PFAS Exposure Assessment Community Summary

Airway Heights, Spokane County, Washington

INFORMATION TO PROTECT OUR COMMUNITIES

The Centers for Disease Control and Prevention (CDC) and the Agency for Toxic Substances and Disease Registry (ATSDR) conducted exposure assessments (EAs) in communities that were known to have PFAS in their drinking water and are near current or former military bases. The EAs provide information to communities about levels of PFAS in their bodies and can provide guidance to help people reduce or stop exposure. This document summarizes the exposure assessment results from the City of Airway Heights, Spokane County, Washington, near Fairchild Air Force Base (the Base). The full exposure assessment report is available at https://www.atsdr.cdc.gov/pfas/activities/assessments/sites/spokane-county-wa.html.

Why did we select Airway Heights?

When selecting EA sites, ATSDR considered the extent of PFOA and PFOS contamination in drinking water supplies, the duration over which exposure may have occurred, and the number of potentially affected residents. Airway Heights was one of several sites nationwide identified with PFAS drinking water contamination from use of products such as aqueous film forming foam (AFFF).

As early as the 1970's, the Base used AFFF containing PFAS for firefighter training. Over time, the PFAS from the AFFF entered the ground, moved into the groundwater to offsite locations, and affected nearby municipal wells. PFAS were first detected in Airway Heights municipal wells in May 2017. Airway Heights authorities immediately removed the contaminated drinking water wells from service and provided residents bottled water until drinking water could be obtained from the uncontaminated City of Spokane water supply. By June 2017, the city declared the water safe to drink. Since 2017, Airway Heights has reactivated some of its drinking water wells with treatment systems to remove PFAS.

Based on the information ATSDR has reviewed, the City of Airway Heights public drinking water supply currently meets or is below the U.S. Environmental Protection Agency's (EPA) 2016 health advisory (HA) for PFAS in drinking water. At this time, ***ATSDR does not*** recommend community members who get drinking water from the City of Airway Heights' public water supply use alternative sources of water.

What are PFAS?

PFAS (or "per- and polyfluoroalkyl substances") are a family of man-made chemicals that have been used in industry and consumer products since the 1950s.

PFAS do not occur naturally but are widespread in the environment. Most PFAS (including PFOA, PFOS, PFHxS, and PFNA) are either very resistant to breaking down or degrade into other PFAS that do not degrade further. Certain PFAS will therefore remain in the environment indefinitely. Some studies have shown that PFAS exposure may harm human health.

How was the testing conducted?

ATSDR invited Airway Heights residents who met eligibility criteria to participate in the EA. Household members were eligible if they had: (1) received drinking water from the City of Airway Heights Water Department and lived west of Hayford Road for at least 1 year before June 8, 2017 (these residents have the greatest likelihood of past exposures to PFAS via the public drinking water supplies); (2) been greater than three years old at the time of sample collection; and (3) not been anemic or had a bleeding disorder that would prevent giving a blood sample.

Households with private wells were not eligible for participation. Measuring PFAS in the blood of people from selected households allows us to estimate exposure from consumption of public drinking water for the entire community in the affected area, even those who were not tested.

In November 2019, ATSDR collected samples and other information from participants.

ATSDR analyzed data from **333** people, (286 adults and 47 children) from **168** households

Everyone completed a questionnaire, and most people provided blood and urine samples.

ATSDR collected samples of tap water and dust from some homes.

ATSDR sent each participant their individual results in May 2020 and published community summary results at www.atsdr.cdc.gov/pfas/communities/factsheet/Spokane-County-Community-Level-Results-Factsheet.html.

Key Takeaways

- Levels of some PFAS in the blood of Airway Heights residents were up to fifty-six times higher than national levels.
- Elevated blood levels may be linked with past drinking water contamination.
- Some demographic and lifestyle characteristics were linked with higher PFAS blood levels.
- All tap water samples collected during the EA in 2019 met or were below EPA's health advisory and Washington state public health guidelines for PFAS in drinking water.

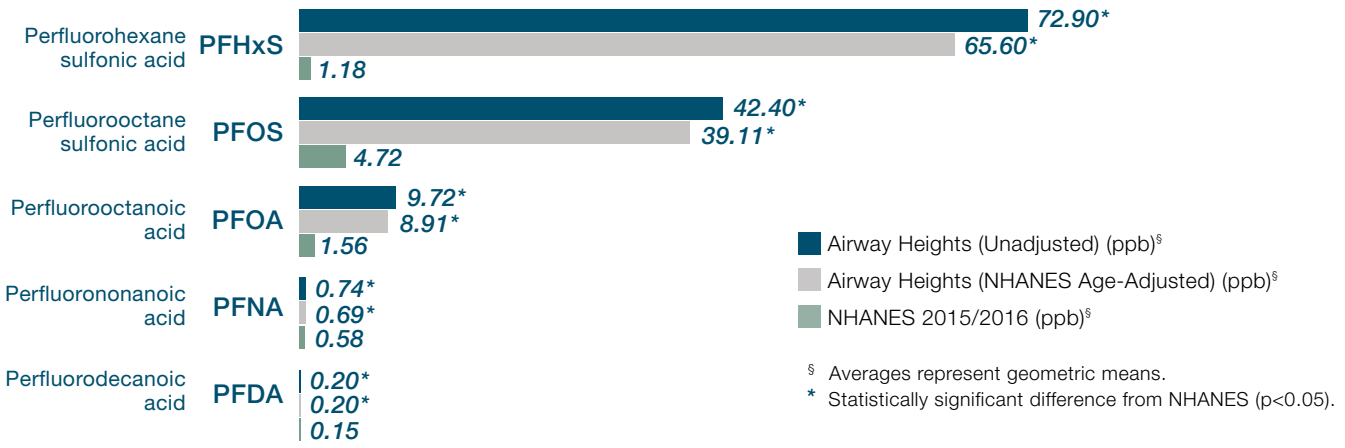
What did we learn about PFAS levels in blood?

Of the seven PFAS tested in Airway Heights, five PFAS were detected in more than 89% of the blood samples collected: PFHxS, PFOS, PFOA, PFNA, and PFDA.

The average blood levels of five PFAS (PFHxS, PFOS, PFOA, PFNA, and PFDA) in Airway Heights EA participants were higher than average levels nationwide.

Since 1999, the National Health and Nutrition Examination Survey (NHANES) has measured PFAS levels in blood in the U.S. population. PFAS levels are shown to be age dependent and tend to increase with age in part due to longer periods of exposure. The initial community summary results showed average levels of three PFAS above national averages. ATSDR adjusted blood levels of EA participants in Airway Heights for age to enable meaningful comparison to the NHANES dataset. After age adjustment, five PFAS were statistically elevated compared to levels nationwide. Age-adjusted averages are more representative of the Airway Heights community.

Airway Heights EA site average PFAS blood levels compared to national averages§



Elevated blood levels of three PFAS in the Airway Heights EA participants may be linked with past contamination of the city's drinking water.

Three PFAS (PFHxS, PFOS, and PFOA) were detected in Airway Heights' drinking water in 2017. We do not know if contamination began earlier, because no data are available before 2017. By 2017, Airway Heights municipal drinking water met the EPA's HA for PFOA and PFOS. There were over 2 years and 5 months between the reduction of exposure via contaminated drinking water and the collection of the EA blood samples. Because of the long half-lives of PFHxS, PFOS, and PFOA in the human body, past drinking water exposures may have contributed to the EA participants' blood levels. Typically, participants who had elevated blood PFHxS levels also had elevated blood PFOS and blood PFOA levels. This suggests a common source of exposure, such as the Airway Heights public water supply (prior to June 8, 2017). Other sources of exposure were not measured but could have contributed to PFAS concentrations measured in blood of the EA participants.

Long-time residents had higher PFHxS, PFOS, and PFOA blood levels.

For every additional year an adult participant lived in Airway Heights, there was an increase in blood **PFHxS (7.2%)**, **PFOS (5.6%)**, and **PFOA (3.9%)** levels.

ATSDR used statistical models to study relationships between various demographic and lifestyle characteristics of the tested residents. The models showed that, in general:

Blood levels of PFHxS, PFOS, and PFOA were higher in older participants.

These PFAS increased by 1.1% to 1.8% for every year of participant age.

Males had 77% higher PFNA blood levels than females.

Participants who ate fast food a few times per month had lower blood PFHxS, PFOS, PFOA, PFNA, and PFDA blood levels

compared to participants who ate fast food a few times per year or less. This finding differs from other studies and may be due to differences in diet and lifestyle correlated with fast food consumption.

Adult participants who identified as non-White or Hispanic had higher PFNA and PFDA blood levels than White, non-Hispanic participants:

PFNA 37% higher | PFDA 33% higher

Female participants' PFAS blood levels decreased with increasing number of child births.

For each child, PFAS levels were

PFHxS 11.7% lower | PFOS 9.3% lower
PFOA 13.7% lower | PFNA 8.1% lower

Participants who reported ever

Using stain-resistant products had 26% higher blood levels of PFDA

than participants who reported never using these products.

LIMITED DATA

Participants who reported

donating blood at least once a year had lower blood levels of PFHxS (67%), PFOA (60%), and PFNA (49%)

than participants who never reported donating blood.

LIMITED DATA

What did we learn about exposure in children?

Two associations were observed in children, though many exposure factors could not be evaluated because of the small number of children who participated.

Children who were breastfed had higher blood levels of PFNA.

However, based on current science, the benefits of breastfeeding outweigh the risks for infants exposed to PFAS in breast milk.

Children who drank formula prepared with tap water had higher PFHxS and PFOS blood levels

than children who never drank formula prepared with tap water. For every month on formula, PFAS levels increased: **2.2% PFHxS | 1.5% PFOS**

Because of the small sample size, results should be interpreted with caution. ATSDR will gather the data from children across all exposure assessment sites and provide a detailed analysis.

What did other testing find in Airway Heights?

Only two PFAS (PFBA, PFHxS) were detected in urine.

All tap water samples collected during the EA in 2019 met or were below EPA's health advisory for PFAS in drinking water.

PFAS contamination in house dust was similar to that reported in other studies (with and without PFAS contamination).

What do these results mean for Airway Heights community members?

This PFAS EA provides evidence that past exposures to PFAS in drinking water have impacted the levels of PFAS in people's bodies. PFAS are eliminated from the body over a long period of time. This allowed ATSDR to measure PFAS even though exposures through drinking water were mitigated, or lowered, years ago.

Although the exposure contribution from PFAS in drinking water in Airway Heights has been mitigated (reduced), there are actions community members and city officials can take to further reduce exposures to PFAS and protect public health.

Based on the recent PFAS drinking water test results from the Airway Heights municipal water system, ATSDR does not recommend an alternate source of drinking water at this time.

What can community members do?

Become familiar with Consumer Confidence Reports (http://www.cawh.org/departments/public-works/water-reports) for information on the City of Airway Heights water quality.

Private well owners living in the area affected by PFAS should consider having their wells tested for PFAS if testing has not been conducted before. To learn more about testing wells for PFAS visit: https://ecology.wa.gov/Water-Shorelines/Water-supply/Wells/Testing-drinking-water. Global public health organization NSF International has developed a test method to verify a water filter's ability to reduce PFOA and PFOS to below the health advisory levels set by the EPA. NSF International-approved devices can be found at: https://info.nsf.org/Certified/DWTU/. Click on "reduction devices" at the bottom of the page for PFOA and PFOS.

Nursing mothers should continue breastfeeding. Based on current science, the benefits of breastfeeding outweigh the risks for infants exposed to PFAS in breast milk.

When possible, eliminate or decrease potential exposure to PFAS in consumer products such as stain-resistant products, and food packaging materials. To learn more, visit: https://www.fda.gov/food/chemical-contaminants-food/questions-and-answers-pfas-food.

Discuss any health concerns or symptoms with your health care provider. Share results of PFAS blood testing with your health care provider and make them aware of ATSDR resources for clinicians (https://www.atsdr.cdc.gov/pfas/resources/info-for-health-professionals.html). Follow the advice of your health care provider and the recommendations for checkups, vaccinations, and health screening tests.

For additional information about environmental exposures and children's health, contact the Pediatric Environmental Health Specialty Units, a nationwide network of experts in reproductive and children's environmental health (https://www.pehsu.net/).

Follow the advice of your child's health care provider and the recommendations for well child checkups, vaccinations, and health screening tests. Consult https://health.gov/myhealthfinder to help identify those vaccinations and tests.

Pay attention to advisories about food consumption, such as local fish advisories.

At this time, ATSDR does not have plans to conduct additional blood testing for PFAS or recommend PFAS EA participants get individually retested for PFAS in blood.

The biological half-lives of many of the PFAS measured in people's blood are long. PFHxS, in particular, has one of the longest half-lives–some estimates range in the decades. This means that PFAS blood levels are not expected to change significantly in the near term, even if exposure stops.

Additionally, it is unclear what an individual's PFAS test results mean in terms of possible health effects.

For the general population, blood tests for PFAS are most useful when they are part of a scientific investigation like the EA. Test results tell you how much of each PFAS is in your blood, but it is unclear what the results mean in terms of possible health effects. In addition, blood testing for PFAS is not a routine test offered by most doctors or health departments. If you are concerned about the effect of PFAS on your health, talk to your health care provider and make them aware of ATSDR resources for clinicians (https://www.atsdr.cdc.gov/pfas/resources/info-for-health-professionals.html).

What can the City of Airway Heights do?

Operators of the municipal water system should continue to monitor concentrations of PFAS in drinking water delivered to the Airway Heights community to ensure that concentrations of PFAS remain below the EPA's HA for specific PFAS in drinking water.

All treatment systems to remove PFAS from the public drinking water in Airway Heights should be maintained appropriately to ensure that PFAS concentrations remain below the EPA's HA for PFAS in drinking water.

Results of PFAS drinking water monitoring should continue to be shared with community members (Consumer Confidence Reports, http://www.cawh.org/departments/public-works/water-reports).

What will we do next?

ATSDR will hold a meeting to discuss the results and is available to answer questions from the community at any time.

When all of the exposure assessments are complete, we will prepare a report analyzing the data across all sites.

We are also reaching out to doctors, nurses, and other health care providers in your area to provide PFAS information. PFAS clinician guidance and continuing medical education can be found at https://www.atsdr.cdc.gov/pfas/resources/clinical-guidance.html.

About ATSDR

The Agency for Toxic Substances and Disease Registry (ATSDR) is a federal public health agency of the U.S. Department of Health and Human Services. https://www.atsdr.cdc.gov/

For More Information

visit: https://www.atsdr.cdc.gov/
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National Center for Environmental Health
Agency for Toxic Substances and Disease Registry

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