Off-Base Private Drinking Water Removal Action, near Naval Base Kitsap-Bangor, Silverdale, Washington

PREPARED FOR: Naval Facilities Engineering Systems Command (NAVFAC) Northwest (NW)

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1.0 Purpose

This Action Memorandum (AM) was prepared by Naval Facilities Engineering Systems Command (NAVFAC) Northwest (NW) per Subsections 300.415 (b) and (n)(2) of Title 40 of the *Code of Federal Regulations*, as part of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). The Department of the Navy (Navy) is the lead agency, under Executive Order 12580, for Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) actions at NBK-Bangor. NBK-Bangor is currently listed on the National Priorities List. The purpose of the memorandum is to document the preferred alternatives identified in the Non-Time-Critical Removal Action (NTCRA) Engineering Evaluation and Cost Analysis (EE/CA) (CH2M HILL, Inc. [CH2M], 2023) to address perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) in one drinking water well for one off-base residential property near NBK-Bangor, in Silverdale, Washington.

The Navy has implemented one Time-Critical Removal Action (TCRA) in response to the discovery of PFOS and PFOA in private drinking water wells near NBK-Bangor at concentrations above 70 nanograms per liter (ng/L). The TCRA, an emergency removal action, included supplying bottled water to residents for drinking and cooking where water from private drinking water wells were found to have PFOS and/or PFOA levels which exceed 70 ng/L threshold (Navy, 2020).

The Navy is implementing an NTCRA at one property near NBK-Bangor to provide the residents with another drinking water option besides bottled water. The NTCRA will reduce the burden that bottled water usage may have on the residents, while maintaining protectiveness. The NTCRA alternatives include no additional action, point-of-entry (POE) water treatment with granular activated carbon, POE water treatment with ion exchange, drilling a new single-home drinking water well for the resident in an unimpacted aquifer, and connecting the affected property to the Silverdale Water District (SWD) water supply.

2.0 Site Conditions and Background

Naval activities began at NBK-Bangor when the U.S. Naval Magazine, Bangor, was established to provide a deep-water shipment facility for ordnance. From 1944 into the early 1970s, the Navy facility at Bangor was primarily used for shipment and storage of ordnance and demilitarization of unserviceable and dangerous ammunition. In February 1977, NBK-Bangor was commissioned as the West Coast homeport for the Trident Submarine Launched Ballistic Missile System. NBK-Bangor's current mission is to provide administrative and personnel support for submarine force operations and logistical support for other Navy activities (CH2M, 2020).

In 2016, the Deputy Assistant Secretary of the Navy (Environment) issued a memorandum to address past releases of PFAS, under the Navy Environmental Restoration Program (Navy, 2016). In response to the 2016 memorandum, the Navy assessed sites with a known or potential PFAS release and prioritized sites with drinking water supply within 1 mile downgradient from the release site. A preliminary assessment (PA) for PFAS at NBK-Bangor was conducted in 2020 to identify potential PFAS sources at NBK-Bangor and identify areas requiring further investigation (CH2M, 2020). Twenty-three areas were recommended for further evaluation in a site inspection (SI) as potential or confirmed PFAS release areas in the PA.

A desktop evaluation of off-Base drinking water sources was conducted as part of the PA following the identification of confirmed PFAS release areas. The objective of this evaluation was to determine whether groundwater is used as drinking water within 1 mile downgradient of the confirmed PFAS release areas identified in the PA, consistent with the Navy's 2016 policy memo (Navy, 2016). The evaluation concluded that groundwater is used as drinking water near NBK-Bangor and that private drinking water wells are located within 1 mile downgradient of the confirmed PFAS release areas, consistent with the Navy's 2016 policy memo. Off-Base drinking water sampling was initiated in 2020. To date, 343 off-base private drinking water wells have been sampled by the Navy. PFOA and/or PFOS were detected in 97 drinking water wells, of which two had detections above 70 ng/L. The two impacted residential wells supply two private residences (CH2M, 2023). As a result, bottled water was provided to both private residences under the TCRA (Navy 2020). One of the residences had an exceedance in the initial sample result; however, results from nine subsequent sampling events were below 70 ng/L. The Navy determined that the results data from this residential well did not indicate a long-term removal action is required to protect human health. Results for PFOA and/or PFOS from the other private drinking water well continue to be detected above 70 ng/L and a long-term removal action for this residence is warranted (CH2M, 2023). Following the initial voluntary drinking water sampling performed near NBK-Bangor in 2020, a periodic drinking water sampling program was implemented to monitor PFAS in the drinking water well where PFAS was detected above 70 ng/L and adjacent residences with drinking water wells. The periodic drinking water sampling program includes bi-annual sampling to evaluate temporal and spatial variability of PFAS.

The SI fieldwork was completed in 2022 and included collection of soil and groundwater samples from 22 areas identified in the PA as potential PFAS release areas and will determine whether a release has occurred during historic activities in these areas. SI results will be documented in the SI report to be finalized by December 2023.

3.0 Threats to Public Health or Welfare or the Environment, and Statutory and Regulatory Authorities/Endangerment Determination

Potential releases of pollutants and contaminants may present an imminent and substantial endangerment to public health, welfare, and the environment. Any historical release on Navy facilities has the potential to impact groundwater and drinking water adjacent to the Navy facilities. However, the source and extent of PFOS and PFOA is not yet known. The Navy is continuing to assess potential exposure through drinking water adjacent to the facilities and will complete subsequent site inspections and remedial investigations based on findings.

The Navy has identified one off-base drinking water well near NBK-Bangor potentially impacted by past releases of PFAS-containing materials from NBK-Bangor. The property owners were notified within 24 hours of receipt of preliminary analytical results and were provided bottled water within 48 hours as a TCRA under CERCLA. Bottled water will continue to be provided to the impacted property owner until a long-term solution is implemented to provide drinking water with below 70 ng/L PFOS and/or PFOA.

4.0 Removal Action and Estimated Costs

The Navy evaluated five alternatives as part of the Engineering Evaluation/Cost Analysis (EE/CA) (CH2M, 2023).

The EE/CA develops and evaluates removal action alternatives for protecting human health by preventing human ingestion of impacted groundwater from the one off-Base drinking water well with total combined PFOA and PFOS concentrations above 70 ng/L. The nature and extent of PFOA and PFOS in groundwater and potential risks associated with future use of impacted groundwater are being evaluated separately as part of a Remedial Investigation.

The EE/CA compares five general categories of removal actions based on their effectiveness, implementability, and cost, to address current exposure to drinking water at the off-Base property impacted with PFOA and/or PFOS above 70 ng/L.

The removal action objective (RAO) in the EE/CA addresses current off-base human receptors ingesting groundwater used as drinking water at levels above the 70 ng/L for PFOA and/or PFOS. The RAO was designed to

protect current off-base human receptors from ingestion of PFOA and/or PFOS at levels that exceed 70 ng/L in groundwater used as drinking and cooking water.

The EE/CA was made available for a 30-day public comment period. Notice of its availability for public review, along with a summary of the EE/CA, was published in the North Kitsap Herald and Kitsap Sun.

- No additional action (continue supplying bottled water to affected off-Base residences)
- Point-of-Entry (POE) water treatment (treatment at the existing household water supply wellhead) with granular activated carbon
- POE water treatment (treatment at the existing household water supply wellhead) with ion exchange
- Drilling a new single-home well for the resident in an unimpacted aquifer, if possible
- Connection to the SWD water supply

Based on the evaluation of the alternatives presented in the EE/CA, the Navy has identified connecting the affected residence (associated with one residential drinking water well) to the SWD drinking water distribution system as the most protective and efficient long-term solution.

Roughly 490 linear feet of distribution piping and associated water supply pumping improvements will be installed to support the connection. The total baseline construction cost for this project is preliminarily estimated at $201,723. Variability and uncertainty in these estimated costs could still be on the order of plus or minus 30 to 50 percent, consistent with typical estimate variability noted for conceptual and feasibility study project predesign planning under AACE International (formerly the Association for the Advancement of Cost Engineering) Class 4 estimating guidelines. Thus, total construction costs could potentially be as high as $302,584. The Navy estimates the implementation of all removal action components (including the design and construction) may take up to 1 year after the AM is signed.

The following are reasons why this is the most protective and effective solution for the impacted residence.

- Continuing to supply bottled water for drinking and cooking will address PFOS and/or PFOA impacts; however, it is considered comparatively minimally effective because water may continue to be used for non-potable purposes and therefore, rereleased to the environment in septic leach fields with no controls. Therefore, this alternative does not contribute to the effective performance of a potential future groundwater remedy.
- Drilling a new private well is considered minimally effective because PFAS concentration and distribution within the aquifer is not yet fully defined. It is unknown whether an aquifer groundwater with concentrations below 70 ng/L combined PFOA and/or PFOS, suitable for drinking water, exists at depths where construction of a drinking water well is practical at the location of the affected residence. For this alternative, until the PFOA and PFOS source, fate, and transport conceptual model are identified, there is a risk that groundwater used as the replacement water source could become impacted with PFOA and/or PFOS under long-term pumping.
- POE water treatment alternatives are considered effective solutions because PFOA and/or PFOS are removed from the groundwater supply through treatment. However, these alternatives have long-term associated maintenance and monitoring requirements that must be conducted in a timely manner to maintain effectiveness.
- Connection to public water supply is considered effective because PFOA- and/or PFOS-impacted groundwater is no longer used to provide water to affected residences, thus eliminating receptor exposure (based on current SWD water quality). In addition, PFOA and/or PFOS would not be released back into the environment through disposal of wastewater (via the septic system). Furthermore, the existing drinking water well will be fully abandoned and decommissioned preventing the potential for release to the environment through irrigational use. This alternative is the most flexible with respect to adaptability to environmental conditions as it removes the use of groundwater as the source of drinking water at impacted residence.

The Navy is continuing to evaluate potential PFOS and/or PFOA exposure to the public via drinking water well withdrawals downgradient of NBK-Bangor. If additional drinking water samples above 70 ng/L are identified, the Navy will immediately supply bottled water, consistent with the 2020 Emergency Removal AM (Navy, 2020) for the impacted residences until a long-term removal action is evaluated, selected, and implemented.

5.0 Expected Change in the Situation Should Action be Delayed or Not Taken

If recommended removal action is delayed or not performed, bottled water will continue to be provided until the SWD water connection is complete. Failure to provide clean drinking water to residents with impacted drinking water would result in exposure to PFOS and/or PFOA above 70 ng/L.

6.0 Future Regulatory Standards for PFAS

This removal action is being performed for off-base drinking water based on the exceedance of 70 ng/L for PFOS and/or PFOA. On March 14, 2023, the EPA proposed a draft regulatory drinking water standard for certain PFAS, including PFOA and PFOS. In response, the Department of Defense (DoD) has issued the following statement:

“DoD respects and values the public comment process on this proposed nationwide drinking water rule and looks forward to the clarity that a final regulatory drinking water standard for PFAS will provide. In anticipation of the final standard that EPA expects to publish by the end of 2023, the DoD is assessing what actions DoD can take to be prepared to incorporate EPA’s final regulatory standard into our current cleanup process, such as reviewing our existing data and conducting additional sampling where necessary. In addition, DoD will incorporate nationwide PFAS cleanup guidance, issued by EPA and applicable to all owners and operators under the federal cleanup law, as to when to provide alternate water when PFAS are present.”

7.0 Recommendations

This memorandum documents approval of the NTCRA documented in the EE/CA to address off-Base drinking water exposure to PFOS and/or PFOA for the off-base residence near NBK-Bangor. Conditions at the site meet the NCP Section 300.415(b) criteria for a response action. NAVFAC NW is undertaking this NTCRA.

Approval:

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11/20/2023

J.W. HALE
Captain, United States Navy
Commanding Officer

Date

8.0 Works Cited

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