

NBK Bangor Virtual Open House Materials

September–October 2020

POSTERS

Why Is the Navy Sampling Drinking Water Wells Nationwide?

To request sampling, click the sampling icon below the poster station or call **844-NBKBNGR (844-625-2647).**

The Navy is committed to protecting our neighbors' drinking water and taking responsibility for our previous operations.

- In 2016, the EPA established a drinking water lifetime health advisory for two currently unregulated PFAS, specifically PFOS and PFOA.
- The most common historical Navy use of PFOS and PFOA was in firefighting foam.
- The Navy no longer uses firefighting foam for training.

- In 2016, the Navy issued a protective policy to identify and prioritize sites with the potential for exposure to PFOS and PFOA.
- The Navy has started assessing bases to identify and address the potential for exposure to PFOS and PFOA.
- The Navy has identified possible PFAS release areas. We need your help to determine if there are impacts to drinking water wells.



ACRONYMS & ABBREVIATIONS

EPA U.S. Environmental Protection Agency PFAS per- and polyfluoroalkyl substances

PFOA perfluorooctanoic acid PFOS perfluorooctane sulfonate

Path Forward

To request sampling, click the sampling icon below the poster station or call 844-NBKBNGR (844-625-2647).

Removal Actions The Navy will be involved until necessary May be implemented at any time within the process actions are complete. . A response implemented in an expedited manner to address situations that require prompt action The science and regulation are evolving; Removal action response type is based on situation, urgency, and required planning period Washington State is developing State Action **Emergency Removal Action** Time-Critical Non-Time-Critical ٠ Levels for five PFAS in drinking water. Response required immediately Removal Action Removal Action Time-Critical and Non-Time-Critical The Navy will provide Public involvement is encouraged throughout Removal Actions may include: bottled water for Point of service treatment cooking and drinking the process. to households whose Hook up to alternative source water exceeds the EPA NBK Bangor's website will be updated New well lifetime health advisory Others to be determined throughout the clean-up process. for PFOS and/or PFOA.



Potential On-Base PFAS Releases

To request sampling, click the sampling icon below the poster station or call 844-NBKBNGR (844-625-2647).



- A Preliminary Assessment is underway because of previous uses of **PFAS-containing** materials, such as firefighting foam.
- NBK Bangor is following the EPA's **Environmental Cleanup** Process for assessment of PFAS releases.

- 23 on-base areas have been identified as potential PFAS release areas.
- Findings are documented in a Preliminary Assessment report, which regulators are currently reviewing. The final version will be available by the end of 2020.

Installation boundary LEGEND Shallow aquifer aroundwater divide

PFAS per- and polyfluoroalkyl substances

Potential PFAS release area

1

0.5

U.S. Environmental Protection Agency EPA

NBK

Naval Base Kitsap

NBK Bangor Site Inspection

To request sampling, click the sampling icon below the poster station or call 844-NBKBNGR (844-625-2647).

Objectives of Site Inspection

- The objective of the site inspection is to confirm if there is a release of PFAS to soil and/or groundwater and develop the conceptual site model:
 - Measuring PFOS and PFOA concentrations in on-base soil and groundwater (beginning 2021)
 - Determining aquifer characteristics, including groundwater flow and direction
 - Identifying potentially impacted off-base drinking water wells based on on-base and off-base groundwater results
- Partnering with multi-agency team in activities that include:
 - Evaluating site data and information
 - Planning additional investigation to fill any data gaps
 - Identifying potential removal actions
 - Developing path forward and continuing public outreach

ACRONYMS & ABBREVIATIONS





NBK Bangor Drinking Water

To request sampling, click the sampling icon below the poster station or call **844-NBKBNGR (844-625-2647).**



NBK Naval Base Kitsap PF

Naval Base Kitsap PFAS per- and polyfluoroalkyl substances

NBK Bangor's drinking water meets all safe drinking water standards.

- On-base drinking water wells are upgradient from potential PFAS release areas and collect groundwater from a deeper aquifer.
- On-base drinking water wells were tested for PFAS in 2014 and will be resampled in the fall of 2020.
- Results of all water quality sampling can be found in annual Consumer Confidence Reports at: https://www. cnic.navy.mil/regions/cnrnw/om/ environmental_support/water_ quality_information.html



PFAS Drinking Water **Results near NBK Bangor**

To request sampling, click the sampling icon below the poster station or call 844-NBKBNGR (844-625-2647).



- 292 drinking water samples were collected in the sampling area during initial sampling.
- 209 samples had non-detect values for PFOS and PFOA.
- 83 samples had detections for PFOS and/or PFOA.
 - 2 out of these 83 samples had values above the EPA lifetime health advisory.

ACRONYMS & ABBREVIATIONS

U.S. Environmental Protection Agency **EPA** NBK Naval Base Kitsap

PFAS per- and polyfluoroalkyl substances PFOA perfluorooctanoic acid

PFOS perfluorooctane sulfonate



Off-Base Drinking Water Well Sampling

To request sampling, click the sampling icon below the poster station or call 844-NBKBNGR (844-625-2647).



ACRONYMS & ABBREVIATIONS

PFAS per- and polyfluoroalkyl substances

The Navy needs your permission to sample your drinking water well.

- Based on the initial sampling results, the Navy is expanding the off-base sampling area.
- The new sampling area is downgradient of the south initial sampling area.
- If you are in the initial sampling area and your drinking water well was not previously sampled, the Navy would like to sample it for PFAS.

٧ **Initial Off-Base Drinking Water** Well Sampling – North

To request sampling, click the sampling icon below the poster station or call 844-NBKBNGR (844-625-2647).



LEGEND Installation boundary Initial sampling area 0.25 ▲ □ mile N 0.125

ACRONYMS & ABBREVIATIONS

PFOA perfluorooctanoic acid

PFOS perfluorooctane sulfonate

Initial Off-Base Drinking Water Well Sampling – West, East, South

To request sampling, click the sampling icon below the poster station or call **844-NBKBNGR (844-625-2647).**



PFOA perfluorooctanoic acid

PFOS perfluorooctane sulfonate

Expanded Off-Base Drinking Water Well Sampling

To request sampling, click the sampling icon below the poster station or call 844-NBKBNGR (844-625-2647).





PFAS Drinking Water Results near NBK Bangor

To request sampling, click the sampling icon below the poster station or call **844-NBKBNGR (844-625-2647).**



PFAS Drinking Water Results near NBK Bangor

To request sampling, click the sampling icon below the poster station or call 844-NBKBNGR (844-625-2647).

The Navy is
taking action on
the EPA lifetime
health advisory.

PFAS	Standard	Limit	Above	Below	Not Detected
PFOA + PFOS	EPA lifetime health advisory	70 ppt	2	81	209
PFOA*	Draft Washington State Action Level	10 ppt	5	47	240
PFOS*	Draft Washington State Action Level	15 ppt	1	62	229
PFBS	Draft Washington State Action Level	860 ppt	0	91	201
PFNA	Draft Washington State Action Level	14 ppt	0	10	282
PFHxS	Draft Washington State Action Level	70 ppt	0	74	218

* These detection counts include the PFOA + PFOS results above.

North – 16 wells sampled

North – 16 wells sampled						South – 70 wells sampled					
PFAS	Standard	Limit	Above	Below	Not Detected	PFAS	Standard	Limit	Above	Below	Not Detected
PFOA + PFOS	EPA lifetime health advisory	70 ppt	0	1	15	PFOA + PFOS	EPA lifetime health advisory	70 ppt	2	17	51
PFOA*	Draft Washington State Action Level	10 ppt	0	1	15	PFOA*	Draft Washington State Action Level	10 ppt	3	12	55
PFOS*	Draft Washington State Action Level	15 ppt	0	1	15	PFOS*	Draft Washington State Action Level	15 ppt	1	10	59
PFBS	Draft Washington State Action Level	860 ppt	0	4	12	PFBS	Draft Washington State Action Level	860 ppt	0	25	45
PFNA	Draft Washington State Action Level	14 ppt	0	0	16	PFNA	Draft Washington State Action Level	14 ppt	0	3	67
PFHxS	Draft Washington State Action Level	70 ppt	0	3	13	PFHxS	Draft Washington State Action Level	70 ppt	0	21	49

West - 136 wells sampled

PFAS	Standard	Limit	Above	Below	Not Detected	PFAS	Standard	Limit	Above	Below	Not Detected
PFOA + PFOS	EPA lifetime health advisory	70 ppt	0	30	106	PFOA + PFOS	EPA lifetime health advisory	70 ppt	0	33	37
PFOA*	Draft Washington State Action Level	10 ppt	1	11	124	PFOA*	Draft Washington State Action Level	10 ppt	1	23	46
PFOS*	Draft Washington State Action Level	15 ppt	0	27	109	PFOS*	Draft Washington State Action Level	15 ppt	0	24	46
PFBS	Draft Washington State Action Level	860 ppt	0	27	109	PFBS	Draft Washington State Action Level	860 ppt	0	35	35
PFNA	Draft Washington State Action Level	14 ppt	0	2	134	PFNA	Draft Washington State Action Level	14 ppt	0	5	65
PFHxS	Draft Washington State Action Level	70 ppt	0	23	113	PFHxS	Draft Washington State Action Level	70 ppt	0	27	43

East - 70 wells sampled

ACRONYMS & ABBREVIATIONS

EPA	U.S. Environmental Protection Agency	PFBS	perfluorobutane sulfonic acid	PFOA	perfluorooctanoic acid
NBK	Naval Base Kitsap	PFHxS	perfluorohexane sulfonic acid	PFOS	perfluorooctane sulfonate
PFAS	per- and polyfluoroalkyl substances	PFNA	perfluorononanoic acid	ppt	part(s) per trillion

Understanding Data Packages

To request sampling, click the sampling icon below the poster station or call **844-NBKBNGR (844-625-2647).**



ND not detected ng/L nanogram(s) per liter PFAS per- and polyfluoroalkyl substances PFOA perfluorooctanoic acid PFOS perfluorooctane sulfonate ppt part(s) per trillion

Understanding Data Packages

To request sampling, click the sampling icon below the poster station or call 844-NBKBNGR (844-625-2647).

How Are Amounts of Chemicals in Samples Reported?

This table is an example of how PFOA results might be reported by the laboratory given the DL, LOD, and LOQ shown on the figure to the left.

Sample	Instrument Result	Reported Result
1	non-detect	ND
2	10	10 J
3	25	25 J
4	30	30
5	40	40

J = Estimated

What Is a Surrogate?

- A substance similar to the analytes of interest
- Not found naturally in the substance
- Intentionally added to the sample at a known amount to monitor the performance of the sample's preparation and analysis

PFOA perfluorooctanoic acid

Per- and Polyfluoroalkyl Substances (PFAS) and Exposure

To request sampling, click the sampling icon below the poster station or call **844-NBKBNGR (844-625-2647).**

Where Do PFAS Come From?

- Manufactured compounds; no natural occurrence.
- Used since 1950s in products and industry.
- Last a long time in the environment.

mengining ioa

food packaging

Exposures to PFAS

- Occurs primarily from swallowing:
 - Impacted water
 - Fish, meat, or crops grown in impacted areas
 - · Food wrapped in PFAS-coated paper or containers
- Breathing or accidentally swallowing PFAS that escapes from products in the home.
- Can reach babies in the womb through placenta and nursing infants through breast milk of exposed mothers.
- Skin contact while bathing or showering is unlikely to be significant exposure.

PFAS in People

- CDC monitoring estimates that most people in the U.S. have PFAS in their bodies.
- Levels of PFOS and PFOA are decreasing in blood serum of the U.S. population following their phase-out from use.
- Some PFAS stay in the body a long time.
- There is no recommended medical treatment to reduce PFAS in the body.

ACRONYMS & ABBREVIATIONS

CDC Centers for Disease Control and Prevention PFAS per- and polyfluoroalkyl substances

PFOA perfluorooctanoic acid PFOS perfluorooctane sulfonate

Health Concerns and Advisory Levels

To request sampling, click the sampling icon below the poster station or call 844-NBKBNGR (844-625-2647).

How Might PFAS Exposure Affect People's Health?

- We are still learning about health effects of PFAS in people, but the most studied PFAS indicate some health risks in people.
- Based on limited evidence from studies with people, potential health effects found to be associated with exposure include:
 - Increased cholesterol levels
 - · Decreased immune response to vaccines
 - Increased risk of thyroid disease
 - · Increased liver enzymes in serum
 - Increased risks of some cancers
- Animal testing with some PFAS shows damage to liver, thyroid, and immune system; PFOS and PFOA exposures resulted in reduced growth, altered development, and some cancers.
- The levels of PFOS or PFOA cannot be linked to an individual's current or future health effects.

What Is the EPA Lifetime Health Advisory?

- Sets a concentration of 70 ppt PFOS and PFOA in drinking water.
- Protects against harmful health effects to sensitive populations and the general public.
- Assumes exposure over a lifetime.
- Provides information to state agencies and public health officials on health effects and water treatment so they can take steps to reduce exposures.
- Is only an advisory and is therefore non-enforceable.

How Was the EPA Health Advisory Calculated?

- Is based on studies of health effects with PFOS and PFOA in laboratory animals.
- Considers information regarding health effects of people exposed to PFOS and PFOA.
- Protects sensitive populations, including babies in the womb of mothers who are exposed.
- Assumes 20 percent of overall exposure is from drinking water, 80 percent of overall exposure is from other sources.

ACRONYMS & ABBREVIATIONS

EPA U.S. Environmental Protection Agency PFAS per- and polyfluoroalkyl substances PFOA perfluorooctanoic acid PFOS perfluorooctane sulfonate ppt part(s) per trillion

Washington is Developing State Action Levels

State Board of Health—Rulemaking

- Washington is in the process of setting State Action Levels for five PFAS.
 - Action Levels are public health goals for long-term water consumption.
 - A draft rule is available. A final rule is expected in mid-2021.

Draft Rule would:

- Require public drinking water systems to test for PFAS.
- Help us understand occurrence of PFAS in Washington State drinking water.
- Ensure that consumers are informed and have information to protect themselves when PFAS are detected.

Acronyn DOH

- DOH Washington State Department of Health PFOA perfluorooctanoic acid
- PFOS perfluorooctane sulfonic acid
- PFNA perfluorononanoic acid PFHxS perfluorohexane sulfonic acid PFBS perfluorobutane sulfonic acid

Draft State Action Levels for per- and polyfluoroalkyl substances (PFAS)

PFOA 10 ppt PFOS 15 ppt PFNA 14 ppt PFHxS 70 ppt PFBS 860 ppt	Individual PFAS	Level in Drinking Water
PFOS 15 ppt PFNA 14 ppt PFHxS 70 ppt PFBS 860 ppt	PFOA	10 ppt
PFNA 14 ppt PFHxS 70 ppt PFBS 860 ppt	PFOS	15 ppt
PFHxS 70 ppt PFBS 860 ppt	PFNA	14 ppt
PFBS 860 ppt	PFHxS	70 ppt
	PFBS	860 ppt

ppt = parts per trillion

Action Levels are Protective

• Protect health over a lifetime of exposure in daily drinking water.

Based on...

- ♦ 2019 DOH review of best available science and more recent health assessments.
- ♦ Higher exposures in breastfeeding infants.
- Assumption that 20-50 percent of PFAS exposure comes from drinking water sources. 50-80 percent can come from other sources such as diet.
- ♦ Long-term exposure (>10 years) in daily drinking water.
- ♦ Minnesota Department of Health, infant exposure model.

٧

Sign Up for Your Sampling Appointment

To request sampling, click the sampling icon below the poster station or call 844-NBKBNGR (844-625-2647).

Off-Base Drinking Water Well Sampling

- The Navy will be sampling drinking water wells in the designated sampling area.
- Sampling is at no cost to you.
- Drinking water samples will be collected Monday, October 26–Wednesday, November 4, 2020.
- General sampling appointments are available
 9 a.m.–6 p.m. Monday–Friday | 9 a.m.–1 p.m.
 Saturday | 1 p.m.–5 p.m. Sunday

Additional times available upon request

- The property owner must give permission for sampling and complete the questionnaire.
- Sampling takes less than an hour.
- An adult (18 years or older) must be present during sampling.

The Navy will provide bottled water if your sampling results are above the EPA lifetime health advisory (70 ppt).

Sampling and Results Timeline

To request sampling, click the sampling icon below the poster station or call **844-NBKBNGR (844-625-2647).**

Sequence of Events	Approximate Timeframe
 Sign up for drinking water well sampling. 	 September 28–October 28, 2020
2. Navy contractor samples well.	 Beginning October 26, 2020
3. Navy receives preliminary results.	 Approximately 1 month after sample collected
	 Within 24 hours of results received
 Navy calls property owner with results. 	 Bottled water distributed if results are above the EPA lifetime health advisory (70 ppt)
 Lab data is verified and Navy mails final lab data to property owner. 	 Approximately 3 months from sampling
ACRONYMS & ABBREVIATIONS	

Drinking Water Sampling Process

To request sampling, click the sampling icon below the poster station or call 844-NBKBNGR (844-625-2647).

Drinking water well sampling is voluntary.

Sampling Process	COVID-19 Precautions
 We need your help to: Make your appointment. Fill out the questionnaire prior to sampling appointment. Samples will be collected by a team of qualified professionals: Team will consist of two members. The water sample will be collected as close to well as possible. Water will run for 5 minutes prior to collection. Samples will be collected and analyzed according to EPA guidelines. 	 The sampling team will take the necessary precautions to minimize exposure. In preparation, please unlock any areas requiring access prior to sampling team arrival. A sampling team member will call you upon arrival; you do not need to meet the team in person. Sampling team members may arrive in separate cars. Sampling team members will be wearing masks and gloves. One team member will collect the sample; the second team member will remain in the car to assist with documentation. Upon completion of sampling, a team member will call you to let you know that sampling is complete.
ACRONYWS & ABBREVIATIONS	

EPA FACT SHEET

FACT SHEET PFOA & PFOS Drinking Water Health Advisories

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.

FACT SHEET

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 <u>combined</u> 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.

FACT SHEET

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 $1.5\pm30\% \mu g/L$ (total of both PFOA and PFOS) and must reduce this concentration by more than 95% to 0.07 $\mu g/L$ 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, photomicrolithography 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.

FACT SHEET

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) (<u>https://www.epa.gov/dwucmr/occurrence-data-unregulated-contaminant-monitoring-rule#3</u>). 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 <u>https://www.epa.gov/iris/iris-agenda</u>.

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

DOH FACT SHEET

In October 2017, the State Board of Health (board) accepted a petition from ten organizations requesting that the state establish drinking water standards for per- and polyfluoroalkyl substances (PFAS).

To support the board, the Department of Health (department) developed draft recommendations for state action levels (SAL) for five PFAS detected in Washington drinking water. The SALs represent health protective levels—expected to be without appreciable health effects over a lifetime of exposure for the general population, including in sensitive subgroups.

Determining health protective values

The five PFAS with SALs (see Table 1, next page) are the best studied of the PFAS commonly detected in our state's drinking water. Our approach to developing SALs involved evaluation of the primary PFAS scientific literature and review of recent assessments by federal agencies and several U.S. states. We selected health protective values from high-quality recent science assessments. We found sufficient information to recommend SALs for PFOA, PFOS, PFNA, PFHxS, and PFBS. Because the first four of these PFAS are highly bioaccumulative in humans and may harm development, the SALs account for unique PFAS exposure pathways of early life stages including placental and lactational transfer using a peer-reviewed model developed by the Minnesota Department of Health. The PFBS SAL has been revised to account for the higher intake of drinking water by infants.

The health protective values for these five PFAS were derived from studies in laboratory animals with support from epidemiological data when available. The primary health concerns with these PFAS are reproductive and developmental toxicity, immune toxicity, liver toxicity, alterations in thyroid hormone levels, and altered serum lipids. PFOA is considered "possibly carcinogenic to humans" by the International Agency for Research on Cancer. Carcinogenicity of other PFAS is less studied.

The SALs in Table 1 define a level in daily drinking water expected to be without appreciable health effects for any of these outcomes. They are comparable to a health advisory level or maximum contaminant level goal (MCLG) in the federal Safe Drinking Water Act. Taking action at these levels is consistent with the mission of providing safe and reliable drinking water.

Table 1 Draft SAL for PFAS						
Draft State Action Level Individual PFAS for Drinking Water						
PFOA	10 ng/L					
PFOS	15 ng/L					
PFNA	14 ng/L					
PFHxS	70 ng/L					
PFBS	860 ng/L					

PFAS frequently appear as mixtures in drinking water. Use of these five SALs, together with the broad mitigation technologies available, provides a reasonable initial approach to protect the public from PFAS mixtures in drinking water. Less is known about the other PFAS although many can be removed by the same mitigation technologies employed to remove the PFAS with SALs. When water systems take public health action based on a PFAS SAL, we encourage them to choose mitigation options that are effective at removing many PFAS such as activated granular carbon and anion exchange resin filtration. Ultimately, a more comprehensive grouped approach to regulation is preferred to a chemical-by-chemical approach given the large size of the PFAS class of chemicals. As the science advances, PFAS could be grouped according to subclasses based on key characteristics such as chemical structure, bioavailability, bioaccumulation potential, toxicity, or mechanism of action. We will consider a grouped approach to regulating PFAS mixtures if a method becomes available that is supported by science.

We prepared a much more detailed technical support document that describes our approach, assumptions, and the derivation of each PFAS SAL. This is available at our PFAS rulemkaing webpage.

Contacts

Jocelyn W. Jones, Rulemaking Project Manager, Department of Health (360) 236-3020 Stuart Glasoe, Policy Advisor—State Board of Health (360) 236-4111

For more Information visit our PFAS rulemaking webpage.

Washington State Department of Health To request this document in another format, call 1-800-525-0127. Deaf or hard of hearing customers, please call 711 (Washington Relay) or email civil.rights@doh.wa.gov.. This and other publications are available at doh.wa.gov/drinkingwater.

CONTACTS

NAVFAC NORTHWEST

PUBLIC AFFAIRS OFFICER

James Johnson PAO_Feedback@navy.mil 360-396-1030

U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

CERCLA CONTACT/ REMEDIAL PROJECT MANAGER

Harry Craig craig.harry@epa.gov 503-326-3689

TOXICOLOGIST/HEALTH QUESTIONS

Elizabeth Allen allen.elizabeth@epa.gov 206-553-1807

WASHINGTON STATE DEPARTMENT OF HEALTH

ENVIRONMENTAL ENGINEER/ STATE ACTION LEVEL QUESTIONS

Andy Anderson andy.anderson@doh.wa.gov 360-236-3025

TOXICOLOGIST/HEALTH QUESTIONS

Barbara Morrissey barbara.morrissey@doh.wa.gov 360-236-3368

WASHINGTON STATE DEPARTMENT OF ECOLOGY

CERCLA CONTACT/ REMEDIAL PROJECT MANAGER Mahbub Alam mahbub.alam@ecy.wa.gov 360-407-6913

KITSAP PUBLIC HEALTH DISTRICT

PUBLIC INFORMATION OFFICER

Tad Sooter pio@kitsappublichealth.org 360-728-2330

NAVFAC

NAVY CHEMISTRY/ UNDERSTANDING DATA PACKAGES

Tim Reisch timothy.reisch@navy.mil 757-322-4130