

Testing of Perfluorinated Compounds in Off-Base Drinking Water Wells Former Naval Air Station Brunswick Brunswick, Maine

INTRODUCTION

The Navy is requesting permission to sample drinking water from properties within two designated sampling areas near the former Naval Air Station (NAS) Brunswick, Maine base. The request is being made as a result of recent sampling conducted on the former base that found perfluorinated compounds (PFCs) in groundwater above United States Environmental Protection Agency (EPA) provisional health advisory levels.

Recognizing the potential for the PFCs to move off the former NAS Brunswick property in the groundwater and potentially impacting the quality of drinking water for nearby residents, the Navy would like to sample these select drinking water wells. The Navy has been working with the EPA and the Maine Department of Environmental Protection (MEDEP) to develop an off-base sampling approach, including identifying the designated sampling areas (outlined in green), as shown in Figures 1 and 2.

properties in the sampling areas is found to contain PFCs at or above the EPA provisional health advisory levels, the Navy will provide alternate drinking water supplies while a long-term solution is implemented.

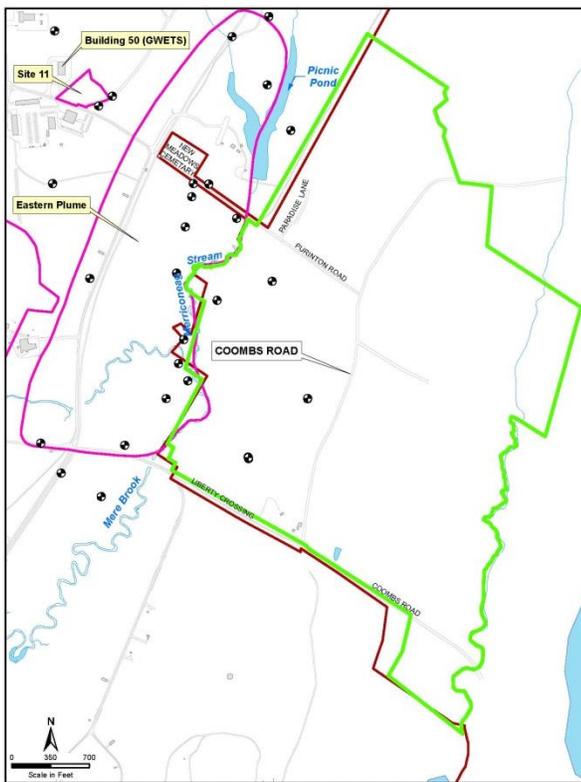


Figure 1 – Approximate Extent of Eastern Sampling Area

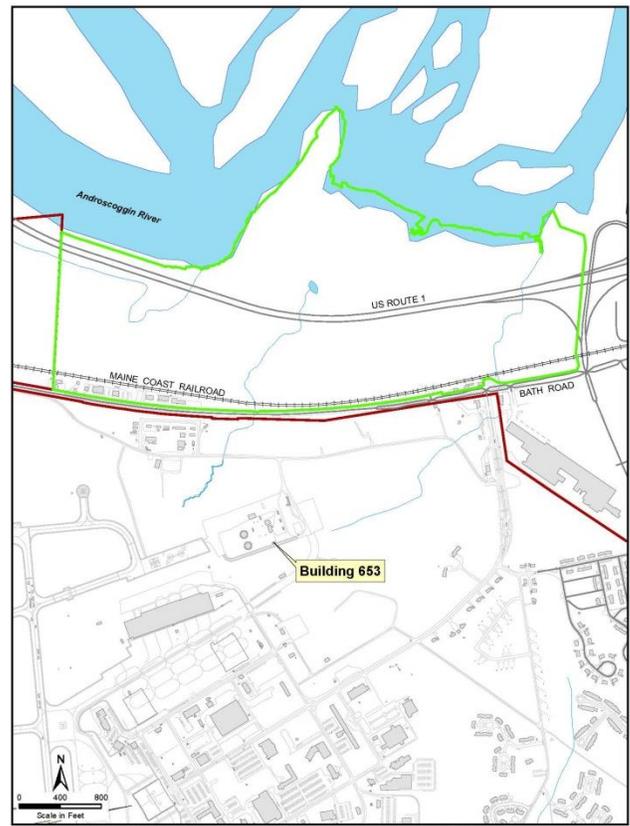


Figure 2 – Approximate Extent of Northern Sampling Area

This fact sheet provides additional information on PFCs, PFC investigations conducted so far, plans for off-base drinking water sampling and planned actions once the results are available.

ABOUT PFCs

PFCs are man-made chemicals and have been used since the 1950s in many household and industrial products because of their stain and water repellent properties. PFCs are present virtually everywhere in the world because of the large amounts that have been manufactured and used. Once these compounds are released to the environment they break down very slowly, and thus, are present in much of the natural environment today.

Currently, PFCs are classified as unregulated or “emerging” contaminants, because there is no Safe Drinking Water Act regulatory standard or routine water

There is no legal requirement to conduct the drinking water testing. It is a voluntary measure because the water quality both on-base and for our off-base neighbors is the priority for the Navy. If the drinking water in any of the off-base

quality testing requirements. PFCs are being studied by the EPA to determine if regulation is needed.

HEALTH INFORMATION

The EPA's Office of Water has issued provisional health advisory levels for two PFCs, perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). Provisional health advisory levels are not regulatory standards. They are health-based concentrations above which the EPA recommends action should be taken to reduce exposure. Currently, the EPA provisional health advisory level for PFOS is 0.2 parts per billion (ppb) and 0.4 ppb for PFOA. However, the EPA may change these levels in the near future based on additional studies that are being conducted.

Exposure to PFOS and PFOA appears to be widespread. Studies have found both compounds in the blood samples of the general human population and wildlife nationwide. Exposure to PFOS and PFOA through ingestion is the primary health concern for people. Studies on exposed human populations indicate PFOS and/or PFOA may cause elevated cholesterol levels and possible low infant birth weight. When animals are given large doses, they exhibit developmental, reproductive and liver effects. Other studies suggest a link with certain cancers.

Health effects from exposure to low levels of PFOS and PFOA are not well known and studies are continuing. At this time, it is not possible to link exposures to PFOS and PFOA in water to a person's individual health issues. Blood tests are available, but they are not routinely done because the results can be inconclusive and test results do not predict health effects. Long term exposure effects are still being investigated by EPA. Based on what is known and still unknown about PFOS and PFOA, the EPA recommends people not drink or cook with water that contains PFOS and/or PFOA at or above the provisional health advisory levels.

PFCs AT FORMER NAS BRUNSWICK

The most common historic Navy use of PFCs has been during activities involving fire-fighting foam. At the former NAS Brunswick base, PFC-containing foam was used in years past for fire-fighting training and in fire suppression systems within buildings such as former Navy aircraft hangars.

Initial environmental studies looking at PFCs were completed at former fire training areas and more recent studies have focused on basewide areas. These studies have shown that PFOS and PFOA have been found in groundwater above the EPA provisional health advisory levels primarily in the central portion of the former NAS Brunswick base, at Site 11 (the former Fire Training Area) and within the Eastern Plume. Other areas where PFOS and PFOA have been found above the EPA provisional health advisory levels include Building 653 (located in the northern portion of the former base) and an area south of

the airport apron. PFOS concentrations are higher in the northern, central, and the area south of the airport apron, while PFOA concentrations are higher south of Hangar 4 (located in the central portion of the former base), north, and west of Site 11 (the former Fire Training Area) and within the Eastern Plume.

The areas where PFOS and PFOA are present in groundwater above the EPA provisional health advisory levels are located in areas where groundwater is not used as drinking water. However, properties north of the former base may use groundwater as drinking water; therefore, sampling in this area is planned. Similarly, while the use of groundwater at the Eastern Plume is restricted, there are residential homes located near this area that are using groundwater as a drinking water source, thus additional sampling is planned.

PFCs AT BUILDING 653

Building 653 is located in the northern portion of the former base (see Figure 2) and formerly contained an emergency fire suppression system for former fuel tanks. Historically, the building was struck by lightning and the fire suppression system activated, releasing fire foam to the surrounding area.

Groundwater in the Building 653 area has been sampled and results show that both PFOS and PFOA have been detected above the EPA provisional health advisory levels. The maximum detected concentration of PFOS was 24 ppb and the maximum detected PFOA concentration was 0.63 ppb.

Because PFCs have been identified in the northern portion of the former base, the Navy would like to sample the off-base drinking wells in this area for PFCs.

PFCs AT THE EASTERN PLUME

The Eastern Plume is located west of Merriconeag Stream and the designated sampling area, as shown in Figure 1. The Eastern Plume consists of groundwater contamination attributed to past activities at Site 4 (Acid Caustic Pit), Site 11 (the former Fire Training Area) and Site 13 (Defense Reutilization and Marketing Office). Contaminants include volatile organic compounds (VOCs) and 1,4-dioxane. These contaminants are primarily located in the groundwater above bedrock (called the overburden groundwater) but are also found in the groundwater in two bedrock areas – one near Huey Drive and another in an area east of Site 11 (the former Fire Training Area). Groundwater sampling for VOCs has been occurring since 1995 and since 2004 for 1,4-dioxane; monitoring for VOCs and 1,4-dioxane still continues today.

Groundwater within the Eastern Plume has been sampled for PFCs since 2012. Results show that both PFOS and PFOA have been detected above the EPA provisional health advisory levels.

- In the northern and central portion of the plume, results show that the maximum detected concentration of PFOS was 0.65 ppb within this area. In this same area, PFOA concentrations range from 1.4 to 15 ppb.
- In the southern portion of the plume, PFOS and PFOA are found at much lower concentrations than in the northern and central portion. Results in this area show that PFOS is either not present or detected well below the EPA provisional health advisory, with the exception of one monitoring well which showed that PFOS was above the EPA provisional health advisory level (detected at 0.32 ppb). However, additional sampling at that monitoring well showed that PFOS was not present. Results show that PFOA are detected above the EPA provisional health advisory level, with a maximum detected concentration of 1.2 ppb.

PFCs are primarily found in the overburden groundwater within the Eastern Plume; however, PFOA was shown to be present above the EPA provisional health advisory in a bedrock monitoring well in the central portion of the plume (detected at 1.6 ppb). Other bedrock wells within the Eastern Plume show PFOS and PFOA are either not present, or are present at concentrations that were below the EPA provisional health advisory levels.

EASTERN PLUME TREATMENT PLANT

In June 1995, a treatment plant began operating to cleanup VOCs in the groundwater. The treatment plant was later modified to also treat 1,4-dioxane, and full operation for treatment of 1,4-dioxane began in March 2010. The treatment plant has been successfully treating VOCs and 1,4-dioxane. To date, over 200 gallons of material have been removed, and the treated water continues to show that VOCs and 1,4-dioxane concentrations are below actions levels.

With the discovery of PFCs in groundwater within the Eastern Plume, the treatment plant was again modified to also treat PFCs. In November 2015, the carbon-based material that treats the VOCs was replaced with new materials that treat PFCs and VOCs. Samples have been collected and results show that the materials are removing PFCs and VOCs. The water discharged from the treatment plant has also been tested and PFOS has not been detected in any of the samples. PFOA results have primarily been not detected, or in one event, detected at very low levels and well below the EPA provisional health advisory level. Samples will continue to be collected to monitor the treatment of PFCs, as well as VOCs and 1,4-dioxane.

In addition to treating contaminants, the treatment plant also helps control any movement of the Eastern Plume (see Figure 1). Wells that pump groundwater to the treatment plant influence where and how groundwater flows. The pumping ensures that contaminated groundwater does not migrate toward surface water.

PREVIOUS DRINKING WATER WELL SAMPLING

As part of on-going groundwater sampling associated with the Eastern Plume, sampling has been conducted to see if VOCs and 1,4-dioxane are present in certain off-base drinking wells. The sampling included some of the drinking water wells in the planned eastern sampling area. Results of this sampling did not identify contaminants related to the Eastern Plume in the drinking water wells.

Because PFCs have now been identified in the Eastern Plume, the Navy would like to sample the off-base drinking wells for PFCs (see Figure 1). The planned sampling will include analyzing water samples for PFCs as well as VOCs and 1,4-dioxane to confirm they are still not present in drinking water wells.

PFCs SAMPLED IN OTHER AREAS

In addition to sampling PFCs at the former NAS Brunswick property, the Navy has also completed sampling at the local water supply and at a natural spring located north of the former base property. Results from these samples show that PFOS and PFOA were not present.

Samples were also collected from the Mere Creek Golf Course water supply. The water was sampled for contaminants related to the Eastern Plume (PFOS, PFOA, VOCs and 1,4-dioxane). Results show that VOCs, 1,4-dioxane and PFOA were not present and that PFOS was detected at a very low level (well below the EPA provisional health advisory level).

PFCs SAMPLED AT THE TOWN WATER SUPPLY

The Brunswick & Topsham Water District have sampled the town water for PFCs under an EPA program called “The Third Unregulated Contaminant Monitoring Rule”, commonly referred to as “UCMR 3”. This program requires sampling for unregulated contaminants, like PFCs, in public water systems. Samples were collected in 2015 by the water district, and the results indicate that PFCs were not found in the town water supply.

NEXT STEP – SAMPLE OFF-BASE FOR PFCs

Under the Navy’s Environmental Restoration Program, PFC studies will continue on-base as well as off-base. Our first priority is to determine if PFCs are present in the drinking water of nearby properties, and, if so, taking appropriate action as needed.

Off-base properties selected for sampling will require permission from the property owner. Once we have permission, the Navy will coordinate the sampling. At the time of sampling, a questionnaire will be completed to gather information about the drinking water well and any filtration or treatment systems being used. This information will help with selecting the appropriate sample location (e.g., at the first spigot inside a home, at the tap, etc.) as well as later when evaluating the sampling results and developing additional sampling plans, as needed. The questionnaire and sampling process should take less than 1 hour to complete.

The Navy expects to obtain necessary access permission and complete the sampling between April and June 2016.

POTENTIAL ACTIONS BASED ON RESULTS

Results from the sampling of drinking water wells are expected in July 2016. The Navy will keep these results private to the extent permitted by law. The Navy will provide notification to each property owner of their personal drinking water results for their property.

The Navy will provide an alternate water source (for example, bottled water) for drinking and cooking to property owners if their drinking water sample is found to contain PFOS or PFOA at or above the EPA provisional health advisory levels. An alternate water source will also be provided to properties in the eastern sampling area if VOCs or 1,4-dioxane are at or above action levels associated with the Eastern Plume. The Navy will continue to provide alternate water at no cost to the property owners until a long term solution can be put in place.

Once all the data are available, the Navy, EPA and MEDEP will determine the next steps based on the results of the sampling. The Navy will notify each property owner if follow on actions are necessary.

SAMPLING OUTSIDE THE SELECTED AREA

The Navy will work with the EPA and MEDEP to determine if the sampling results indicate that the sampling area needs to be expanded to include additional properties near the former NAS Brunswick property.

FOR MORE INFORMATION

To answer any questions you may have on the sampling program, please contact Paul Burgio, Navy BRAC Environmental Coordinator, at 215-897-4903 or via email at paul.burgio@navy.mil.