cleanup levels of 400 ppt, continued use of the well is not recommended once an alternative water supply is available, because continued use results in on-going discharge of a hazardous substance that exceeds a cleanup level. If your well contains PFOS or PFOA at concentrations between the LHA level and groundwater cleanup levels, further evaluation is necessary.

Is all of this information public?

Yes. ADEC has a database to track project milestones for all contaminated sites

<https://dec.alaska.gov/Applications/SPAR/PublicMVC/CSP/SiteReport/26816>. In addition, ADEC has a site summary

page containing general information about the site (<http://dec.alaska.gov/spar/csp/sites/fairbanks-international-airport-pfas.htm>). Copies of reports and other documents can be provided following a formal written request to the department.

What is Risk Management and why do I need to contact them?

FAI is a state owned and operated airport. The State of Alaska, through the Division of Risk Management, administers the self-insurance program for each state agency covering all sudden and accidental property and casualty claims. In order to start the claims process, the Division of Risk Management must receive a written claim from each affected party in relation to the PFAS water contamination.

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Will I be responsible for paying my water bill after I am connected to College Utilities?

At this time the airport does not have authority to offer any ongoing payment source or stipend to residents. However, affected residents can submit this for review as part of your written claim to Risk Management.

My neighbors will be connected to College Utilities. Why am I being left out?

Anyone whose well tests above the EPA's LHA level of 70 ppt will be connected to College Utilities after filing their claim with Risk Management. If your well tests above 35 ppt but below 70 ppt ongoing monitoring of your well will need to take place. If your well exceeds 70 ppt, you will then be connected to College Utilities at that time. If you believe that you should be connected to College Utilities and your well water is below 70 ppt, contact Risk Management and file a claim.

How long has FAI used firefighting foam?

The airport has been using AFFF for more than 30 years, as required by the Federal Aviation Administration.

How are you sharing this information with the public?

All parties are committed to openness and transparency and we will share new information we receive through multiple channels in order to reach as many affected residents as possible.

- Website: dot.alaska.gov/faigroundwater
- Facebook: Fairbanks International Airport
- Twitter: @Fly_Fairbanks
- GovDelivery: <https://public.govdelivery.com/accounts/AKDOT/subscriber/new?>
- Email: FAIgroundwater@alaska.gov



Per- and Polyfluoroalkyl Substances (PFAS) and Your Health

Human exposure to per- and polyfluoroalkyl substances (PFAS) is a public health concern that the Centers for Disease Control and Prevention's (CDC) National Center for Environmental Health (NCEH) and the Agency for Toxic Substances and Disease Registry (ATSDR) are helping our local, territorial, tribal, state, and federal partners address. Over the last decade, interest in PFAS has been growing. ATSDR and our state health partners are investigating exposure to and possible health effects associated with PFAS in more than 30 communities across the United States.

PFAS are man-made chemicals that have been used in industry and consumer products worldwide since the 1950s. They have been used in non-stick cookware, water-repellent clothing, stain resistant fabrics and carpets, some cosmetics, some firefighting foams, and products that resist grease, water, and oil.



PFAS Exposure

PFAS are man-made, so there are no natural sources in the environment. However, PFAS can be found near areas where they are manufactured or where products containing PFAS are often used. PFAS can travel long distances, move through soil, seep into groundwater, or be carried through air.

[More >](#)

PFAS Health Effects

The potential for health effects from PFAS in humans is not well understood. PFOS, PFOA, PFHxS and PFNA have generally been studied more extensively than other PFAS. In general, animal studies have found that animals exposed to PFAS at high levels resulted in changes in the function of the liver, thyroid, pancreas and hormone levels.

[More >](#)

ATSDR PFAS Related Sites

ATSDR is involved at a number of PFAS-related sites, either directly or through assisting state and federal partners. As of now, most sites are related to drinking water contamination connected with PFAS production facilities or fire training areas where aqueous film-forming firefighting foam (AFFF) was regularly used.

[More >](#)

Additional Resources

CDC/ATSDR

- [Perfluoroalkyl and Polyfluoroalkyl Substances \(PFAS\): Information for Clinicians](https://www.atsdr.cdc.gov/emes/pfas_clinicians_training.html) (https://www.atsdr.cdc.gov/emes/pfas_clinicians_training.html)
- [An Overview of Perfluoroalkyl and Polyfluoroalkyl Substances and Interim Guidance for Clinicians Responding to Patient Exposure Concerns](#)
- [PFAS Fact Sheet](#) [PDF - 62 KB]
- [PFAS Family Tree – Community](#) [PDF - 282 KB]
- [ToxFAQs™ for Perfluoroalkyls](http://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=1116&tid=237) (http://www.atsdr.cdc.gov/toxfaqs/tf.asp?id=1116&tid=237)
- [Toxicological Profile for Perfluoroalkyls](http://www.atsdr.cdc.gov/toxprofiles/tp.asp?id=1117&tid=237) (http://www.atsdr.cdc.gov/toxprofiles/tp.asp?id=1117&tid=237)

[More >](#)

File Formats Help:

How do I view different file formats (PDF, DOC, PPT, MPEG) on this site?

(<https://www.cdc.gov/Other/plugins/>)

(<https://www.cdc.gov/Other/plugins/#pdf>)

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Content source: Agency for Toxic Substances and Disease Registry (<https://www.atsdr.cdc.gov>)

PFAS Health Effects

The health effects of PFOS, PFOA, PFHxS, and PFNA have been more widely studied than other per- and polyfluoroalkyl substances (PFAS). Some, but not all, studies in humans with PFAS exposure have shown that certain PFAS may:

- affect growth, learning, and behavior of infants and older 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 cancer

Scientists are still learning about the health effects of exposures to mixtures of PFAS.

For the most part, laboratory animals exposed to high doses of one or more of these PFAS have shown changes in liver, thyroid, and pancreatic function, as well as some changes in hormone levels. Because animals and humans process these chemicals differently, more research will help scientists fully understand how PFAS affect human health.

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Content source: Agency for Toxic Substances and Disease Registry (<https://www.atsdr.cdc.gov>)

Overview

EPA has established health advisories for PFOA and PFOS based on the agency's assessment of the latest peer-reviewed science to provide drinking water system operators, and state, tribal and local officials who have the primary responsibility for overseeing these systems, with information on the health risks of these chemicals, so they can take the appropriate actions to protect their residents. EPA is committed to supporting states and public water systems as they determine the appropriate steps to reduce exposure to PFOA and PFOS in drinking water. As science on health effects of these chemicals evolves, EPA will continue to evaluate new evidence.

Background on PFOA and PFOS

PFOA and PFOS are fluorinated organic chemicals that are part of a larger group of chemicals referred to as perfluoroalkyl substances (PFASs). PFOA and PFOS have been the most extensively produced and studied of these chemicals. They have been used to make carpets, clothing, fabrics for furniture, paper packaging for food and other materials (e.g., cookware) that are resistant to water, grease or stains. They are also used for firefighting at airfields and in a number of industrial processes.

Because these chemicals have been used in an array of consumer products, most people have been exposed to them. Between 2000 and 2002, PFOS was voluntarily phased out of production in the U.S. by its primary manufacturer. In 2006, eight major companies voluntarily agreed to phase out their global production of PFOA and PFOA-related chemicals, although there are a limited number of ongoing uses. Scientists have found PFOA and PFOS in the blood of nearly all the people they tested, but these studies show that the levels of PFOA and PFOS in blood have been decreasing. While consumer products and food are a large source of exposure to these chemicals for most people, drinking water can be an additional source in the small percentage of communities where these chemicals have contaminated water supplies. Such contamination is typically localized and associated with a specific facility, for example, an industrial facility where these chemicals were produced or used to manufacture other products or an airfield at which they were used for firefighting.

EPA's 2016 Lifetime Health Advisories

EPA develops health advisories to provide information on contaminants that can cause human health effects and are known or anticipated to occur in drinking water. EPA's health advisories are non-enforceable and non-regulatory and provide technical information to states agencies and other public health officials on health effects, analytical methodologies, and treatment technologies associated with drinking water contamination. In 2009, EPA published provisional health advisories for PFOA and PFOS based on the evidence available at that time. The science has evolved since then and EPA is now replacing the 2009 provisional advisories with new, lifetime health advisories.

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PFOA & PFOS Drinking Water Health Advisories

EPA's 2016 Lifetime Health Advisories, continued

To provide Americans, including the most sensitive populations, with a margin of protection from a lifetime of exposure to PFOA and PFOS from drinking water, EPA established the health advisory levels at 70 parts per trillion. When both PFOA and PFOS are found in drinking water, the combined concentrations of PFOA and PFOS should be compared with the 70 parts per trillion health advisory level. This health advisory level offers a margin of protection for all Americans throughout their life from adverse health effects resulting from exposure to PFOA and PFOS in drinking water.

How the Health Advisories were developed

EPA's health advisories are based on the best available peer-reviewed studies of the effects of PFOA and PFOS on laboratory animals (rats and mice) and were also informed by epidemiological studies of human populations that have been exposed to PFASs. These studies indicate that exposure to PFOA and PFOS over certain levels may result in adverse health effects, including developmental effects to fetuses during pregnancy or to breastfed infants (e.g., low birth weight, accelerated puberty, skeletal variations), cancer (e.g., testicular, kidney), liver effects (e.g., tissue damage), immune effects (e.g., antibody production and immunity), thyroid effects and other effects (e.g., cholesterol changes).

EPA's health advisory levels were calculated to offer a margin of protection against adverse health effects to the most sensitive populations: fetuses during pregnancy and breastfed infants. The health advisory levels are calculated based on the drinking water intake of lactating women, who drink more water than other people and can pass these chemicals along to nursing infants through breastmilk.

Recommended Actions for Drinking Water Systems

Steps to Assess Contamination

If water sampling results confirm that drinking water contains PFOA and PFOS at individual or combined concentrations greater than 70 parts per trillion, water systems should quickly undertake additional sampling to assess the level, scope and localized source of contamination to inform next steps

Steps to Inform

If water sampling results confirm that drinking water contains PFOA and PFOS at individual or combined concentrations greater than 70 parts per trillion, water systems should promptly notify their State drinking water safety agency (or with EPA in jurisdictions for which EPA is the primary drinking water safety agency) and consult with the relevant agency on the best approach to conduct additional sampling.

Drinking water systems and public health officials should also promptly provide consumers with information about the levels of PFOA and PFOS in their drinking water. This notice should include specific information on the risks to fetuses during pregnancy and breastfed and formula-fed infants from exposure to drinking water with an individual or combined concentration of PFOA and PFOS above EPA's health advisory level of 70 parts per trillion. In addition, the notification should include actions they are taking and identify options that consumers may consider to reduce risk such as seeking an alternative drinking water source, or in the case of parents of formula-fed infants, using formula that does not require adding water.

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PFOA & PFOS Drinking Water Health Advisories

Recommended Actions for Drinking Water Systems, continued

Steps to Limit Exposure

A number of options are available to drinking water systems to lower concentrations of PFOA and PFOS in their drinking water supply. In some cases, drinking water systems can reduce concentrations of perfluoroalkyl substances, including PFOA and PFOS, by closing contaminated wells or changing rates of blending of water sources. Alternatively, public water systems can treat source water with activated carbon or high pressure membrane systems (e.g., reverse osmosis) to remove PFOA and PFOS from drinking water. These treatment systems are used by some public water systems today, but should be carefully designed and maintained to ensure that they are effective for treating PFOA and PFOS. In some communities, entities have provided bottled water to consumers while steps to reduce or remove PFOA or PFOS from drinking water or to establish a new water supply are completed.

Many home drinking water treatment units are certified by independent accredited third party organizations against American National Standards Institute (ANSI) standards to verify their contaminant removal claims. NSF International (NSF®) has developed a protocol for NSF/ANSI Standards 53 and 58 that establishes minimum requirements for materials, design and construction, and performance of point-of-use (POU) activated carbon drinking water treatment systems and reverse osmosis systems that are designed to reduce PFOA and PFOS in public water supplies. The protocol has been established to certify systems (e.g., home treatment systems) that meet the minimum requirements. The systems are evaluated for contaminant reduction by challenging them with an influent of $1.5 \pm 30\%$ $\mu\text{g}/\text{L}$ (total of both PFOA and PFOS) and must reduce this concentration by more than 95% to $0.07 \mu\text{g}/\text{L}$ or less (total of both PFOA and PFOS) throughout the manufacturer's stated life of the treatment system. Product certification to this protocol for testing home treatment systems verifies that devices effectively reduces PFOA and PFOS to acceptable levels.

Other Actions Relating to PFOA and PFOS

Between 2000 and 2002, PFOS was voluntarily phased out of production in the U.S. by its primary manufacturer, 3M. EPA also issued regulations to limit future manufacturing, including importation, of PFOS and its precursors, without first having EPA review the new use. A limited set of existing uses for PFOS (fire resistant aviation hydraulic fluids, photography and film products, photomicro lithography process to produce semiconductors, metal finishing and plating baths, component of an etchant) was excluded from these regulations because these uses were ongoing and alternatives were not available.

In 2006, EPA asked eight major companies to commit to working toward the elimination of their production and use of PFOA, and chemicals that degrade to PFOA, from emissions and products by the end of 2015. All eight companies have indicated that they have phased out PFOA, and chemicals that degrade to PFOA, from emissions and products by the end of 2015. Additionally, PFOA is included in EPA's proposed Toxic Substance Control Act's Significant New Use Rule (SNUR) issued in January 2015 which will ensure that EPA has an opportunity to review any efforts to reintroduce the chemical into the marketplace and take action, as necessary, to address potential concerns.

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PFOA & PFOS Drinking Water Health Advisories

Other Actions Relating to PFOA and PFOS, continued

EPA has not established national primary drinking water regulations for PFOA and PFOS. EPA is evaluating PFOA and PFOS as drinking water contaminants in accordance with the process required by the Safe Drinking Water Act (SDWA). To regulate a contaminant under SDWA, EPA must find that it: (1) may have adverse health effects; (2) occurs frequently (or there is a substantial likelihood that it occurs frequently) at levels of public health concern; and (3) there is a meaningful opportunity for health risk reduction for people served by public water systems.

EPA included PFOA and PFOS among the list of contaminants that water systems are required to monitor under the third Unregulated Contaminant Monitoring Rule (UCMR 3) in 2012. Results of this monitoring effort are updated regularly and can be found on the publicly-available National Contaminant Occurrence Database (NCOD) (<https://www.epa.gov/dwucmr/occurrence-data-unregulated-contaminant-monitoring-rule#3>). In accordance with SDWA, EPA will consider the occurrence data from UCMR 3, along with the peer reviewed health effects assessments supporting the PFOA and PFOS Health Advisories, to make a regulatory determination on whether to initiate the process to develop a national primary drinking water regulation.

In addition, EPA plans to begin a separate effort to determine the range of PFAS for which an Integrated Risk Information System (IRIS) assessment is needed. The IRIS Program identifies and characterizes the health hazards of chemicals found in the environment. IRIS assessments inform the first two steps of the risk assessment process: hazard identification, and dose-response. As indicated in the 2015 IRIS Multi-Year Agenda, the IRIS Program will be working with other EPA offices to determine the range of PFAS compounds and the scope of assessment required to best meet Agency needs. More about this effort can be found at <https://www.epa.gov/iris/iris-agenda>.

Non-Drinking Water Exposure to PFOA and PFOS

These health advisories only apply to exposure scenarios involving drinking water. They are not appropriate for use, in identifying risk levels for ingestion of food sources, including: fish, meat produced from livestock that consumes contaminated water, or crops irrigated with contaminated water.

The health advisories are based on exposure from drinking water ingestion, not from skin contact or breathing. The advisory values are calculated based on drinking water consumption and household use of drinking water during food preparation (e.g., cooking or to prepare coffee, tea or soup). To develop the advisories, EPA considered non-drinking water sources of exposure to PFOA and PFOS, including: air, food, dust, and consumer products. In January 2016 the Food and Drug Administration amended its regulations to no longer allow PFOA and PFOS to be added in food packaging, which will likely decrease one source of non-drinking water exposure.

Where Can I Learn More?

- EPA's Drinking Water Health Advisories for PFOA and PFOS can be found at: <https://www.epa.gov/ground-water-and-drinking-water/drinking-water-health-advisories-pfoa-and-pfos>
- PFOA and PFOS data collected under EPA's Unregulated Contaminant Monitoring Rule are available: <https://www.epa.gov/dwucmr/occurrence-data-unregulated-contaminant-monitoring-rule>
- EPA's stewardship program for PFAS related to TSCA: <https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/and-polyfluoroalkyl-substances-pfas-under-tsca>
- EPA's research activities on PFASs can be found at: <http://www.epa.gov/chemical-research/perfluorinated-chemical-pfc-research>
- The Agency for Toxic Substances and Disease Registry's Perfluorinated Chemicals and Your Health webpage at: <http://www.atsdr.cdc.gov/PFC/>

