

Naval Facilities Engineering Systems Command Northwest Silverdale, Washington

Final

Site Inspection Report for Per- and Polyfluoroalkyl Substances

Naval Station Everett Everett, Washington

Naval Radio Station Jim Creek Arlington, Washington

Naval Recreation Complex Pacific Beach Pacific Beach, Washington

October 2023



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Prepared for NAVFAC Northwest by CH2M HILL, Inc. Seattle, Washington Contract N62470-16-D-9000 Contract Task Order 4117



Executive Summary

This report presents the Site Inspection (SI) for per- and polyfluoroalkyl substances (PFAS) at Naval Station (NAVSTA) Everett in Everett, Washington and two associated facilities: Naval Radio Station (NRS) Jim Creek in Arlington, Washington and Naval Recreation Complex (NRC) Pacific Beach in Pacific Beach, Washington.

Background

NAVSTA Everett occupies approximately 117 acres in western Snohomish County adjacent to Port Gardner Bay, within the City of Everett, Washington. NAVSTA Everett was constructed in the early 1990s under the Department of the Navy (Navy) Strategic Homeport Initiative and is currently the home port for six Navy destroyers and two United States Coast Guard vessels (Navy, 2018a). The installation includes buildings and facilities that support ship operations and maintenance, and provide housing and support to homeported sailors.

NRS Jim Creek occupies approximately 3,854 acres in northern Snohomish County approximately 13 miles east of Arlington, Washington. NRS Jim Creek operates and maintains a communication system (Navy, 2018a). The Navy acquired land at NRS Jim Creek in 1949 and constructed the communication system and associated support facilities between 1949 and 1953 (NEESA, 1990). In addition to communication system operations, the Navy currently uses NRS Jim Creek as an outdoor recreational facility for activities such as camping, fishing, boating, hiking, and biking. Current-day buildings include a communication system, outdoor recreational facilities such as cabins and campsites, and supporting facilities.

NRC Pacific Beach occupies approximately 53 acres in western Grays Harbor County adjacent to the Pacific Ocean approximately 36 miles northwest of Aberdeen, Washington. The installation was initially developed by the Navy at the start of World War II as a communications center and a range for training purposes (NEESA, 1991). By 1956, the Navy moved training operations closer to Puget Sound and Seattle. Defense equipment and associated infrastructure, such as gun mounts, ammunition magazines, and related buildings, were demolished and replaced with more conventional structures (NEESA, 1991). By the late 1970s, military housing was no longer required, and the installation was converted into a recreational facility with single-family homes and dormitory-type buildings. In 1984, a 1-acre recreational vehicle and motor home park was built along the northern boundary of the installation which exists to this day. There are currently no active military operations at NRC Pacific Beach.

Preliminary Assessment

A Preliminary Assessment (PA) for PFAS at NAVSTA Everett and associated facilities, including NRS Jim Creek and NRC Pacific Beach (CH2M, 2021), was conducted to identify potential PFAS release areas. ¹ The PA evaluated a total of 50 areas including 22 areas at NAVSTA Everett, 22 areas at NRS Jim Creek, and 6 areas at NRC Pacific Beach. Of these 50 areas, the following 9 were identified as potential PFAS release areas:

- NAVSTA Everett (1 area)
 - Building 2114 (Fire Station)
- NRS Jim Creek (7 areas)
 - Building 6 (Former Fire Station)
 - Site 1 (Building 11 Landfill)
 - Site 6 (Blue Campground Landfill)
 - Site 7 (Pit Road Landfill)
 - Site 4 (Metal Burial Pit)
 - Site 5 (Mixed Waste Landfill)
 - Bio Pit Disposal Area

¹ PFAS release areas were previously referred to as PFAS source areas in the PA report (CH2M, 2021).

- NRC Pacific Beach (1 area)
 - Building 106 (Former Fire Station)

Eight of the nine potential PFAS release areas (all except the Bio Pit Disposal Area at NRS Jim Creek) were recommended in the PA for further investigation as part of an SI. A no further investigation at this time recommendation for the Bio Pit Disposal Area at NRS Jim Creek, which received sludge from stormwater catch basins at the facility, was deferred until the SI pending PFAS sampling results at Building 6.

Site Investigation

The objectives of the SI were identified in the *Final Sampling and Analysis Plan, SI for PFAS, NS Everett, Everett, Washington, NRS Jim Creek, Arlington, Washington, and NRC Pacific Beach, Pacific Beach, Washington* (SAP) (CH2M, 2022):

- For areas identified for an SI during the PA, determine whether PFAS are present in groundwater and soil at concentrations warranting further investigation.
- Refine the understanding of the hydrogeologic characteristics at potential PFAS release areas identified for an SI during the PA and, for NRS Jim Creek only, evaluate the potential for PFAS migration, if present, to on- and off-installation drinking water wells.

Groundwater and soil samples were analyzed for the 18 PFAS compounds listed in Method 537.1 via liquid chromatography tandem mass spectrometry compliant with the Department of Defense and Department of Energy Consolidated Quality Systems Manual for Environmental Laboratories, Version 5.3, in accordance with the laboratory's Environmental Laboratory Accreditation Program Accreditation letters.

Subsequent to the finalization of the Basewide PFAS SI SAP, USEPA regional screening levels (SLs) for perfluorononanoic acid (PFNA), perfluorohexanesulfonic acid (PHxS), and hexafluoropropylene oxide dimer acid (HFPO-DA) were released, and USEPA SLs for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS) were updated. The SL for perfluorobutanesulfonic acid (PFBS) has not been updated since the Basewide PFAS SI SAP was finalized.

In accordance with the June 2022 ASD memorandum (DoD, 2022), groundwater and soil data were screened against the updated SLs (USEPA, 2022). Groundwater data were screened against residential scenario tap water SLs for PFOA, PFOS, PFBS, PFHxS, PFNA, and HFPO-DA presented in the November 2022 Regional Screening Level (RSL) Table (USEPA, 2022). Soil data were screened against residential scenario soil SLs for PFOA, PFOS, PFBS, PFHxS, PFNA, and HFPO-DA presented in the November 2022 Regional Screening Level (RSL) Table (USEPA, 2022). Soil data were screened against residential scenario soil SLs for PFOA, PFOS, PFBS, PFHxS, PFNA, and HFPO-DA presented in the November 2022 RSL Table (USEPA, 2022). RSLs for perfluorobutanoic acid (PFBA) and perfluorohexoanoic acid (PFHxA) were added in the May 2023 RSL update and will be considered in the Remedial Investigation (RI) planning.

The SLs are as follows:

- PFOA Soil SL: 19 micrograms per kilogram (μg/kg), Groundwater SL: 6.0 nanograms per liter (ng/L)
- PFOS Soil SL: 13 μg/kg, Groundwater SL: 4.0 ng/L
- PFBS Soil SL: 1,900 μg/kg, Groundwater SL: 600 ng/L
- PFHxS Soil SL: 130 μg/kg, Groundwater SL: 39 ng/L
- PFNA Soil SL: 19 μg/kg, Groundwater SL: 5.9 ng/L
- HFPO-DA Soil SL: 23 μg/kg, Groundwater SL: 6.0 ng/L

Surface and subsurface soil samples were collected during the installation of the monitoring wells and two soil boring locations at the eight potential PFAS release areas (except at the Bio Pit Disposal Area at NRS Jim Creek as described above). PFAS were detected in surface and subsurface soil samples; however, only PFOS was detected in surface soil above the SLs at Building 2114 (Fire Station) NAVSTA Everett.

Groundwater samples were collected from the newly installed monitoring wells after well development. PFAS were detected in groundwater samples. Groundwater exceedances were detected at Building 2114 (Fire Station) at NAVSTA Everett in two wells for PFOA, PFOS, and PFHxS; at Building 6 (Former Fire Station) at NRS Jim Creek in four wells for PFOS and one well for PFHxS; and at Building 106 (Former Fire Station)/NRC Pacific Beach in two wells for PFOS. All other PFAS detections in groundwater were below the SLs.

The Human Health Risk Screening identified the chemicals of potential concern (COPCs) at Building 2114 (Fire Station) as PFOS and PFHxS for groundwater and at Building 6 (Former Fire Station) as PFOS for groundwater. COPCs were not identified at the other sites for groundwater, and COPCs were not identified for soil.

At this time, no further investigation is recommended for the following areas:

NRS Jim Creek

- Site 1 (Building 11 Landfill)
- Site 6 (Blue Campground Landfill)
- Site 7 (Pit Road Landfill)
- Site 4 (Metal Burial Pit)
- Site 5 (Mixed Waste Landfill)
- Bio Pit Disposal Area

NRC Pacific Beach

• Building 106 (Former Fire Station)

A Remedial Investigation is recommended for Building 2114 (Fire Station) at NAVSTA Everett and Building 6 (Former Fire Station) at NRS Jim Creek to obtain additional data to update the conceptual site model and further evaluate potential human health risks from exposure to PFAS.

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Acronyms and Abbreviations

°F	degree(s) Fahrenheit
ng/L	nanogram(s) per liter
μg/kg	microgram(s) per kilogram
9CI-PF3ONS	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid
11Cl-pF3OudS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid
ADONA	4,8-dioxa-3H-perfluorononanoic acid
AFFF	aqueous film-forming foam
APE	Area of Potential Effect
bgs	below ground surface
btoc	below top of casing
CH2M	CH2M HILL, Inc.
СОРС	chemical of potential concern
CSM	Conceptual Site Model
DoD	Department of Defense
DOH	Washington State Department of Health
Ecology	Washington State Department of Ecology
EPP	Environmental Protection Plan
GW	groundwater
HDPE	high-density polyethylene
HFPO-DA	hexafluoropropylene oxide dimer acid
HHRS	Human Health Risk Screening
IDW	investigation-derived waste
MS	matrix spike
MSD	matrix spike duplicate
NAVFAC	Naval Facilities Engineering Systems Command
NAVSTA	Naval Station
ND	not detected
Navy	Department of the Navy
NEtFOSAA	N-ethyl perfluorooctanesulfonamidoacetic acid
NMeFOSAA	N-methyl perfluorooctanesulfonamidoacetic acid
NRC	Naval Recreation Complex
NRS	Naval Radio Station
NTU	nephelometric turbidity unit
PA	Preliminary Assessment

SITE INSPECTION REPORT FOR PER- AND POLYFLUOROALKYL SUBSTANCES NAVAL STATION EVERETT, EVERETT, WASHINGTON, NAVAL RADIO STATION JIM CREEK, ARLINGTON, WASHINGTON, AND NAVAL RECREATION COMPLEX PACIFIC BEACH, PACIFIC BEACH, WASHINGTON

PFAS	per- and polyfluoroalkyl substances
PFBA	perfluorobutanoic acid
PFBS	perfluorobutanesulfonic acid
PFDA	perfluorodecanoic acid
PFDoA	perfluorododecanoic acid
PFHpA	perfluoroheptanoic acid
PFHxA	perfluorohexoanoic acid
PFNA	perfluorononanoic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctane sulfonate
PFTA	perfluorotetradecanoic acid
PFTrDA	perfluorotridecanoic acid
PFUnA	perfluoroundecanoic acid
PFHxS	perfluorohexanesulfonic acid
ppt	part(s) per trillion
PVC	polyvinyl chloride
QA	quality assurance
QC	quality control
RI	Remedial Investigation
RSL	Regional Screening Level
SAP	Sampling and Analysis Plan
SB	subsurface soil
SCH	Schedule
SL	screening level
SI	Site Inspection
SOP	standard operating procedure
SOSUS	Sound Surveillance System
SS	surface soil
UMCR3	Third Unregulated Contaminant Monitoring Rule
USEPA	United States Environmental Protection Agency
WMP	Waste Management Plan
WQP	water quality parameter

Introduction

This Site Inspection (SI) report presents the data and findings obtained from a per- and polyfluoroalkyl substances (PFAS) investigation conducted at Naval Station (NAVSTA) Everett in Everett, Washington and two associated facilities: Naval Radio Station (NRS) Jim Creek in Arlington, Washington, and Naval Recreation Complex (NRC) Pacific Beach in Pacific Beach, Washington. This report was prepared by CH2M HILL, Inc. (CH2M), a wholly owned subsidiary of Jacobs, for the Department of the Navy (Navy), Naval Facilities Engineering Systems Command Northwest, under the Comprehensive Long-term Environmental Action—Navy 9000, Contract N62470-16-D-9000, Contract Task Order N4425518F4117.

The objectives of the SI were defined in the *Final Sampling and Analysis Plan, SI for PFAS, NS Everett, Everett, Washington, NRS Jim Creek, Arlington, Washington, and NRC Pacific Beach, Pacific Beach, Washington* (SAP) (CH2M, 2022). The objectives were as follows:

- For areas identified for an SI during the Preliminary Assessment (PA), determine whether PFAS are present in groundwater and soil at concentrations warranting further investigation.
- Refine the understanding of the hydrogeologic characteristics at potential PFAS release areas identified for an SI during the PA and, for NRS Jim Creek only, evaluate the potential for PFAS migration, if present, to on- and off-installation drinking water wells.

This SI report outlines the approach taken to achieve the listed objectives, describes results and conclusions regarding data collected, and provides recommendations.

Site Backgrounds and Physical Settings

This section presents background information on NAVSTA Everett, NRS Jim Creek, and NRC Pacific Beach, including site history, potential sources of PFAS, and relevant information on the physical and hydrogeologic setting at the site.

2.1 Background

2.1.1 Naval Station Everett

NAVSTA Everett occupies approximately 117 acres in western Snohomish County adjacent to Port Gardner Bay, within the City of Everett, Washington (**Figures 2-1 and 2-2**). NAVSTA Everett was constructed in the early 1990s under the Navy's Strategic Homeport Initiative and is currently the home port for six Navy destroyers and two United States Coast Guard vessels (Navy, 2018a). The installation includes buildings and facilities that support ship operations and maintenance and provide housing and support to homeported sailors.

Before Navy acquisition, the first development of the property was around 1900, by the timber product industry. The property historically housed a sawmill, shingle mill, and other wood products manufacturing facilities (NEESA, 1992). In 1942 and 1943, the Navy purchased land at the current-day location of NAVSTA Everett for the development of the Naval Industrial Reserve Shipyard (CH2M, 2021) (**Figure 2-2**). The shipyard supported the repairing and outfitting of Navy ships and included docking facilities, drydock areas, ship building platforms, storage facilities, and fabrication and assembly facilities (including machine shop and paint shops) (CH2M, 2021). Shipyard operations ended in 1949, and the Navy continued to use the property in part to support the Military Sea Transportation Service Reserve Fleet (CH2M, 2021). Between 1947 and 1949, the Navy built a Naval Reserve Center on a portion of the Naval Industrial Reserve Shipyard property south of the current NAVSTA Everett installation boundary (Landau Associates, 1993). In 1984, the location of the former Naval Industrial Reserve Shipyard was selected as a location for the Navy's Strategic Homeport Initiative (Navy, 2018b). Through a series of property disposals and sell-offs and land acquisitions, NAVSTA Everett was developed for its current use.

During construction of NAVSTA Everett, the Navy demolished existing structures, completed cleanup activities including the excavation of petroleum hydrocarbon impacted soil, and placed a 3- to 5-foot clean fill cap over the entire property (NEESA, 1992). Building construction began in the early 1990s (NEESA, 1992) and the installation was dedicated in April 1994 (Navy, 2018b). A PA to evaluate potential releases of chemicals not including PFAS on the NAVSTA Everett property was conducted during installation improvement and construction (NEESA, 1992). Based on analytical data available at the time of the PA, it was concluded that no chemicals were detected at NAVSTA Everett at levels warranting additional actions (NEESA, 1992). However, sampling for PFAS was not conducted during this investigation.

In 2021, a PA was conducted to identify potential PFAS release areas ² at NAVSTA Everett and associated facilities, including NRS Jim Creek and NRC Pacific Beach (CH2M, 2021). The PA evaluated 22 areas at NAVSTA Everett and 1 area (Building 2114), was recommended for additional investigation (**Figure 2-2**).

Building 2114 (Fire Station)

Building 2114 (Fire Station) is in the central portion of NAVSTA Everett near the intersection of Spruance Boulevard and Fletcher Way (**Figure 2-3**). Building 2114 is the current and only fire station that has operated at NAVSTA Everett. The station was built in 1993 and is 14,082 square feet (Navy, 2018b). Five fire trucks are stationed at Building 2114. Installed foam tanks on three of these fire trucks were observed to contain aqueous film-forming foam (AFFF) during a December 2018 site visit. The fire department does not currently store AFFF

² PFAS release areas were previously referred to as PFAS source areas in the PA report (CH2M, 2021).

outside of the fire engine tanks; however, AFFF concentrate has historically been stored in Building 2114. AFFF concentrate was stored at Building 2114 in an upper-floor, ladder-access storage room; the NAVSTA Everett Fire Chief confirmed that 50 to 100 gallons of AFFF, in 5-gallon containers, was previously stored at Building 2114. (CH2M, 2021)

The PFAS PA (CH2M, 2021) identified Building 2114 as a potential PFAS release area. There were no reported spills or releases of AFFF associated with Building 2114; however, large quantities of AFFF were stored throughout its operating history as a fire station and satellite storage area. At similar facilities, firefighters historically filled the fire trucks by directly transferring AFFF from 5-gallon containers into fire trucks. Based on similar practices of AFFF transfer at other Navy installations during the same time period and the lack of available information for the handling and training practices, there is the potential for spills or leaks to have occurred during the transfer of AFFF into fire trucks. Previous environmental investigations have not been performed at Building 2114.

2.1.2 Naval Radio Station Jim Creek

NRS Jim Creek occupies approximately 3,854 acres in northern Snohomish County approximately 13 miles east of Arlington, Washington (**Figure 2-1**). NRS Jim Creek operates and maintains a communication system (Navy, 2018a). The Navy acquired land at NRS Jim Creek in 1949 and constructed the communication system and associated support facilities between 1949 and 1953 (NEESA, 1990). In addition to communication system operations, the Navy currently uses NRS Jim Creek as an outdoor recreational facility for activities such as camping, fishing, boating, hiking, and biking. Current-day buildings include a communication system, outdoor recreational facilities such as cabins and campsites, and supporting facilities.

The PFAS PA (CH2M, 2021) identified seven areas as potential PFAS release areas at NRS Jim Creek. These areas are Building 6 (Former Fire Station), Site 1 (Building 11 Landfill), Site 6 (Blue Campground Landfill), Site 7 (Pit Road Landfill), Site 4 (Metal Burial Pit), Site 5 (Mixed Waste Landfill), and the Bio Pit Disposal Area (**Figure 2-4**). Six of the seven areas were recommended for further investigation in an SI.

Building 6 (Former Fire Station)

Building 6 (Former Fire Station) is in the northwestern portion of NRS Jim Creek on the west side of Jim Creek Road (**Figure 2-5**). The former fire truck ramps are on the east side of Building 6. Building 6 is a 5,780-square-foot building built in 1952 (Navy, 2018b). Building 6 was originally an active fire station staffed by a permanent fire crew. The station was converted to a volunteer crew in the mid-1980s, and firefighting operations ceased in 1999 (CH2M, 2021).

The PFAS PA (CH2M, 2021) identified Building 6 as a potential PFAS release area. Based on historical knowledge, AFFF containers that leaked were stored at Building 6 and were rinsed off outside of Building 6. Previous environmental investigations have not been performed at Building 6.

Site 1 (Building 11 Landfill)

Site 1 (Building 11 Landfill) is in the northwestern portion of NRS Jim Creek on the west side of Building 11 (**Figure 2-6**). Site 1 is an approximately 1,000-square-foot abandoned landfill (NEESA, 1990). The area was used as an unlined landfill from the mid-1950s until 1984 when it was covered with an approximately 2-foot-thick uncompacted soil cover (NEESA, 1990). Site 1 was reportedly used for disposal of steel "bulldozer" parts, asphalt, concrete, and soil (NEESA, 1990), but this has not been confirmed.

The PFAS PA (CH2M, 2021) identified Site 1 as a potential PFAS release area. Because waste did not leave the installation prior to 1991, it is possible that AFFF containers from Building 6 were disposed of at Site 1. Site 1 was previously evaluated for potential releases of chemicals not including PFAS during the 1990 PA (NEESA, 1990) but was not recommended for further investigation at the time.

Site 6 (Blue Campground Landfill)

Site 6 (Blue Campground Landfill) is in the northern part of NRS Jim Creek on Power Line Road near the west bank of Jim Creek (**Figure 2-7**). Site 6 is an approximately 160-square-foot abandoned landfill that is believed to have been in use prior to 1976. The composition and quantity of waste disposed of at Site 6 are unknown. An approximately 2-foot-thick uncompacted soil cover was placed over Site 6 in 1984 (NEESA, 1990).

The PFAS PA (CH2M, 2021) identified Site 6 as a potential PFAS release area. Because waste did not leave the installation prior to 1991, it is possible that the AFFF containers from Building 6 were disposed of at Site 6. Site 6 was previously evaluated for potential releases of chemicals not including PFAS during the 1990 PA (NEESA, 1990) as a site that warranted further investigation at the time. The results of field activities indicated that no visible evidence of chemicals was detected at Site 6 (URS, 1991).

Site 7 (Pit Road Landfill)

Site 7 (Pit Road Landfill) is in the northern part of NRS Jim Creek along Pit Road on the west side of Jim Creek (**Figure 2-7**). Site 7 is an approximately 4,200-square-foot abandoned landfill (NEESA, 1990) that is believed to have been in use prior to 1976. In 1984 it was covered with an approximately 2-foot-thick uncompacted soil cover (NEESA, 1990). Material identified in the landfill include plastic cable casings, concrete fragments, tires, asphalt fragments, empty metal 10-gallon containers, furniture, lumber, scrap metal, and steel cable (NEESA, 1990).

The PFAS PA (CH2M, 2021) identified Site 7 as a potential PFAS release area. Because waste did not leave the installation prior to 1991, it is possible that the AFFF containers from Building 6 were disposed of at Site 7. Site 7 was previously evaluated for potential releases of chemicals not including PFAS during the 1990 PA (NEESA, 1990) but was not recommended for further investigation at the time.

Site 4 (Metal Burial Pit)

Site 4 (Metal Burial Pit) is in the northern part of NRS Jim Creek near the intersection of Hatchery Road and Jim Creek Road (**Figure 2-8**). Site 4 is an approximately 3,600-square-foot abandoned disposal area. Site 4 was an unlined natural depression that was reportedly in use prior to 1976 until 1984 when it was covered with an approximately 2-foot-thick uncompacted soil cover. The type and quantity of material disposed of at this location are unknown (NEESA, 1990).

The PFAS PA (CH2M, 2021) identified Site 4 as a potential PFAS release area. Because waste did not leave the installation prior to 1991, it is possible that the AFFF containers from Building 6 were disposed of at Site 4. Site 4 was previously evaluated for potential releases of chemicals not including PFAS during the 1990 PA (NEESA, 1990) but was not recommended for further investigation at the time.

Site 5 (Mixed Waste Landfill)

Site 5 (Mixed Waste Landfill) is in the northern part of NRS Jim Creek on the south side of Burma Road. Site 5 is an approximately 20,000-square-foot abandoned landfill (**Figure 2-8**). Site 5 was an unlined landfill historically used for the disposal of NRS Jim Creek's waste material during 1976 to 1984 when it was covered by 2-foot-thick soil cover (NEESA, 1990). While the type and quantity of material that was disposed of at this location is unknown, it is believed to include oils, greases, solvents, and paint sludges because these materials were historically generated at NRS Jim Creek in small quantities (NEESA, 1990). Empty 55-gallon drums (potentially herbicide storage containers) and electrical transformers were identified in the fill material during final cover operations in 1984 (NEESA, 1990).

The PFAS PA (CH2M, 2021) identified Site 5 as a potential PFAS release area. Because waste did not leave the installation prior to 1991, it is possible that the AFFF containers from Building 6 were disposed of at Site 5. Site 5 was previously evaluated for potential releases of chemicals not including PFAS during the 1990 PA (NEESA, 1990) as a site that warranted further investigation at the time. The results of field sampling activities indicated no chemicals were detected at Site 5 at levels warranting additional actions (URS, 1991). However, sampling for PFAS was not conducted during this investigation.

Bio Pit Disposal Area

The "Bio Pit" Disposal Area at NRS Jim Creek (**Figure 2-7**) is an active disposal area for grass clippings and other plant debris. Initial timeframe of use of this area for disposal is unknown. Sludge removed from stormwater catch basins at NRS Jim Creek is also disposed in this area (CH2M, 2021).

The PFAS PA (CH2M, 2021) identified the Bio Pit Disposal Area as a potential PFAS release area but the area was recommended for no further investigation. The Bio Pit Disposal Area was to be investigated only if SI results indicate that the catch basin near Building 6 has been impacted by PFAS and there was evidence that PFAS-containing vegetative debris or sediment was transported to the Bio Pit Disposal Area (**Figure 2-5**).

2.1.3 Naval Recreation Complex Pacific Beach

NRC Pacific Beach occupies approximately 53 acres in western Grays Harbor County adjacent to the Pacific Ocean approximately 36 miles northwest of Aberdeen, Washington (**Figure 2-1**). The installation was initially developed by the Navy at the start of World War II as a communications center and range for training purposes (NEESA, 1991). By 1956, the Navy moved training operations closer to Puget Sound and Seattle. Defense equipment and associated infrastructure, such as gun mounts, ammunition magazines, and related buildings, were demolished and replaced with more conventional structures (NEESA, 1991). By the late 1970s, military housing was no longer required, and the installation was converted into a recreational facility with single-family homes and dormitory-type buildings. In 1984, a 1-acre recreational vehicle and motor home park was built along the northern boundary of the installation and exists to this day. There are currently no active military operations at NRC Pacific Beach.

The PFAS PA (CH2M, 2021) identified one area at NRC Pacific Beach as a potential PFAS release area, and the area was recommended for further investigation in an SI. This area is Building 106 (Former Fire Station) (Figure 2-9).

Building 106 (Former Fire Station)

Building 106 (Former Fire Station) is in the east-central part of NRC Pacific Beach along 1st Street North (**Figure 2-10**). Building 106 is a 3,929-square-foot building built in 1958 (Navy, 2018b) and was originally constructed as part of the Sound Surveillance System (SOSUS) facilities and served as the Boiler Plant, Garage, and Fire Station. Building 106 is no longer a functioning fire station and is now used as a recycling center and for storage and maintenance of grounds keeping equipment and some flammable storage (CH2M, 2021). It is presumed that Building 106 was operational as a fire station soon after it was constructed in 1958. The SOSUS facility at NRC Pacific Beach was decommissioned in 1987; most of the facility, including Building 106, was turned over to NAVSTA Everett for management at that time (NAVFAC, 2017).

The PFAS PA (CH2M, 2021) identified Building 106 as a potential PFAS release area. There was no known storage, use, or release of AFFF at this site. However, the operational timeframe of Building 106 as a fire station, from the late 1950s through the 1980s, overlaps with the timeframe in which AFFF has been in use by the Navy. If AFFF transfer or washing of fire trucks occurred on fire truck ramps east and west of Building 106, AFFF or AFFF residual could have been splashed or washed onto the pavement and migrated to nearby unpaved areas with overland drainage. Previous environmental investigations have not been performed at Building 2114.

2.2 Environmental Setting

This section provides the environmental setting of NAVSTA Everett, NRS Jim Creek, and NRC Pacific Beach.

2.2.1 Climate

The climate near NAVSTA Everett and NRS Jim Creek is characterized by cool, dry summers, and wet, cool winters (NEESA, 1984). Average high temperatures during the summer months range from 65 to 80 degrees Fahrenheit (°F), while winter highs are typically in the 40°F range (Weatherbase, 2019a). Average annual precipitation is

approximately 36 inches, approximately three-fourths of which falls between October and April. The Everett area receives approximately 7 inches of snowfall annually (Weatherbase, 2019b).

The climate at NRC Pacific Beach is characterized by, cool, dry summers and mild winters. Based on available data for Taholah, Washington, approximately 10 miles north on the coast and the closest area with historical weather data, average temperatures during the summer months range from 50 to 60°F, with winter temperatures ranging from 35 to 50°F. The average annual precipitation is approximately 88 inches, with the greatest amount of precipitation falling in November through February. The area receives approximately 3 inches of snow per year (Weatherbase, 2023).

2.2.2 Topography and Hydrologic Setting

Naval Station Everett

Marine or brackish water bodies on and near the site include Port Gardner Bay and East Waterway. The East Waterway is south of NAVSTA Everett and flows into Port Gardner Bay which is an inlet of Possession Sound (**Figure 2-2**). Port Gardner Bay and Possession Sound are part of Puget Sound. The Snohomish River discharges into Port Gardner Bay through a channel between the mainland including the western boundary of NAVSTA Everett and Jetty Island (**Figure 2-2**). The overall surface water flow direction at NAVSTA Everett is to the west toward the Snohomish River and Port Gardner Bay (**Figure 2-2**).

Much of NAVSTA Everett is covered in low-permeability surfaces (extensive paved areas and low-permeability soil) with stormwater infrastructure to capture and control surface water. Stormwater catchments collect and divert water to Puget Sound (NEESA, 1992).

Naval Radio Station Jim Creek

The primary water bodies at or near NRS Jim Creek are Jim Creek, Little Jim Creek, Big Jim Creek, and Cub Creek (**Figure 2-4**). Jim Creek flows northwesterly through the installation. Little Jim Creek and Big Jim Creek flow into Jim Creek near the eastern boundary of the installation. The on-Base reach of Cub Creek begins at the southwestern boundary of NRS Jim Creek in a wetland area south of Twin Lakes. From Twin Lakes, Cub Creek flows north to Cub Creek Reservoir and then into Jim Creek (Malcolm Pirnie, 2006). Jim Creek and Cub Creek are fed by numerous small spring and snow-fed streams (NEESA, 1990).

Naval Recreation Complex Pacific Beach

There are no perennial streams, lakes or other surface water bodies at NRC Pacific Beach (**Figure 2-9**). The nearest major freshwater body is Joe Creek, which empties to the Pacific Ocean approximately half a mile to the south. Surface runoff is drained west toward the Pacific Ocean along two ravines referred to as the Northern and Southern Drainage Ravines. The poor drainage of the soil has contributed to the slope destabilization as subsurface flow is concentrated in the porous soil layers and finer material is gradually washed away. As a result, slope failure has been and continues to be a problem at Pacific Beach (NAVFAC, 2017).

2.2.3 Geologic Setting

Naval Station Everett

Everett is in the Puget Lowland, a large structural trough between the Cascade Range and the Olympic Mountains. The site vicinity is bounded by active fault zones in the Everett Basin. The geology of the region surrounding NAVSTA Everett is the result of glaciation. The most recent glacial action occurred between 15,000 and 13,500 years ago during the Vashon State of the Fraser Glaciation (URS, 1992a).

NAVSTA Everett is within the historic tidal zone of the East Waterway (**Figure 2-2**). The geologic setting of NAVSTA Everett has been altered by import and placement of dredged and fill materials from the East Waterway, demolition and woody debris from former sawmill operations, and hydraulic fill from the Snohomish River channel (NEESA, 1992; AECOM, 2011). Fill material thickness ranges from 20 to 27 feet below ground surface (bgs)

(AECOM, 2011). Native soils beneath the fill consist of marine and deltaic sediments extending to depths in excess of 180 feet.

Beneath the fill and native soils are Pleistocene glacial outwash deposits and till deposits. Outwash sediments consist of well-bedded fine to medium sands and gravel with occasional silt lenses. Till sediments consist of compact, unsorted sand, gravel, and cobbles in a matrix of silt and clay. East of NAVSTA Everett, Holocene fluvial sands and gravels cut into the glacial sediments. Tertiary bedrock underlies the glacial and fluvial sediments. The average depth to bedrock in western Snohomish County is about 500 feet, but it can be more than 1,200 feet near the Puget Sound coastline (Thomas et al., 1997).

Naval Radio Station Jim Creek

NRS Jim Creek is within a U-shaped valley that trends northwest-southeast (**Figure 2-4**). The valley is bordered by Ebey Hill to the northwest, Wheeler Mountain to the northeast, and Blue Mountain to the southwest (TEC, 2001). The geomorphology of the valley is the result of Pleistocene glacial activity. Bedrock is composed of metamorphic and igneous rocks, including slate, phyllite, and graywacke (TEC, 2001). Cross sections of nearby areas to the north and south of NRS Jim Creek indicate that maximum depth to bedrock is 300 feet (Thomas et al., 1997). Valley fill sediments consist of talus, glacial moraine, landslide debris, and alluvial sand and gravel deposits with interbedded silt and clay. Landslides are common because of the low soil stability that is due in part to the presence of glacial sediments. However, there is no evidence of large-scale seismic activity (Malcolm Pirnie, 2006).

Naval Recreation Complex Pacific Beach

NRC Pacific Beach is at the northernmost extent of the Willapa Hills physiographic province of southwestern Washington (**Figure 2-9**). The basement rocks of the Willapa Hills are composed mainly of Eocene to Miocene pillow basalts and oceanic sedimentary rocks that accreted onto North America. Unconsolidated Pliocene and Pleistocene costal sediments and glacial debris overlay the basement rocks (PWCSD, 1996). The Pacific Beach Annex is situated on a bluff comprised of silty glaciolacustrine sediments overlying glacial outwash plains (NAVFAC, 2017). The stratigraphy of the subsurface consists of an organic-rich surface layer approximately 1 to 2 feet thick underlain by alternating layers of silt/clay and sand/gravel, which continue to a few 100 feet bgs. Because of development at the site, much of the topsoil has been removed and replaced with sandy gravel fill (URS, 1992b; Foster Wheeler, 1997). During the installation of new monitoring wells for this investigation, sand or gravel with silt was observed in the upper 5 to 10 feet underlain by primary sand/gravel with some clay/silt.

2.2.4 Hydrogeologic Setting

Naval Station Everett

Available hydrogeologic information for the immediate vicinity of NAVSTA Everett is minimal; however, United States Geological Survey published a general study of the regional hydrogeology of western Snohomish County (Thomas et al., 1997). The Pleistocene and Holocene sediments in western Snohomish County are classified into six hydrostratigraphic units consisting of four aquifers and two confining units:

- Alluvium aquifer (Qal) Unconfined, 40 to 120 feet thick where present. Qal consists of fine to coarse sands with lenses of silt and gravel. Qal is often vertically contiguous and hydraulically connected with other lower aquifer units. In such cases, multiple aquifer units function as one aquifer rather than independent aquifers. Qal does not appear to be prominent locally at NAVSTA Everett.
- Vashon recessional outwash aquifer (Qvr) Unconfined, 40 to 250 feet thick where present. Qvr consists of well sorted sand and gravel with minor silt beds. Qvr does not appear to be prominent locally at NAVSTA Everett.
- The Vashon till confining unit (Qvt) 70 to 250 feet thick. Qvt consists of unsorted sand, gravel, and boulders in a silt and clay matrix with some lenses of sand and gravel.

- Vashon advance outwash aquifer (Qva) 120 to 350 feet thick. Qva consists of fine sand and gravel with some silt lenses. Qva is the source of most potable groundwater supply in the area and is the most aerially extensive aquifer unit.
- Transitional beds confining unit (Qtb) 100 to 400 feet thick. Laminated sand and silty clay. Although Qtb is classified as a confining unit, it can yield usable amounts of water.
- Undifferentiated sediments aquifer (Qu) 500 to 1,000 feet thick. Qu is not well defined, but generally consists of coarse-grained materials.
- Bedrock confining unit (Tb) Although Tb is classified as a confining bed, it can yield small amounts of water from fractures and joints.

Based on previous reports and the 2022 SI data, depth to groundwater at NAVSTA Everett is tidally influenced and ranges from 5.5 to 14 feet bgs (NEESA, 1992). Groundwater generally flows toward the Snohomish River channel and Port Gardner Bay (URS, 1993). Shallow groundwater flow is influenced by the consistency of the fill materials (URS, 1993). Shallow lithology encountered during the SI is shown in **Table 4-1** and in **Appendix B**. Based on this investigation, groundwater in the unconfined aquifer is confirmed to flow west toward the Snohomish River channel (**Figure 2-2**).

Naval Radio Station Jim Creek

Available site-specific hydrogeologic information for NRS Jim Creek does not mention specific regionally recognized hydrostratigraphic units; however, cross sections of nearby areas to the north and south of NRS Jim Creek indicate that several hydrogeologic units present at NRS Jim Creek, including the Qal aquifer, Qvr aquifer, Qvt confining unit, the Qva aquifer, and the Tb confining unit (Thomas et al., 1997), are likely present near Jim Creek.

Water bearing formations near NRS Jim Creek are considered highly permeable and consist of coarse to medium sands (NEESA, 1990). Shallow groundwater is found at approximate depths ranging from 4.5 to 20 feet bgs (TEC, 2001). The shallow groundwater is in hydraulic communication with Jim Creek and other surface water bodies (TEC, 2001). Lithology from boring logs of wells near NRS Jim Creek indicate the presence of three hydrostratigraphic units described as follows:

- Upper aquifer Silty sand with some gravel generally between 0 and 30 feet thick along the valley floor but can be over 250 feet thick in elevated areas above the valley floor. These soils likely represent the Qal and Qvr aquifer units.
- Middle confining unit Silt and clay up to 100 feet thick. These soils likely represent the Qvt confining unit.
- Lower aquifer Fine sand with some silt and gravel. These soils likely represent the Qva aquifer.

The shallow groundwater gradient is assumed to mimic topography and flow toward one of the three primary perennial streams that exist at NRS Jim Creek: Jim Creek, Little Jim Creek, or Cub Creek (**Figure 2-4**). Site-specific groundwater elevations collected during this SI across the seven sites at the installation generally supports this flow system. The groundwater flow direction in the developed northwest portion of NRS Jim Creek is to the northwest and west toward Jim Creek (**Figure 2-4**). Based on the 2022 SI data, depth to groundwater at NRS Jim Creek ranges from 4 to 240 feet bgs, and water level measurements collected at each site support the flow directions indicated above. Site-specific lithology and hydrogeology are presented in **Tables 4-2** through **4-7** and Appendix B. During the wet season (November through May), perched groundwater can be found above a hardpan layer that is present between 20 and 40 inches bgs (Malcolm Pirnie, 2006). A deeper aquifer is present below depths of approximately 114 feet bgs (Malcolm Pirnie, 2006). Information is not available on groundwater flow directions in the deeper aquifer.

Naval Recreation Complex Pacific Beach

The glacial soils at Pacific Beach are poorly drained resulting in a water table that is relatively high (URS, 1992a). During the wet season (October to May), the water table can range from 6 inches deep to above the surface

SITE INSPECTION REPORT FOR PER- AND POLYFLUOROALKYL SUBSTANCES NAVAL STATION EVERETT, EVERETT, WASHINGTON, NAVAL RADIO STATION JIM CREEK, ARLINGTON, WASHINGTON, AND NAVAL RECREATION COMPLEX PACIFIC BEACH, PACIFIC BEACH, WASHINGTON

(URS, 1992b). Some evidence exists indicating this high water table may actually represent seasonal perched water rather than the regional water table; some investigations at the site did not encounter groundwater until below 14 feet in depth (PWCSD, 1996). A shallow aquifer is present between 10 and 25 feet below the surface, and several monitoring wells are screened within this interval. Static water levels at these wells indicate that water table is between 10 and 15 feet bgs and that the groundwater flow direction is to the west toward the Pacific Ocean (**Figure 2-9**) (Foster Wheeler, 1997). Historically, two on-Base water supply wells (now decommissioned) were both screened from 163 to 168 feet deep (NEESA, 1991; Lukjanowicz, 1984), which indicates the presence of at least one deeper aquifer. However, additional information on deeper aquifers was not available. Based on the 2022 SI data, depth to groundwater at NRC Pacific Beach is approximately 12 to 13 feet bgs. Site-specific lithology and hydrogeology are presented in **Table 4-8** and **Appendix B**.

2.3 On-Base and Off-Base Drinking Water Source Evaluation

This section discusses the sources of drinking water at the installation and in the adjacent off-Base areas and whether on-Base or off-Base drinking water could have been impacted by the potential PFAS release areas investigated as part of the SI.

2.3.1 Naval Station Everett

- Public Drinking Water Sources On-Base drinking water at NAVSTA Everett is supplied by the City of Everett. The City of Everett's water supply source is Spada Lake Reservoir that is approximately 25 miles east of NAVSTA Everett. One public water supply well was confirmed to have been abandoned. No active public supply wells are identified within 1 mile of the installation boundary. PFAS were not detected in the City of Everett's drinking water. Therefore, there are no known PFAS exposure pathways to human receptors through public drinking water sources.
- Private Drinking Water Sources Based on data obtained from the Washington State Department of Ecology (Ecology) (2018) and Washington State Department of Health (DOH), several wells may exist within 1 mile to the north-northeast and south of NAVSTA Everett; however, the exact number of wells and their locations, current operational status (active or abandoned), depth, and usage are not well documented. Some of these wells are suspected to be monitoring wells because of depth, location, and Navy contractor affiliation. During visual reconnaissance of the approximate monitoring well locations and the general Everett area, no drinking water or groundwater monitoring wells were observed. Because potential private drinking water wells are not located downgradient of PFAS release areas, exposure to PFAS in groundwater used as drinking water is unlikely.

2.3.2 Naval Radio Station Jim Creek

- Public Drinking Water Sources Drinking water at NRS Jim Creek is supplied by an on-Base water supply well that is centrally located. The total depth of the well is approximately 126 feet bgs and is screened from 116 to 126 feet bgs in the lower aquifer unit. The well is not downgradient of potential PFAS release areas. The well was sampled for PFAS in November 2020, and perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) were not detected. Based on available information (Ecology/DOH, 2018), no public drinking water sources are within a 1-mile radius of NRS Jim Creek.
- **Private Drinking Water Sources** Based on data obtained from Ecology (2018) and DOH, at least nine private drinking water wells (total depths ranging from 25 to 320 feet bgs) are within 1 mile of NRS Jim Creek, north/northwest of NRS Jim Creek. Groundwater in the northwestern portion of NRS Jim Creek flows to the northwest and west toward Jim Creek, while Jim Creek flows to the west away from the northwest corner of the installation, and away from these wells. Shallow groundwater is assumed to mimic topography and flow toward one of primary surface water bodies at NRS Jim Creek. As stated in **Section 2.2.4** based on regional stratigraphy, evidence of a middle confining unit of silt and clay are present at a depth of 100 feet, separating

the shallow and deeper aquifers. Therefore, vertical migration of PFAS constituents to the deeper regional aquifer is unlikely. Transport via surface water of PFAS to downstream off-Base human receptors, if present in Jim Creek, is possible. Because the identified private drinking water wells are north of NRS Jim Creek and Jim Creek flows west from the northwest corner of NRS Jim Creek, exposure to PFAS in groundwater used as drinking water is unlikely.

2.3.3 Naval Recreation Complex Pacific Beach

- Public Drinking Water Sources Drinking water at NRC Pacific Beach is supplied by the Grays Harbor County Pacific Beach Water System (Gibbs & Olson, 2016). NRC Pacific Beach drinking water was sampled for PFAS in September 2016, and PFOS and PFOA were not detected. The source of the Grays Harbor Pacific Beach Water system consists of three production wells, which are within 1 mile of the installation boundary to the east. These wells are screened at depths ranging from 166 to 222.5 feet bgs (Gibbs & Olson, 2016). The three wells are upgradient of NRC Pacific Beach. Other public drinking water sources were not identified within 1 mile of the installation boundary. Because the identified public drinking water wells are upgradient, exposure to PFAS in groundwater used as drinking water is unlikely.
- **Private Drinking Water Sources** Based on data obtained from the Ecology (2018) and DOH, no private drinking water wells exist within 1 mile of NRC Pacific Beach. Therefore, there are no known PFAS exposure pathways to human receptors through private drinking water sources.



LEGEND

 Installation Location 	NOTES: NRC = Naval Recreation Complex
City	NAVSTA = Naval Station
Freeway	NRS = Naval Radio Station
 State Route 	PFAS = Per- and polyfluoroalkyl substances
	IMAGERY SOURCE:
	ESRI ArcGIS Online Web Service,

World Imagery, 2022

Figure 2-1 Installation Locations Site Inspection for PFAS NAVSTA Everett, NRS Jim Creek, NRC Pacific Beach, Washington





Easements granted to the Navy/United States not shown. IMAGERY SOURCE: ESRI ArcGIS Online Web Service,

World Imagery, Maxar, 2022

425 Feet 1 inch = 850 feet

NRC Pacific Beach, Washington

850

Ν





- Important Local Road
- 5' Topographic Contours Potential PFAS Release Area
- Installation Boundary

NAVSTA Everett, NRS Jim Creek, NRC Pacific Beach, Washington 150 75



Ν



Potential PFAS Release Area Potential PFAS Release Area (No Further Action Determination Deferred in Preliminary Assessment) Installation Boundary

NAVSTA Everett, NRS Jim Creek, NRC Pacific Beach, Washington





LEGEND

- Monitoring Well and •
- Soil Sample Location
- Stormwater Catch Basin Groundwater Flow Direction
- Anticipated Overland
 - Water Flow Direction
- Unpaved Ditch
- - 5' Topographic Contours

Figure 2-5 Surface Waterbodies Potential PFAS Release Area Site Layout and Sampling Locations: NRS Jim Creek, Building 6 Site Inspection for PFAS Installation Boundary NAVSTA Everett, NRS Jim Creek,







- Groundwater Flow Direction
- Anticipated Overland Water Flow Direction -
- Unpaved Ditch _
- 5' Topographic Contours
 - Surface Waterbodies

- Installation Boundary

Site Inspection for PFAS NAVSTA Everett, NRS Jim Creek, NRC Pacific Beach, Washington 75 150

1 inch = 150 feet

N





LEGEND

- Monitoring Well and Soil Sample Location
 Groundwater Flow Direction
- Anticipated Overland Water Flow Direction
 Surface Waterbodies
- 5' Topographic Contours
- Potential PFAS Release Area (assumed boundary)



Figure 2-7 Site Layout and Sampling Locations: NRS Jim Creek, Sites 6 and 7 Site Inspection for PFAS NAVSTA Everett, NRS Jim Creek, NRC Pacific Beach, Washington

1 inch = 150 feet

N

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LEGEND

- Monitoring Well and Soil Sampling Location
- Shallow Subsurface Soil Sample Location
- Groundwater Flow Direction
- Anticipated Overland Water Flow Direction
- 5' Topographic Contours
- Surface Waterbodies
- Potential PFAS Release Area (assumed boundary)
- Installation Boundary

NOTES:

NRC = Naval Recreation Complex NAVSTA = Naval Station NRS = Naval Radio Station PFAS = Per- and polyfluoroalkyl substances Contours derived from USGS National Elevation Dataset.

IMAGERY SOURCE: ESRI ArcGIS Online Web Service, World Imagery, Maxar, 2021

Figure 2-8 Site Layout and Sampling Locations: NRS Jim Creek, Sites 4 and 5 Site Inspection for PFAS NAVSTA Everett, NRS Jim Creek,

NRC Pacific Beach, Washington





LEGEND

Major Road Surface Waterbodies Groundwater Flow Direction Anticipated Overland Water Flow Direction Potential PFAS Release Area Installation Boundary i

Potential PFAS Release Areas: NRC Pacific Beach Site Inspection for PFAS NAVSTA Everett, NRS Jim Creek, NRC Pacific Beach, Washington





LEGEND

•	Monitoring Well and Soil Sample Location			
	Important Local Road			
\rightarrow	Groundwater Flow Direction			
->	Anticipated Overland Water Flow Direction			
	Surface Waterbodies			
	20' Topographic Contours			
	Potential PFAS Release Area			
	Installation Boundary			

Site Layout and Sampling Locations: NRC Pacific Beach, Building 106 Site Inspection for PFAS NAVSTA Everett, NRS Jim Creek, NRC Pacific Beach, Washington



Field Investigation Methodology

This section describes the field activities, which were performed in accordance with the SAP (CH2M, 2022) except where noted. Field activities were conducted in multiple mobilizations from May 2022 to March 2023 and included site reconnaissance preparation, utility clearance, drilling and installation of monitoring wells, soil sampling, monitoring well sampling, synoptic groundwater elevation measurements, and investigation-derived waste (IDW) removal. Field notes are provided in **Appendix A**.

3.1 Site Preparation and Utility Clearance

Prior to intrusive investigation activities, a third-party utility clearance subcontractor clearly marked subsurface utilities with spray paint near proposed boring locations. Subsurface utilities were marked within 5 feet of the proposed boring locations. In addition, utility locate tickets were submitted to Washington 811 and private and state entities marked their respective utilities near the proposed drilling locations. Conductive and nonconductive utility locate techniques were applied to mark all utilities present.

3.2 Archaeological Monitoring

Five discontiguous Areas of Potential Effect (APEs) at NRS Jim Creek were identified for SI activities. Limited cultural resource investigations have been completed within NRS Jim Creek, and the five discontiguous APEs are along or near streams that are considered to have a moderate to high potential for buried archaeological deposits. Given these factors, archaeological monitoring was conducted by a CH2M professional archaeologist for ground disturbing activities at the SI locations within the five discontiguous APEs. Archaeological monitoring at Jim Creek followed the methods, protocols, and guidance described in the NAVSTA Everett Inadvertent Discovery Plan. Archaeological resources or evidence of buried resources were not encountered during archaeological monitoring of SI activities.

3.3 Monitoring Well Installation

Three monitoring wells were constructed at NAVSTA Everett at Building 2114 (Fire Station). Eighteen monitoring wells were constructed at NRS Jim Creek: four at Building 6 (Former Fire Station), three at Site 1 (Building 11 Landfill), three at Site 6 (Blue Campground Landfill), three at Site 7 (Pit Road Landfill), two at Site 4 (Metal Burial Pit), and three at Site 5 (Mixed Waste Landfill). Three monitoring wells were constructed at NRC Pacific Beach at Building 106 (Former Fire Station). The monitoring wells were installed in accordance with the State of Washington well construction standards by a Washington-licensed driller. Well construction reports were submitted to Ecology following construction. Borehole advancement was conducted using a rotosonic drill rig, and continuous soil cores were extruded and collected in plastic sleeves and logged for lithology. Borehole advancement and soil logging were conducted in accordance with the SAP (CH2M, 2022). The locations of the monitoring wells installed are shown on **Figures 3-1** through **3-6**.

Most of the monitoring wells were constructed with 2-inch-inside-diameter Schedule (SCH) 40 polyvinyl chloride (PVC) risers connected to 2-inch inside diameter factory slotted 0.020-inch SCH 40 PVC screen with a bottom cap. NRSJC-S7-MW11, NRSJC-S7-MW12, and NRSJC-S7-MW13 were constructed with 2-inch-inside-diameter SCH 80 PVC risers connected to 2-inch-inside-diameter factory slotted 0.020-inch SCH 80 PVC screen with a bottom cap; additional information on this deviation is provided in **Section 3.13**. SCH 80 PVC was selected due to the greater depth and pressure on these three wells (greater than 200 feet bgs) compared to other wells installed. The depth of the screened intervals varied at each well to screen across the groundwater table, as described in the SAP (CH2M, 2022). Monitoring wells were constructed with 10-foot screens except for monitoring wells NRSJC-S7-MW11 and NRSJC-S7-MW13, which were installed with a 20-foot screened interval. The annular space between the borehole wall and well screen was backfilled with a 2/12 silica sand filter pack placed around the annular space of the well screen extending from the bottom of the boring to a minimum height of 2 feet above the top of

SITE INSPECTION REPORT FOR PER- AND POLYFLUOROALKYL SUBSTANCES NAVAL STATION EVERETT, EVERETT, WASHINGTON, NAVAL RADIO STATION JIM CREEK, ARLINGTON, WASHINGTON, AND NAVAL RECREATION COMPLEX PACIFIC BEACH, PACIFIC BEACH, WASHINGTON

the well screen. For wells screened from 4 to 14 feet bgs (NRSJC-S6-MW-05, NRSJC-S6-MW-07, NRSJC-S6-MW-08, and NRSJC-S6-MW-09), the filter pack sand was placed to only 1 to 1.5 feet above the top of the well screen due to limited available annular space above the screened interval to emplace the sanitary seal. A bentonite seal, at least 2 feet thick, was placed above the top of the sand pack, except for wells NRSJC-S6-MW-08 and NRSJC-S6-MW-09 where the seal was only 1.5 feet thick due to limited depth. After the bentonite had been hydrated, either a cement-bentonite grout or neat cement was placed in the remaining annular space. Well heads were completed as flush-mount manholes or stick-up wells. Monitoring well construction information is provided in **Table 3-1**. Well completion diagrams are provided in **Appendix B**.

To avoid introducing PFAS during the well installation process, drill tooling and well development equipment did not have PFAS-containing components (such as parts or o-rings containing Teflon, Viton, polytetrafluoroethylene and all other fluorinated compounds). In addition, thread lubricant used on the drilling tools and well materials (such as riser, screen, sand, and grout) did not contain polytetrafluoroethylene or other fluorine-containing substance. Coated bentonite pellets were not used to avoid possible introduction of PFAS.

3.4 Monitoring Well Development

After completion of the well installation, each newly installed monitoring well was developed by the drilling subcontractor using a combination of surging, bailing, and pumping. Development did not begin until at least 24 hours after cement or bentonite installation. During monitoring well development, the CH2M field personnel measured water quality parameters (WQPs), including pH, temperature, conductivity, and turbidity with a water quality meter. Development continued until turbidity was below 10 nephelometric turbidity units (NTUs) or at least three well volumes of groundwater were removed.

Development information, including turbidity, pH, specific conductivity, temperature, and gallons of water removed, were recorded as field notes. In addition, the water quality meter was calibrated daily (at a minimum). Well development logs are provided in **Appendix C**. Surge blocks, bailers, and pumps used during development did not contain PFAS.

3.5 Groundwater Level Measurements

A synoptic groundwater elevation survey was conducted at newly installed monitoring wells using a water level indicator. The survey was conducted on August 9, 2022, at NRC Pacific Beach, on August 11, 2022, at NAVSTA Everett, and on December 15, 2022, at NRS Jim Creek, more than 24 hours after well installation and development had been completed. Water levels were remeasured at Building 6 wells on March 1, 2023, to reevaluate groundwater contours that suggested groundwater flows north-northwest based on the December 2022 data. The March 2023 data suggest that groundwater flow at the site is to the west, which is consistent with the anticipated flow direction toward nearby Jim Creek and align more closely with the topographic slope near Building 6. An accurate water level measurement and groundwater sample could not be collected at NRSJC-S7-MW-13 due to insufficient water in the well casing. Depth to water was measured from the top of the PVC riser and recorded to the nearest 0.01 foot. Potentiometric surface maps are presented on **Figures 3-1** through **3-6**. Synoptic groundwater elevations are presented in **Table 3-2**. As shown on **Figure 3-4**, a potentiometric surface map could not be produced using well data from Site 7 due to the lack of a third congruent water level measurement.

3.6 Groundwater Sampling

Groundwater samples were collected from the 23 newly installed monitoring wells under low flow/low stress conditions with a PFAS-free bladder pump, peristaltic pump, or bailer constructed of high-density polyethylene (HDPE). The pump intake was placed at the middle of the well screen interval. Prior to collecting the sample, depth-to-water readings and WQPs were measured and recorded (approximately every 5 minutes) using a depth-to-water meter and water quality meter, which was calibrated daily (at a minimum). For samples collected using a

bailer, either one round of parameters was collected immediately before sampling, or readings were not collected. No sample was collected at NRSJC-S7-MW-13 due to insufficient water in the well casing. Sampling began when three well volumes had been purged or when minimal water level drawdown requirements were met (less than 0.33 foot), and WQPs had stabilized for three consecutive readings in accordance with the SAP (CH2M, 2022), as follows:

- Temperature within 3 percent
- pH within 0.1 pH unit
- Conductivity within 3 percent
- Dissolved oxygen within 10 percent for values greater than 0.5 milligram per liter; if three DO values are less than 0.5 milligram per liter, consider the values stabilized
- Oxidation-reduction potential within 10 millivolts
- Turbidity measurements are less than 5 NTU; if three turbidity values are less than 5 NTU, consider the values stabilized

Once met, depth to water, WQPs, and total well depth measurements were recorded; groundwater sampling data sheets are provided in **Appendix D** and field parameters are presented in **Table 3-3**.

Groundwater was collected in laboratory-supplied HDPE bottles and placed into coolers containing enough ice to keep the samples 0 to 6°C (but not frozen) until they were received by the laboratory. Field quality assurance (QA) and quality control (QC) samples and frequencies are discussed in **Section 3.8**.

To avoid introducing PFAS during groundwater sampling, PFAS-containing equipment and components were not used. The use of PFAS-containing clothing and sunscreen, insect repellant, and other personal hygiene products that may contain PFAS were avoided. Sample tubing was HDPE.

3.7 Soil Sampling

Soil samples were collected at the surface (0 to 1 foot bgs) or near surface if there was nonnative material present (1 to 5 feet bgs) and within the capillary fringe at the 24 newly installed monitoring well boring locations and 2 soil boring-only locations (**Figures 3-1** through **3-6**). Subsurface soil samples were collected within the capillary fringe where lithologic conditions allowed. Additional soil samples were collected at NRSJC-S7-MW-11, NRSJC-S7-MW-12, and NRSJC-S7-MW-13 at approximately every 50 feet until groundwater was encountered. The following are subsurface soil sample depth ranges:

- NAVSTA Everett Building 2114: 9-10 feet bgs to 19-20 feet bgs
- NRS Jim Creek Building 6: 27-28 feet bgs to 36-37 feet bgs
- NRS Jim Creek Site 1: 3-4 feet bgs to 25-26 feet bgs
- NRS Jim Creek Site 6: 3.5-4 feet bgs to 14-15 feet bgs
- NRS Jim Creek Site 7: 38-39 feet bgs to 231-232 feet bgs
- NRS Jim Creek Site 4: 3.5-5 feet bgs to 17-18 feet bgs
- NRS Jim Creek Site 5: 7-8 feet bgs to 14-15 feet bgs
- NRC Pacific Beach Building 106: 5-6 feet bgs to 13-14 feet bgs

Surface samples were collected from a stainless-steel hand auger with 4-inch-inside-diameter basket or stainlesssteel hand trowel, and subsurface soil samples were collected from the extruded soil core recovered from the sonic tooling in PFAS-free 4-inch core bags.

Soil was collected in laboratory-supplied HDPE jars using single-use dedicated equipment. Soil samples were placed into coolers containing enough ice to keep the samples 0 to 6°C (but not frozen) until they were received by the laboratory. Field QA/QC samples and frequencies are discussed in **Section 3.8**.

3.8 Quality Assurance and Quality Control

To avoid introducing PFAS during soil sampling, PFAS-containing equipment and components were not used. The use of PFAS-containing clothing and sunscreen, insect repellant, and other personal hygiene products that may contain PFAS were avoided.

Field QA/QC samples were collected during sampling, in accordance with the SAP (CH2M, 2022). Field QA/QC samples were used to:

- Confirm that disposable and reusable sampling equipment were free of PFAS.
- Evaluate field methodology.
- Establish ambient field background conditions.
- Evaluate whether cross-contamination occurred during sampling and/or shipping.

Field QA/QC samples were collected as follows:

- Equipment rinsate blank samples were collected from decontaminated sampling equipment during soil and groundwater sampling. Eighteen equipment blanks were collected during sampling.
- Field blank samples were collected at each investigation area during sampling at each SI investigation area. Eighteen field blanks were collected during sampling.
- Field duplicate samples were collected at the frequency of one per 10 normal field samples of similar matrix. Fifteen field duplicate samples were collected during sampling.
- Matrix spike (MS) and matrix spike duplicate (MSD) samples were collected for every 20 environmental samples collected (or greater than or equal to 5 percent of the samples collected) per medium, including field duplicates. Fourteen MS/MSD samples were collected during sampling.

3.9 Sample Packaging and Shipping

Samples were stored in coolers on ice following collection with a corresponding chain-of-custody. Coolers were then managed, secured, and shipped on ice via FedEx to Battelle Norwell Operations, Norwell, Massachusetts for analysis. During shipment, precautions were taken to monitor and track the shipments and coordinate arrival with the lab.

3.10 Decontamination Procedures

Decontamination activities including decontaminating nondisposable equipment were conducted in accordance with the standard operating procedures (SOPs) provided in the SAP (CH2M, 2022).

Water generated while decontaminating sampling equipment was collected and disposed as IDW as described in **Section 3.12**. Disposable sampling equipment and personal protective equipment, such as HDPE tubing and nitrile gloves, were also disposed of as IDW.

Reusable heavy equipment, such as drilling rods and augers, were decontaminated before and after the collecting each sample. The fluid generated was disposed as IDW. Heavy equipment decontamination procedures were conducted in accordance with the Decontamination of Drilling Rigs and Equipment SOP provided in the SAP (CH2M, 2022).

3.11 Surveying

Newly installed permanent monitoring well locations were horizontally and vertically located by a Washingtonlicensed surveyor in January 2023. The surveyor provided coordinates of horizontal points X, Y, to the nearest 0.5 foot and vertical point Z to the nearest 0.01 foot (0.1 foot for unpaved ground surface elevations). The survey report is provided as **Appendix E**.

3.12 Investigation-derived Waste Management

IDW generated during the SI included drill cuttings generated during monitoring well installations, purge water from well development and groundwater sampling, decontamination fluids, disposable sampling equipment, and personal protective equipment. At NAVSTA Everett, solid IDW was contained in four 55-gallon drums, and aqueous IDW was containerized into three new 275-gallon United States Department of Transportation-approved intermediate bulk container totes. Containers were properly sealed, labeled, and staged within a Navy-approved staging area within the parking lot south of Building 2114 (Fire Station). At NRS Jim Creek, solid IDW was contained in two 20-yard roll off dumpsters, and aqueous IDW was containerized into three new 275-gallon United States Department of Transportation-approved intermediate bulk container totes. Containers were properly sealed, labeled, and staged within a Navy-approved staging area near the maintenance shops near Site 1 (Building 11 Landfill). At NRC Pacific Beach, solid IDW was contained in three 55-gallon drums, and aqueous IDW was containerized into two new 275-gallon United States Department of Transportation-approved intermediate bulk container totes. Containers were properly sealed, labeled, and staged within a Navy-approved staging area along the edge of the Building 104 parking lot.

Upon completion of sampling activities and prior to disposal, CH2M field personnel collected waste characterization samples from the IDW containers. Solid and aqueous IDW samples were analyzed for volatile organic compounds, semivolatile organic compounds, pH, Resource Conservation and Recovery Act metals, total petroleum hydrocarbons, and ignitability as well as the 18 PFAS compounds listed in USEPA Method 537.1 in accordance with the Environmental Protection Plan (EPP)/Waste Management Plan (WMP) (CH2M, n.d.). All IDW was characterized as nonhazardous. However, the sum of PFOA and PFOS concentrations measured in one of the aqueous IDW totes was greater than the USEPA lifetime health advisory of 70 nanograms per liter (ng/L). Aqueous IDW was transported to an approved disposal facility and solidified prior to disposal. Weekly inspections to monitor staging area and container integrities were conducted from date of generation until transport and removal from the NAVSTA Everett on October 14, 2022, NRS Jim Creek on March 1, 2023, and NRC Pacific Beach on November 22, 2022.

IDW management activities were conducted in accordance with the EPP/WMP (CH2M, n.d). IDW analytical profiles and waste handling manifests are provided in **Appendix F**.

3.13 Laboratory Analysis and Data Usability Assessment

Groundwater and soil samples were submitted to Battelle Norwell Operations, Norwell, Massachusetts, a DoD Environmental Laboratory Accreditation Program accredited laboratory, in accordance with chain-of-custody procedures. Raw analytical data are provided in **Appendix G**. The following samples were analyzed for the 18 PFAS compounds listed in Method 537.1 via liquid chromatography tandem mass spectrometry compliant with Quality Systems Manual 5.1 Table B-15, in accordance with the SAP (CH2M, 2022):

- Perfluorobutanesulfonic acid (PFBS)
- PFOS
- PFOA
- Perfluorodecanoic acid (PFDA)
- Perfluorododecanoic acid (PFDoA)
- Perfluoroheptanoic acid (PFHpA)
- Perfluorohexanesulfonic acid (PFHxS)
- Perfluorohexanoic acid (PFHxA)
- Perfluorononanoic acid (PFNA)
- Perfluorotetradecanoic acid (PFTA)
- Perfluorotridecanoic acid (PFTrDA)

SITE INSPECTION REPORT FOR PER- AND POLYFLUOROALKYL SUBSTANCES NAVAL STATION EVERETT, EVERETT, WASHINGTON, NAVAL RADIO STATION JIM CREEK, ARLINGTON, WASHINGTON, AND NAVAL RECREATION COMPLEX PACIFIC BEACH, PACIFIC BEACH, WASHINGTON

- Perfluoroundecanoic acid (PFUnA)
- 4,8-dioxa-3H-perfluorononanoic acid (ADONA)
- 9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9CI-PF3ONS)
- 11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3OUdS)
- N-Ethyl Perfluorooctanesulfonamidoacetic acid (NEtFOSAA)
- N-Methyl Perfluorooctanesulfonamidoacetic acid (NMeFOSAA)
- Hexafluoropropylene oxide dimer acid (HFPO-DA)

After laboratory analysis of samples was complete, data usability was assessed. Data validation was conducted by an independent third-party data validator. Complete validation findings are presented in the data validation reports included in **Appendix H**. Data were then verified and prepared for upload to the Naval Installation Restoration Information Solution database, and a Data Quality Assessment was completed (**Appendix I**). The data validation review demonstrated that the analytical systems were generally in control, and data results can be used in the project decision-making process.

3.14 Deviations from the Sampling and Analysis Plan

The following field procedures deviated from the SAP (CH2M, 2022):

- Building 2114 (Fire Station)
 - Monitoring well NSE-B2114-MW-03 was moved approximately 100 feet south due to utilities.
- Site 1 (Building 11 Landfill)
 - Two subsurface soil samples were collected at NRSJC-S1-SB06. One from 7 to 8 feet bgs and one from 25 to 26 feet bgs.
 - Monitoring wells NRSJC-S1-MW-05 and NRSJC-S1-MW-07 had the filter pack sand placed to extend 1 foot above the top of the well screen due to limited annular space available to install the sanitary seal (screen set from 4 to 14 feet bgs).
- Site 6 (Blue Campground Landfill)
 - Monitoring well NRSJC-S7-MW-09 was moved about 75 feet southeast due to a conflict with a site gate and to protect the well from potential damage. The objective to evaluate the potential release area was still met.
 - Monitoring wells NRSJC-S6-MW-08 and NRSJC-S6-MW-09 had the filter pack sand placed to extend 1.5 feet above the top of the well screen due to limited annular space available to install the sanitary seal (screen set from 4 to 14 feet bgs). These wells also only had a 1.5-thick bentonite seal due to the limited depth.
- Site 7 (Pit Road Landfill)
 - Groundwater was not encountered within 140 feet bgs during the initial drilling of NRSJC-S7-MW-12. The well was subsequently abandoned because the drill crew did not have enough drill rod to extend the boring deeper. A decision was made to return to Site 7 to redrill the wells at a later date with a more efficient drill rig for depths greater than 200 feet. NRSJC-S7-MW-12 was redrilled approximately 75 feet southeast from the original location.
 - Monitoring wells NRSJC-S7-MW-11, NRSJC-S7-MW-12, and NRSJC-S7-MW-13 were completed with SCH 80 PVC pipe and well screen due to the greater depth and pressure on these three wells (greater than 200 feet bgs) compared to other wells installed. This deviation did not impact the performance of the well.
- Monitoring wells NRSJC-S7-MW11 and NRSJC-S7-MW13 were constructed with 20-foot well screens to increase the likelihood of producing groundwater in the well. NRSJC-S7-MW13 only had 0.5 foot of water in the well and was not developed because it did not produce water. It had trace water measured in the well during the synoptic water level event, suspected to be residual water in the bottom well cap. A groundwater sample was not collected at NRSJC-S7-MW13.
- NRSJC-S7-MW11 and NRSJC-S7-MW12 were collected with a bailer due to challenges with setting the submersible pump at the screen depth. WQPs were not collected.
- Subsurface soil samples were collected approximately every 50 feet at NRSJC-S7-SB-11, NRSJC-S7-SB-12, and NRSJC-S7-SB-13 to provide additional data regarding PFAS concentrations with depth.
- Site 4 (Metal Burial Pit)
 - Monitoring wells NRSJC-S4-MW-14 and NRSJC-S4-MW-15 were relocated approximately 150 feet southwest of the proposed locations due to accessibility issues. The wells were placed in the road due to a utility corridor on the shoulder of the road.
 - A shallow soil sample could not be collected at NRSJC-S4-SS-15 due to large boulders and rocks present underneath the surficial asphalt.
- Site 5 (Mixed Waste Landfill)
 - Monitoring wells NRSJC-S7-MW-17 was not drilled due to accessibility issues (proximity to unstable slope). Samples were not collected from this location.
- Building 106 (Former Fire Station)
 - The pump control box was broken for the bladder pump during sampling of NRCPB-B106-GW01 and NRCPB-B106-GW02. Wells were sampled using a bailer. Only one set of WQPs was collected at each well.

Table 3-1. Monitoring Well Construction Summary

Site Inspection Report for Per- and Polyfluoroalkyl Substances at Naval Station Everett, Everett, Washington,

Naval Radio Station Jim Creek, Arlington, Washington, and

Naval Recreation Complex Pacific Beach, Pacific Beach, Washington

Installation	Ground Surface	Top of PVC	Total Well Denth	Length of	Depth of Top	Depth of	Elevation of	Elevation of			
Monitoring Well	Date	Elevation	Casing Elevation	(ft btoc)	Scroon (ft)	of Screen	Bottom of Screen	Top of Screen	Bottom of Screen	Northing ^a	Easting ^a
	Date	(ft amsl)	(ft amsl)		Screen (IL)	(ft btoc)	(ft btoc)	(ft amsl)	(ft amsl)		
NSE-B2114-MW-01	7/27/2022	15.7470	15.4607	20	10	9.0	19.0	6.5	-3.5	364590.94	1300907.31
NSE-B2114-MW-02	7/28/2022	16.3350	15.9932	29	10	19.0	29.0	-3.0	-13.0	364524.59	1300836.69
NSE-B2114-MW-03	7/28/2022	15.7930	15.5715	25	10	15.0	25.0	0.6	-9.4	364308.56	1300857.56
NRSJC-B6-MW-01	6/2/2022	535.2200	534.8124	40	10	30.0	40.0	504.8	494.8	447300.36	1369819.24
NRSJC-B6-MW-02	6/3/2022	532.9000	532.5842	35	10	25.0	35.0	507.6	497.6	447221.82	1369701.01
NRSJC-B6-MW-03	6/8/2022	534.0401	533.7138	39	10	28.5	38.5	505.2	495.2	447259.23	1369622.51
NRSJC-B6-MW-04	6/13/2022	534.1270	533.8097	40	10	30.0	40.0	503.8	493.8	447284.04	1369690.57
NRSJC-S1-MW-05	6/19/2022	476.1501	476.2639	14	10	4.0	14.0	472.3	462.3	446488.54	1369835.45
NRSJC-S1-MW-06	6/21/2022	504.5267	507.3127	39	10	28.5	38.5	478.8	468.8	446483.13	1370007.10
NRSJC-S1-MW-07	6/20/2022	477.1628	476.9678	14	10	4.0	14.0	473.0	463.0	446413.21	1369883.15
NRSJC-S6-MW-08	6/15/2022	536.1630	538.8229	14	10	4.0	14.0	534.8	524.8	444709.24	1371835.73
NRSJC-S6-MW-09	6/19/2022	538.5814	541.3364	14	10	4.0	14.0	537.3	527.3	444603.13	1371904.00
NRSJC-S6-MW-10	6/13/2022	543.7300	546.2790	24	10	14.0	24.0	532.3	522.3	444703.88	1371653.42
NRSJC-S7-MW-11	11/7/2022	686.1040	688.5152	255	20	234.0	254.0	454.5	434.5	444645.17	1371117.40
NRSJC-S7-MW-12 ^b	10/12/2022	686.5450	689.1984	247	10	233.0	243.0	456.2	446.2	444562.41	1371147.54
NRSJC-S7-MW-13	10/27/2022	689.6260	692.3657	237	20	217.0	237.0	475.4	455.4	444574.39	1371078.67
NRSJC-S4-MW-14	7/8/2022	609.9010	609.5543	27	10	17.0	27.0	592.6	582.6	442870.92	1373735.05
NRSJC-S4-MW-15	7/8/2022	611.4160	611.1053	27	10	17.0	27.0	594.1	584.1	442835.11	1373780.14
NRSJC-S5-MW-16	7/8/2022	612.5220	615.3177	27	10	16.5	26.5	598.8	588.8	443119.83	1374102.53
NRSJC-S5-MW-18	7/8/2022	618.2660	621.0970	24	10	14.0	24.0	607.1	597.1	442803.59	1374234.34
NRSJC-S5-MW-19	7/8/2022	612.5870	615.4512	21	10	11.0	21.0	604.5	594.5	442943.50	1374158.17
NRCPB-B106-MW-01	8/4/2022	119.7947	119.4122	21	10	11.0	21.0	108.4	98.4	707361.01	720211.25
NRCPB-B106-MW-02	8/4/2022	118.5179	118.1027	20	10	10.0	20.0	108.1	98.1	707320.95	720105.48
NRCPB-B106-MW-03	8/8/2022	117.1624	116.8947	16	10	6.0	16.0	110.9	100.9	707311.18	720036.02

^a Northing and Easting in U.S. survey feet, North American Datum 1983 Washington State Plane North for Naval Station Everett and Naval Radio Station Jim Creek wells.

Northing and Easting in U.S. survey feet, North American Datum 1983 Washington State Plane South for Naval Recreation Complex Pacific Beach.

^b MW-12 was redrilled. Data are for the redrilled well.

amsl = above mean sea level. Vertical elevation references the North American Vertical Datum of 1988 (NAD88)

btoc = below top of casing

ft = feet

ID = identification

PVC = polyvinyl chloride

WA = Washington

Table 3-2. Groundwater Elevations

Site Inspection Report for Per- and Polyfluoroalkyl Substances at Naval Station Everett, Everett, Washington, Naval Radio Station Jim Creek, Arlington, Washington, and Naval Recreation Complex Pacific Beach, Pacific Beach, Washington

	Data	Ground Surface	Top of Casing	Depth to	Depth to	Groundwater
Monitoring Well	Date	Elevation	Elevation	Water	Water	Elevation
	lvieasured	(ft amsl)	(ft amsl)	(ft btoc)	(ft bgs)	(ft amsl)
NSE-B2114-MW-01	8/11/2022	15.7470	15.4607	5.81	5.52	9.65
NSE-B2114-MW-02	8/11/2022	16.3350	15.9932	7.82	7.48	8.17
NSE-B2114-MW-03	8/11/2022	15.7930	15.5715	6.60	6.38	8.97
NRSJC-B6-MW-01	3/1/2023	535.2200	534.8124	30.80	30.39	504.01
NRSJC-B6-MW-02	3/1/2023	532.9000	532.5842	24.36	24.04	508.22
NRSJC-B6-MW-03	3/1/2023	534.0401	533.7138	30.81	30.48	502.90
NRSJC-B6-MW-04	3/1/2023	534.1270	533.8097	26.40	26.08	507.41
NRSJC-S1-MW-05	12/15/2022	476.1501	476.2639	14.57	14.68	461.69
NRSJC-S1-MW-06	12/15/2022	504.5267	507.3127	42.02	44.81	465.29
NRSJC-S1-MW-07	12/15/2022	477.1628	476.9678	14.56	14.37	462.41
NRSJC-S6-MW-08	12/15/2022	536.1630	538.8229	17.5	20.16	521.32
NRSJC-S6-MW-09	12/15/2022	538.5814	541.3364	17.53	20.29	523.81
NRSJC-S6-MW-10	12/15/2022	543.7300	546.279	27.6	30.15	518.68
NRSJC-S7-MW-11	12/15/2022	686.1040	688.5152	257.35	259.76	431.17
NRSJC-S7-MW-12 ^a	12/15/2022	686.5450	689.1984	246.37	249.02	442.83
NRSJC-S7-MW-13 ^b	12/15/2022	689.6260	692.3657	240.25	242.99	452.12
NRSJC-S4-MW-14	12/15/2022	609.9010	609.5543	27.43	27.08	582.12
NRSJC-S4-MW-15	12/15/2022	611.4160	611.1053	27.31	27.00	583.80
NRSJC-S5-MW-16	12/15/2022	612.5220	615.3177	28.89	31.69	586.43
NRSJC-S5-MW-18	12/15/2022	618.2660	621.097	26.95	29.78	594.15
NRSJC-S5-MW-19	12/15/2022	612.5870	615.4512	23.52	26.38	591.93
NRCPB-B106-MW-01	8/9/2022	119.7947	119.4122	12.24	11.86	107.17
NRCPB-B106-MW-02	8/9/2022	118.5179	118.1027	11.98	11.56	106.12
NRCPB-B106-MW-03	8/9/2022	117.1624	116.8947	12.47	12.20	104.42

^a MW-12 was redrilled. Data are for the redrilled well.

^b Insufficient water to obtain an accurate water level measurement and sample.

amsl = above mean sea level. Vertical elevation references the North American Vertical Datum of 1988

bgs = below ground surface

btoc = below top of casing

ft = feet

Table 3-3. Water Quality Parameters

Site Inspection Report for Per- and Polyfluoroalkyl Substances at Naval Station Everett, Everett, Washington,

Naval Radio Station Jim Creek, Arlington, Washington, and

Naval Recreation Complex Pacific Beach, Pacific Beach, Washington

Monitoring Well	Sample Date	Sample Time	Depth to Water (ft btoc)	pH (SU)	Specific Conductivity (mS/cm)	Temperature ([°] C)	Dissolved Oxygen (mg/L)	Oxidation- Reduction Potential (mV)	Turbidity (NTU)	PID Readings (ppm)	Comments
NSE-B2114-MW01	8/11/2022	17:40	6.07	6.77	0.894	17.53	0	-123.0	6.67	0.0	Clear
NSE-B2114-MW02	8/11/2022	19:30	7.48	5.86	5.19	20.77	0	-86.0	391	0.0	Cloudy
NSE-B2114-MW03	8/11/2022	18:45	6.79	7.4	0.636	15.43	1.99	-6.3	7.77	0.0	Clear
NRSJC-B6-MW01	6/30/2022	10:20	31.2	6.18	0.076	11.90	11.51	185.2	202	0.0	Cloudy
NRSJC-B6-MW02	6/30/2022	12:55	22.58	6.29	0.076	10.50	8.73	178.1	25.9	0.0	Clear
NRSJC-B6-MW03	6/30/2022	14:55	31.2	5.93	0.161	12.20	8.56	203.6	9.64	0.0	Clear
NRSJC-B6-MW04	7/1/2022	9:45	28.46	5.47	0.088	11.60	7.84	154.3	163	0.0	Cloudy
NRSJC-S1-MW05	7/11/2022	17:00	5.59	5.35	0.193	12.00	2.14	175.8	9.08	0.0	Clear
NRSJC-S1-MW06	7/11/2022	14:45	30.1	5.31	0.181	11.10	6.84	157.4	6.16	0.0	Clear
NRSJC-S1-MW07	6/30/2022	14:50	4.41	5.66	0.144	12.60	3.42	115.1	1.55	0.0	Clear
NRSJC-S6-MW08	7/13/2022	13:05	9.88	6.04	0.104	10.80	2.59	174.4	7.39	0.0	Clear
NRSJC-S6-MW09	7/12/2022	12:50	8.95	5.62	0.092	12.10	2.51	149.6	3.56	0.0	Clear
NRSJC-S6-MW10	7/13/2022	12:00	19.22	4.85	0.056	9.70	5.56	229.7	12.4	0.0	Clear
NRSJC-S7-MW11 ^a	11/9/2022	15:15	NM	NM	NM	NM	NM	NM	NM	NM	NA
NRSJC-S7-MW12 ^{ab}	11/10/2022	13:35	NM	NM	NM	NM	NM	NM	NM	NM	NA
NRSJC-S7-MW13 ^c	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
NRSJC-S4-MW14	7/13/2022	14:20	18.55	6.74	0.194	11.70	7.07	164.5	0.46	0.0	Clear
NRSJC-S4-MW15	7/13/2022	15:15	18.22	6.63	0.177	12.00	9.26	159.0	0.22	0.0	Clear
NRSJC-S5-MW16	7/12/2022	15:30	22.52	5.93	0.096	10.00	11.11	165.4	9.10 ^d	0.0	Clear
NRSJC-S5-MW18	7/13/2022	9:40	18.41	6.09	0.108	9.40	8.4	157.6	0.34	0.0	Clear
NRSJC-S5-MW19	7/12/2022	10:40	14.89	6.14	0.115	10.80	9.17	166.7	1.38	0.0	Clear
NRCPB-B106-MW01	8/9/2022	11:40	12.24	6.05	0.307	15.65	7.15	139.0	>1000	NM	Light brown
NRCPB-B106-MW02	8/9/2022	12:40	11.98	6.15	0.159	15.85	11.22	123.0	>1000	NM	Light brown
NRCPB-B106-MW03	8/10/2022	10:30	12.7	5.29	0.102	15.88	5.55	197.0	5.25	0.0	Clear

^a Well sampled using a bailer. No parameters collected during sampling.

^b MW-12 was redrilled. Data are for the redrilled well.

^c Well was dry. No groundwater sample collected.

^dTurbidity reading not taken during last sample. Turbidity measurement is from second-to-last reading.

°C = degrees Celsius

btoc = below top of casing

ft = feet

mg/L = milligrams per liter

mS/cm = milliseimens per centimeter

mV = millivolts

NA = not applicable NM = not measured NTU = nephelometric turbidity units PID = photo ionization detection ppm = parts per million SU = standard units



LEGEND

- Monitoring Well and Soil Sample Location
- Stormwater Catch Basin
 - 5' Topographic Contours
- -> Groundwater Flow Direction
- > Anticipated Overland Water Flow Direction
- Groundwater Elevation Contour
- ----- Road Centerline
 - Potential PFAS Release Area
- Installation Boundary

 Figure 3-1

 Potentiometric Surface Map: NAVSTA Everett Building 2114 (Fire Station)

 Site Inspection for PFAS

 NSE-B2114-MW03 = well ID

 NAVSTA Everett, NRS Jim Creek,

 8.97 = groundwater elevation - ft amsl
 NRC Pacific Beach, Washington

NOTES: ft amsl = feet above mean sea level NRC = Naval Recreation Complex NAVSTA = Naval Station NRS = Naval Radio Station PFAS = Per- and polyfluoroalkyl substances

IMAGERY SOURCE: ESRI ArcGIS Online Web Service, World Imagery, 2021 Contours derived from USGS National Elevation Dataset





LEGEND

- Monitoring Well and Soil Sample Location
- Stormwater Catch Basin
- Unpaved Ditch
- Surface Waterbodies
- -> Groundwater Flow Direction
- > Anticipated Overland Water Flow Direction
- ----- Groundwater Elevation Contour
- 5' Topographic Contours
- ----- Road Centerline
- Potential PFAS Release Area
- ____ Installation Boundary

NSE-B2114-MW03 = well ID 8.97 = groundwater elevation - ft amsl

NOTES:

ft amsl = feet above mean sea level NRC = Naval Recreation Complex NAVSTA = Naval Station NRS = Naval Radio Station PFAS = Per- and polyfluoroalkyl substances B6-MW01 water level is considered anomalous and not used to generate groundwater elevation contours

IMAGERY SOURCE: ESRI ArcGIS Online Web Service, World Imagery, 2021 Contours derived from USGS National Elevation Dataset

Figure 3-2 Potentiometric Surface Map: NRS Jim Creek Building 6 Site Inspection for PFAS NAVSTA Everett, NRS Jim Creek, NRC Pacific Beach, Washington





- Monitoring Well and Soil Sampling Location
- Unpaved Ditch
- ----> Groundwater Flow Direction
- > Anticipated Overland Water Flow Direction
- Groundwater Elevation Contour
- 5' Topographic Contours
- Surface Waterbodies
- Road Centerline



Potential PFAS Release Area (assumed boundary) Installation Boundary

NSE-B2114-MW03 = well ID 8.97 = groundwater elevation - ft amsl

NOTES: ft amsl = feet above mean sea level NRC = Naval Recreation Complex NAVSTA = Naval Station NRS = Naval Radio Station PFAS = Per- and polyfluoroalkyl substances

IMAGERY SOURCE: ESRI ArcGIS Online Web Service, World Imagery, 2021 Contours derived from USGS National Elevation Dataset

Potentiometric Surface Map: NRS Jim Creek Site 1 Site Inspection for PFAS NAVSTA Everett, NRS Jim Creek, NRC Pacific Beach, Washington





LEGEND

- Monitoring Well and Soil Sample Location
- Groundwater Flow Direction
- Anticipated Overland Water Flow Direction
- Groundwater Elevation Contour
- Surface Waterbodies
- 5' Topographic Contours
- Road Centerline
- Potential PFAS Release Area (assumed boundary)

Installation Boundary

NSE-B2114-MW03 = well ID 8.97 = groundwater elevation - ft amsl

NOTES: ft amsl = feet above mean sea level NRC = Naval Recreation Complex NAVSTA = Naval Station NRS = Naval Radio Station PFAS = Per- and polyfluoroalkyl substances Groundwater elevation contours could not be generated for Site 7 due to lack of water level data.

IMAGERY SOURCE: ESRI ArcGIS Online Web Service, World Imagery, 2021 Contours derived from USGS National Elevation Dataset Potentiometric Surface Map: NRS Jim Creek Sites 6 and 7 Site Inspection for PFAS NAVSTA Everett, NRS Jim Creek, NRC Pacific Beach, Washington





- Groundwater Flow Direction
- > Anticipated Overland Water Flow Direction
- ----- Groundwater Elevation Contour
- Surface Waterbodies
- 5' Topographic Contours
- Road Centerline
- Potential PFAS Release Area (assumed boundary)

NOTES: ft amsl = feet above mean sea level NRC = Naval Recreation Complex NAVSTA = Naval Station NRS = Naval Radio Station PFAS = Per- and polyfluoroalkyl substances

IMAGERY SOURCE: ESRI ArcGIS Online Web Service, World Imagery, 2021 Contours derived from USGS National Elevation Dataset

Site Inspection for PFAS NAVSTA Everett, NRS Jim Creek, NRC Pacific Beach, Washington





LEGEND

- Monitoring Well and Soil Sample Location
- -> Groundwater Flow Direction
- > Anticipated Overland Water Flow Direction
- - Inferred Groundwater Elevation Contour
 - Surface Waterbodies
- 20' Topographic Contours
- ----- Road Centerline
 - Potential PFAS Release Area
- Installation Boundary

 Figure 3-6

 Potentiometric Surface Map: NRC Pacific Beach Building 106

 NSE-B2114-MW03 = well ID
 Site Inspection for PFAS

 8.97 = groundwater elevation - ft amsl
 NAVSTA Everett, NRS Jim Creek, NRC Pacific Beach, Washington

NOTES: ft amsl = feet above mean sea level NRC = Naval Recreation Complex NAVSTA = Naval Station NRS = Naval Radio Station PFAS = Per- and polyfluoroalkyl substances

IMAGERY SOURCE: ESRI ArcGIS Online Web Service, World Imagery, 2021 Contours derived from USGS National Elevation Dataset



Field Investigation Results

The details of the data evaluation, Human Health Risk Screening (HHRS) process, basis for recommendations, and installation boundary proximity and drinking water exposure assessment presented in the conceptual site models (CSMs) are described in this section. The CSMs and results are presented in **Tables 4-1** through **4-8**. The CSMs were updated with information obtained during this SI and include description and operational history, the SI approach, site-specific lithology, upper aquifer groundwater flow directions, data evaluation, off-Base drinking water exposure assessment, the HHRS findings, conclusions, and recommendations.

Data Evaluation and Human Health Risk Screening

The soil and groundwater analytical results were compared to the residential scenario soil and tap water SLs for PFOA, PFOS, PFBS, PFHxS, PFNA, and HFPO-DA, presented in the November 2022 Regional Screening Level (RSL) Table, consistent with DoD technical guidance (DoD, 2022). RSLs for perfluorobutanoic acid (PFBA) and PFHxA were added in the May 2023 RSL update and will be considered in the Remedial Investigation (RI) planning. While PFBA was not analyzed under the SI, it is unlikely to impact site management decisions based on results and concentrations at similar Navy sites. PFHxA was analyzed in the samples and is discussed in the HHRS (Appendix J) for each potential PFAS release area and the results are also shown in Tables 4-9 and 4-10.

Thus, the SLs are as follows:

- PFOA Soil SL: 19 micrograms per kilogram (μg/kg), Groundwater SL: 6.0 ng/L
- PFOS Soil SL: 13 μg/kg, Groundwater SL: 4.0 ng/L
- PFBS Soil SL: 1,900 μg/kg, Groundwater SL: 600 ng/L
- PFHxS Soil SL: 130 μg/kg, Groundwater SL: 39 ng/L
- PFNA Soil SL: 19 μg/kg, Groundwater SL: 5.9 ng/L
- HFPO-DA Soil SL: 23 μg/kg, Groundwater SL: 6.0 ng/L

The results for PFOA, PFOS, PFBS, PFHxS, PFNA, and HFPO-DA are presented for each of the investigation areas in **Figures 4-1** through **4-7** and summarized in **Tables 4-9** through **4-10**. Full analytical data tables are in **Appendix G**, and data validation reports are in **Appendix H**.

An HHRS based on future residential exposure and potable use of groundwater was conducted for the investigation areas ³ and is presented in detail in **Appendix J**. The HHRS evaluation is a preliminary risk screening tool used as a line of evidence to support site management decisions, path forward, and prioritization of future phases.

³ Although the SAP indicated a HHRS would only be prepared if concentrations exceeded SLs, HHRS were conducted for all investigations areas to formalize the documentation that unacceptable risks were not identified and to confirm that the reporting limits were satisfactory to meet the objectives.

4.1 Naval Station Everett Building 2114 (Fire Station)

Table 4-1. Building 2114 (Fire Station) Conceptual Site Model

Potential for PFAS Release. See Section 2.1.1 for Description and Operational History.	The PFAS PA (CH2M, 2021) identified Building 2114 as a potential PFAS release area. There were no reported spills or releases of AFFF associated with Building 2114; however, large quantities of AFFF were stored throughout its operating history as a fire station and satellite storage area. At similar facilities, firefighters historically filled the fire trucks by directly transferring AFFF from 5-gallon containers into fire trucks. Based on similar practices of AFFF transfer at other Navy installations during the same time period and the lack of available information for the handling and training practices, there is the potential for spills or leaks to have occurred during the transfer of AFFF into fire trucks.								
	 Soil and g Building 2 PFAS releated ramp wheted downgrad 	roundwater sample 114. New monitori ase areas (based or ere runoff potential lient (southwest) o	es were collected from ng well locations were n operational history). T Ily containing PFAS cou f the truck ramp.	newly installed monito selected near and dow Iwo wells are on either Id have accumulated, a	ring well locations at ngradient of likely side of the truck nd one well is				
SI Approach	 Three surfoot bgs (face soil samples w Table 4-9, Figure 4 -	ere collected from thre -1).	ee new monitoring well	locations from 0 to 1				
	 Three subsurface soil samples were collected from three locations within the capillary fringe ranging in depth from 9 to 10 feet bgs to 19 to 20 feet bgs (Table 4-9, Figure 4-1). 								
	• Three groundwater samples were collected from three newly installed monitoring wells with screen intervals ranging in depth from 9 to 19 feet btoc to 19 to 29 feet btoc (Table 4-10 ; Figure 4-1).								
	Monitoring	Well ID	NSE-B2114-MW01	NSE-B2114-MW02	NSE-B2114-MW03				
	Wells	Screen Interval (feet btoc)	9 to 19	19 to 29	15 to 25				
	Surface Soil	Station ID	NSE-B2114-SS01	NSE-B2114-SS02	NSE-B2114-SS03				
Sample Stations	Samples	Sample Depth (feet bgs)	0 to 1						
	Subsurface	Station ID	NSE-B2114-SB01	NSE-B2114-SB02	NSE-B2114-SB03				
	Soil Samples	Sample Depth (feet bgs)	9 to 10	19 to 20	19 to 20				
Site Lithology	Based on obse of poorly grad logs are provid	ervations from the sed sand with mino ded in Appendix B .	soil borings at Building r amounts of silt. Soil b	2117, subsurface lithole ecomes wet at 5 to 10 t	ogy consists primarily feet bgs. Soil boring				
Site Hydrology	There are no streams or surface drainage features near Building 2114. The Snohomish River channel is approximately 1,000 feet to the west, and East Waterway is approximately 500 feet to the south (Figure 2-2). Storm water is captured in a stormwater catch basin near the northern corner of the building (Figure 2-3).								
Groundwater	Groundwater at Building 2114 is present in an unconfined aquifer comprised of sand and thin interbedded silt layers. Depth to groundwater is between approximately 5.5 and 8 feet bgs. Based on water levels measured during groundwater sampling on August 11, 2022, groundwater flow near Building 2114 is west toward the Snohomish River channel (Figure 3-1).								

			SS			SB		GW		
	Analyte	Frequency of Detection	Frequency of Exceedance	Maximum Concentration (µg/kg)	Frequency of Detection	Frequency of Exceedance	Maximum Concentration (µg/kg)	Frequency of Detection	Frequency of Exceedance	Maximum Concentration (ng/L)
SI Results	PFOA	1/3	0/3	0.35 J	0/3	0/3	ND	3/3	2/3	12.9
Compared to SLs	PFOS	3/3	2/3	34.5	2/3	0/3	0.636 J	3/3	2/3	516
	PFBS	0/3	0/3	ND	0/3	0/3	ND	3/3	0/3	14.3
	PFHxS	2/3	0/3	2.77	0/3	0/3	ND	3/3	2/3	224
	PFNA	1/3	0/3	0.24 J	0/3	0/3	ND	2/3	0/3	2.19 J
	HFPO- DA	0/3	0/3	ND	0/3	0/3	ND	0/3	0/3	ND
Proximity to Base Boundary and Drinking Water Exposure Assessment	Building 2114 (Fire Station) is approximately 700 feet north of the southern installation boundary of NAVSTA Everett (Figure 2-2). Several private drinking water wells may exist within 1 mile to the northwest and south of NAVSTA Everett. Based on the upper aquifer groundwater flows to the west, the southern installation boundary is cross-gradient from Building 2114. Off-Base drinking water sampling is not warranted at this time.									
Results Summary, HHRS Findings, Conclusions, and Recommendations	PFOS wa detected PFOS wa HFPO-DA PFOA, PF were det Based or indicatin available The locat are at th B2114-W in the so building (CH2M, 2 exceedad occurred therefore	s detected l in surface s detected were not GOS, and P tected in g the HHRS g potentia e results. tion of the e monitori 1W-01 and il or groun has been u 2021). Wh nces of the l at Buildin e, an RI is i undated	l in surface e soil samp l in subsur detected. FHxS were roundwate i (Appendi l unaccept PFOS soil ng wells in NSE-B211 dwater at used histor ile a confir e SLs in gro g 2114. In RSL s from	e soil at two les below face soil at detected er below th is J), PFOS able huma exceedance mediately 4-MW-02) the well cr rically to st med releas oundwater addition, Futur May 2023	o locations the SLs. PF two locat in groundy ne SLs. HFF and PFHXS on health r ces and PF y to the no , part of B ross-gradie ore AFFF of se of AFFF and PFOS PFOS and I re RI activi	s above the BS and HF ions below water at tw PO-DA was 5 were ider isks. There OA, PFOS, ortheast ar uilding 21: ent of Build concentrat was not d exceedance PFHxS wer ties will inc	e SLS. PFO/ PO-DA we v the SLS. F vo wells ab not detect trified as C e were no C and PFHxS disouthwe 14 (Fire Sta ding 2114 (e and fire sta coumente ce of the Si e identified	A, PFHxS, a re not det FOA, PFBS ove the SI ted. OPCs for g COPCs in s groundw est of the f ation). PFA NSE-B211 trucks with d; the PFO Ls in soil ir d as COPCs valuation o	and PFNA v ected. 5, PFHxS, P _s. PFBS ar groundwat oil based c ater excee irre truck r. S did not e 4-MW-03) n foam tan A, PFOS, a odicate a re s for groun of PFBA an	were FNA, and d PFNA er, on dances amp (NSE- exceed SLs . The ks nd PFHxS elease idwater; d PFHxA

Table 4-1. Building 2114 (Fire Station) Conceptual Site Model

btoc = below top of casing

COPC = chemical of potential concern

GW = groundwater samples

J = Analyte present, value may or may not be accurate or precise

ND = not detected

RI = Remedial Investigation

SB = subsurface soil samples

SS = surface soil samples

4.2 Naval Radio Station Jim Creek Building 6 (Former Fire Station)

Potential for PFAS Release. See Section 2.1.2 for Description and Operational History.	The PFAS PA (CH2M, 2021) identified Building 6 as a potential PFAS release area. Based on historical knowledge, AFFF containers that leaked were stored at Building 6 and were rinsed off outside of Building 6.								
SI Approach	 Soil and g locations likely PFA of the bu and spray surface ri groundw Disposal Three sur Figure 4-i surface; i Six subsu bgs to 36 Four grou screen in Figure 4-i 	 locations at Building 6. New monitoring well locations were selected near and downgradient of likely PFAS release areas (based on operational history). Two wells are on the east and west side of the building, two potential locations where leaky containers of AFFF were reportedly placed and sprayed off; one well is near the stormwater catch basin southwest of the building where surface run off potentially containing PFAS could have accumulated and infiltrated to soil and/or groundwater and from which debris may have been removed and deposited at the Bio Pit Disposal Area; and one well is downgradient (west) of Building 6. Three surface soil samples were collected from three locations from 0 to 0.5 foot bgs (Table 4-9; Figure 4-2). A surface soil sample was not collected at NRSJC-B6-MW01 due to asphalt at the surface; instead, a subsurface soil sample was collected from 1 to 2 feet bgs. Six subsurface soil samples were collected from four locations ranging in depth from 1 to 2 feet bgs to 36 to 37 feet bgs (Table 4-9; Figure 4-2). Four groundwater samples were collected from four newly installed monitoring wells with screen intervals ranging in depth from 25 to 35 feet btoc to 30 to 40 feet btoc (Table 4-10; Figure 4-2). 							
	Monitoring	Well ID	NRSJC-B6- MW01	NRSJC-B6- MW02	NRSJC-B6- MW03	NRSJC-B6- MW04			
	Wells	Screen Interval (feet btoc)	30 to 40	25 to 35	28.5 to 38.5	30 to 40			
Samula Stations	Surface Soil	Station ID Surface Soil		NRSJC-B6-SS- 02	NRSJC-B6-SS- 03	NRSJC-B6-SS- 04			
Sample Stations	Samples	Sample Depth (feet bgs)	Asp	halt	0 to 0.5				
	Subsurface	Station ID	NRSJC-B6-SB- 01	NRSJC-B6-SB- 02	NRSJC-B6-SB- 03	NRSJC-B6-SB- 04			
	Samples	Sample Depth (feet bgs)	1 to 2 29 to 30	36 to 37	29 to 30	27 to 28 29 to 30			
Site Lithology	Based on obs feet of silty an clay. Soil becc	ervations from the nd clayey gravel ur omes wet at 30 to 3	e soil borings at Bu nderlain by 15 to 2 35 feet bgs. Soil b	ilding 6, subsurfa 5 feet of sand and oring logs are pro	ce lithology consis d silty sand underl vided in Appendix	ts of 15 to 25 ain by sandy a B .			
Site Hydrology	Jim Creek is a unpaved ditch road. A storm	Jim Creek is approximately 450 feet to the west (Figure 2-5) and flows northwest past Building 6. An unpaved ditch runs from the southern end of the building toward the south along a paved service road. A stormwater catch basin is near the southwest corner of the building.							
Groundwater	Groundwater Depth to grou measured on (Figure 3-2).	at Building 6 is pre Indwater is betwee March 1, 2023, gre	esent in an uncont en approximately oundwater flow n	fined aquifer com 25 and 38 feet bg ear Building 6 is to	prised of sand and s. Based on synop o the west toward	l clayey sand. tic water levels Jim Creek			

Table 4-2. Building 6 (Former Fire Station) Conceptual Site Model

			SS			SB ^a			GW	
	Analyte	Frequency of Detection	Frequency of Exceedance	Maximum Concentration (µg/kg)	Frequency of Detection	Frequency of Exceedance	Maximum Concentration (µg/kg)	Frequency of Detection	Frequency of Exceedance	Maximum Concentration (ng/L)
SI Results	PFOA	0/3	0/3	ND	0/6	0/6	ND	4/4	0/4	2.97 J
	PFOS	2/3	0/3	0.356 J	0/6	0/6	ND	4/4	4/4	60.6
	PFBS	1/3	0/3	0.356 J	0/6	0/6	ND	4/4	0/4	17.4
	PFHxS	1/3	0/3	2.59	1/6	0/6	0.751 J	4/4	1/4	153
	PFNA	0/3	0/3	ND	0/6	0/6	ND	0/4	0/4	ND
	HFPO- DA	0/3	0/3	ND	0/6	0/6	ND	0/4	0/4	ND
Proximity to Base Boundary and Drinking Water Exposure Assessment	Building 6 boundary to the no Because . propertie lifetime co not excee time.	6 (Former y of NRS Ji rth of NRS Jim Creek es north of Irinking wa eded in gro	Fire Static m Creek (I 5 Jim Creel flows wes 5 NRS Jim (ater healt oundwate	on) is appro Figure 2-4) k. Upper a t from the Creek are r h advisory r at Buildir	oximately 1). Several pr quifer grou northwest not impacte of 70 ppt fo ng 6. Off-Ba	,400 feet rivate drin ndwater f corner of ed by grou or PFOA a se drinkin	south of the king water lows to the NRS Jim Cro ndwater fro nd PFOS, ino g water san	e northern wells may west towa eek, off-in om Buildin dividually opling is n	installation exist within ard Jim Cree stallation g 6. The US or combine ot warrante	n 1 mile ek. EPA d, was ed at this
Results Summary, HHRS Findings, Conclusions, and Recommendations	PFOS, PFI DA were PFHxS wa DA were No excee the storm been disp exposure material surface o PFOS was the SL. PF DA were Based on potential All wells the east s remainin and west exceedar was idem include a	BS, and PF not detect as detecte not detect dances of nwater cat oosed of a to PFAS t that was r r subsurfa detected OA and P not detect the HHRS unaccept exceeded side of Bui g wells, it of the bu nces of the tified as C	HXS were ted. d in one si ted. surface so cch basin v t the Bio F hat may h emoved a tec soil or in ground FBS were ted. (Append able huma the PFOS Iding 6 (Fo is possible ilding whe e SLs in gro OPC for gr on of PFB.	detected i ubsurface bil above t vhere vege tit Disposa ave accum nd dispose groundwa dwater at f detected i water at f detected i ix J), PFOS an health r groundware that AFFF re leaky A poundwate A and PFH	in surface so soil sample he SLs were etation and I Area. This bulated in the ter at that so four wells a n groundwa was identif risks. There ter SL, inclu Station). As was releas FFF contain indicate a er; therefore	oil sample below the e detected debris ma s suggests he stormw Bio Pit an site. bove the S ater at fou fied as a C were no C ding NRSJ s NRSJC-B red at both lears may h release oc e, an RI is e undated	s below the e SL. PFOA, l in the born ay have accu no unaccep vater catchn ea would no SL. PFHxS wa r wells belo OPC for gro COPCs in soi C-B6-MW01 is for truck r ave been ri courred at B courred at B	SLS. PFO/ PFOS, PFB and at B6-N umulated stable risks nent basin of pose a r as detecte w the SLS undwater, I based or I at the fir cross-grad ramps eas nsed off. T uilding 6. I led. Future May 2023	A, PFNA, and S, PFNA, and AW02 adjac and could h s associated and there isk for leach d at one we be at one we there the source the the source of the buil of the buil of the buil of the buil of the buil of the buil of the source of the sour	d HFPO- ad HFPO- eent to ave d with fore ning into ell above HFPO- esults. nps on d PFHxS PFOS es will

Table 4-2. Building 6 (Former Fire Station) Conceptual Site Model

^a Subsurface soil samples are from multiple depths at some locations.

ppt = part(s) per trillion

4.3 Naval Radio Station Jim Creek Site 1 (Building 11 Landfill)

Table 4-3. Site 1 (Building 11 Landfill) Conceptual Site Model

Potential for PFAS Release. See Section 2.1.2 for Description and Operational History.	The PFAS PA (C available for rev landfill; howeve early as 1976 (C AFFF containers is possible that	The PFAS PA (CH2M, 2021) identified Site 1 as a potential PFAS release area. Records were not available for review that would confirm disposal of AFFF or other PFAS-containing chemicals at the landfill; however, according to a former fire chief, AFFF was being stored at Building 6 at least as early as 1976 (CH2M, 2021), while the Site 1 landfill was in use, and the final disposition of these AFFF containers is unknown. Because waste was not removed from the installation prior to 1991, it is possible that these containers were disposed of at Site 1.									
SI Approach	 Soil and gre Site 1. New release are the uncerta monitoring groundwat boundary a Four surfac Figure 4-3) Five subsun feet bgs to monitoring 	 Somand groundwater samples were collected from newly installed monitoring well locations at Site 1. New monitoring well locations were selected near and downgradient of likely PFAS release areas (based on operational history) in areas accessible to drilling equipment. Due to the uncertainty of the landfill extent, a groundwater sample was also collected from a new monitoring well installed on the topographically higher northeast side of the landfill to assess groundwater that may have been impacted by debris deposited outside the mapped landfill boundary as well as to provide an additional data point to confirm groundwater flow direction. Four surface soil samples were collected from four locations from 0 to 0.5 foot bgs (Table 4-9; Figure 4-3). Five subsurface soil samples were collected from four locations ranging in depth from 2 to 3 feet bgs to 25 to 26 feet bgs (Table 4-9; Figure 4-3). Samples were collected from the three new monitoring wells and one soil location near the downgradient landfill boundary accessible to hand-augering. 									
	 nand-augering. Three groundwater samples were collected from three newly installed monitoring wells with screen intervals ranging in depth from 4 to 14 feet btoc to 28.5 to 38.5 feet btoc (Table 4-10; Figure 4-3). 										
	Monitoring	Well ID	NRSJC-S1- MW05	NRSJC-S1- MW06	NRSJC-S1- MW07	Soil only					
	Wells	Screen Interval (feet btoc)	4 to 14	28.5 to 38.5	4 to 14	Soli only					
Sample Stations	Surface Soil	Station ID	NRSJC-S1- SS05	NRSJC-S1- SS06	NRSJC-S1- SS07	NRSJC-S1- SS20					
Sample Stations	Samples	Sample Depth (feet bgs)		0 tc	0.5						
	Subsurface	Station ID	NRSJC-S1- SB05	NRSJC-S1- SB06	NRSJC-S1- SB07	NRSJC-S1- SB20					
	Soil Samples	Sample Depth (feet bgs)	3.5 to 4.5	7 to 8 25 to 26	3 to 4	2 to 3					
Site Lithology	Based on obser feet of a hetero feet on top of t logs are provide	Based on observations from the soil borings at Site 1, the subsurface lithology consists of 20 to 50 feet of a heterogeneous mixture of silt, sand, and gravel underlain by clay. Soils become wet at 30 feet on top of the hill near Building 11 and at approximately 4 feet at the foot of the hill. Soil boring logs are provided in Appendix B .									
Site Hydrology	Jim Creek is app (Figure 2-6). Jin 1. An unpaved	Jim Creek is approximately 300 feet southwest of Site 1 (Figure 2-6) and flows northwest past Site 1 (Figure 2-6). Jim Creek is believed to be in direct hydraulic communication with groundwater at Site 1. An unpaved drainage ditch is approximately 400 feet east of Site 1.									

Table 4-3. Site 1 (Building 11 Landfill) Conceptual Site Model

Groundwater	Groundwater at Site 1 is present in an unconfined aquifer comprised of silty sand and silty gravel. Depth to groundwater is approximately 30 feet at the top of the hill near Building 11 and approximately 4 to 5 feet at the bottom of the hill. Based on the synoptic water levels measured on December 15, 2022, groundwater flow at Site 1 is to the west-southwest (Figure 3-3).									
		SS				SB ^a		GW		
	Analyte	Frequency of Detection	Frequency of Exceedance	Maximum Concentration (µg/kg)	Frequency of Detection	Frequency of Exceedance	Maximum Concentration (µg/kg)	Frequency of Detection	Frequency of Exceedance	Maximum Concentration (ng/L)
SI Results Compared to SLs	PFOA	0/4	0/4	ND	0/5	0/5	ND	2/3	0/3	2.22 J
	PFOS	1/4	0/4	0.218 J	0/5	0/5	ND	0/3	0/3	ND
	PFBS	0/4	0/4	ND	0/5	0/5	ND	1/3	0/3	1.29 J
	PFHxS	0/4	0/4	ND	0/5	0/5	ND	0/3	0/3	ND
	PFNA	0/4	0/4	ND	0/5	0/5	ND	0/3	0/3	ND
	HFPO-DA	0/4	0/4	ND	0/5	0/5	ND	0/3	0/3	ND
Proximity to Base Boundary and Drinking Water Exposure Assessment	Site 1 (Buik of NRS Jim north of NF Because Jir properties drinking wa exceeded in	ding 11 La Creek (Fig RS Jim Cre n Creek flo north of N ater healtl n groundv	ndfill) is a g ure 2-4). ek. Upper ows west NRS Jim Cr n advisory vater at Si	pproximat Several pri aquifer gr from the n reek are nc of 70 ppt ite 1. Off-B	ely 2,200 ivate drink oundwate orthwest ot impacte for PFOA ase drinki	feet south king water v er flows to t corner of N d by ground and PFOS, i ng water sa	of the nor wells may the west-s IRS Jim Cre dwater fro ndividually ampling is	thern insta exist withi outhwest eek, off-ing m Site 1. y or combi not warra	allation bo n 1 mile t toward Jir stallation The USEP/ ined, was nted at th	oundary o the m Creek. A lifetime not is time.
	PFOS was c were not d	letected in etected.	n one surf	ace soil sa	mple belo	w the SL. P	FOA, PFBS	, PFHxS, P	FNA, and	HFPO-DA
Provide Commence	PFAS were PFOA was of below the S	not detec detected i SL. PFOS, I	ted in sub n groundv PFHxS, PF	water at tw NA, and HI	vo wells b FPO-DA w	s. elow the SL ere not det	, and PFBS ected.	was dete	cted at or	ne well
Results Summary, HHRS Findings, Conclusions, and Recommendations Based on the HHRS, COPCs were not identified, indicating there are risks associated with exposure to PFAS in soil and groundwater (App not detected in site media. While PFBA was not analyzed under the management decisions based on results and concentrations at simil								unaccepta lix J). In ac t is unlikel lavy sites.	ble huma ddition, Pf y to impa	n health HxA was ct site
	Based on th	ne followi	ng lines of	f evidence,	, additiona	al investigat	ion is not	recomme	nded at th	is time:
	Concer COPCs	ntrations (DT PFUA, F	γFUS, and	FR2 did n	lot exceed S	sis, and th	e HHRS di	a not ider	ιτιτγ
	• There	is no docu	imentatio	n of a relea	ase from t	ine PA				

^a Subsurface soil samples are from multiple depths at some locations.

4.4 Naval Radio Station Jim Creek Site 6 (Blue Campground Landfill)

Table 4-4. Site 6 (Blue Campground Landfill) Conceptual Site Model

Potential for PFAS Release. See Section 2.1.2 for Description and Operational History.	The PFAS PA (CH2M, 2021) identified Site 6 as a potential PFAS release area. Records were not available for review that would confirm disposal of AFFF or other PFAS-containing chemicals at the landfill; however, according to a former fire chief, AFFF was being stored at Building 6 at least as early as 1976 (CH2M, 2021), while the Site 6 landfill was in use, and the final disposition of these AFFF containers is unknown. Because waste was not removed from the installation prior to 1991, it is possible that these containers were disposed of at Site 6.									
SI Approach ^{ed}	 Soil and groundwater samples were collected from newly installed monitoring well locations a Site 6. New monitoring well locations were selected near and downgradient of likely PFAS release areas (based on operational history). Due to the uncertainty of the landfill extent, to the west and south, a groundwater sample was also collected from new monitoring wells installed on the west and south sides of the landfill to assess groundwater that may have been impacted by debris deposited outside the mapped landfill boundary as well as to provide an additional data point to confirm groundwater flow direction. Three surface soil samples were collected from three locations from 0 to 0.5 foot bgs 									
	(Table 4-9;	Figure 4-4).								
	• Three subsurface soil samples were collected from three locations ranging in depth from 3.5 to 4 feet bgs to 14 to 15 feet bgs (Table 4-9 ; Figure 4-4).									
	Three groundwater samples were collected from three newly installed monitoring wells with screen intervals ranging in depth from 4 to 14 feet btoc to 14 to 24 feet btoc (Table 4-10; Figure 4-4).									
	Monitoring	Well ID	NRSJC-S6-MW08	NRSJC-S6-MW09	NRSJC-S6-MW10					
	Wells	Screen Interval (feet btoc)	4 to 14	4 to 14	14 to 24					
	Surface Soil	Station ID	NRSJC-S6-SS08	NRSJC-S6-SS09	NRSJC-S6-SS10					
Sample Stations	Samples	Sample Depth (feet bgs)	0 to 0.5							
	Subsurface	Station ID	NRSJC-S6-SB08	NRSJC-S6-SB09	NRSJC-S6-SB10					
	Soil Samples	Sample Depth (feet bgs)	3.5 to 4	3.5 to 5	14 to 15					
Site Lithology	Based on obser approximately 2 anywhere betw	vations from the soi 25 feet of silty and c reen 8 and 20 feet by	l borings at Site 6, the layey sand and gravel gs. Soil boring logs are	subsurface lithology o underlain by clay. Soil provided in Appendi	consists of Is are wet at K B .					
Site Hydrology	Jim Creek is approximately 60 feet to the northeast (Figure 2-7) and flows northwest past Site 6 (Figure 2-7). Jim Creek is believed to be in direct hydraulic communication with groundwater at Site 6.									
Groundwater	Groundwater at Site 6 is present in an unconfined aquifer comprised of silty sand and gravel. Depth to groundwater is 20 feet bgs near Jim Creek and up to 30 feet bgs further from the creek. Based on synoptic water levels measured on December 15, 2022, groundwater flow at Site 6 is to the north-northwest approximately parallel to the flow of Jim Creek (Figure 3-4).									

		SS				SB GW					
	Analyte	Frequency of Detection	Frequency of Exceedance	Maximum Concentration (µg/kg)	Frequency of Detection	Frequency of Exceedance	Maximum Concentration (µg/kg)	Frequency of Detection	Frequency of Exceedance	Maximum Concentration (ng/L)	
SI Results Compared to SLs	PFOA	0/3	0/3	ND	0/3	0/3	ND	1/3	0/3	1.24 J	
	PFOS	1/3	0/3	0.284 J	0/3	0/3	ND	0/3	0/3	ND	
	PFBS	0/3	0/3	ND	0/3	0/3	ND	0/3	0/3	ND	
	PFHxS	0/3	0/3	ND	0/3	0/3	ND	0/3	0/3	ND	
	PFNA	0/3	0/3	ND	0/3	0/3	ND	0/3	0/3	ND	
	HFPO-DA	0/3	0/3	ND	0/3	0/3	ND	0/3	0/3	ND	
Proximity to Base Boundary and Drinking Water Exposure Assessment	Site 6 (Blue boundary of mile to the parallel to J Because Jin properties drinking wa exceeded in	Campgro of NRS Jim north of N lim Creek n Creek flo north of N ater health n groundw	und Landf Creek (Fig NRS Jim Cr and is beli ows west f IRS Jim Cro advisory vater at Sin	ill) is approventing gure 2-4). S eek. Uppe eved to be from the n eek are no of 70 ppt te 6. Off-B	oximately Several pri r aquifer g in direct orthwest t impacted for PFOA a ase drinking	3,900 fee ivate drink groundwat hydraulic corner of l d by grour and PFOS, ng water s	t south of king water ter flows t communia NRS Jim Cr ndwater fr individual ampling is	the northe wells may o the north cation with reek, off-in om Site 6. ly or comb s not warra	ern installa exist with n-northwe Jim Creel stallation USEPA life ined, was inted at th	tion in 1 est c. etime not is time.	
	PFOS was o DA were no	letected in ot detecte	n one surfa d. od in subs	ace soil sai	nple belo	w the SL. I	PFOA, PFB	S, PFHxS, P	FNA, and	HFPO-	
Results Summary. DA were not detected in subsurface soil samples. PFOA was detected in groundwater at one well below the SL. PFOS, PFBS, PFHxS, PFNA, a DA were not detected.									PFNA, and	d HFPO-	
HHRS Findings, Conclusions, and Recommendations	Based on th risks associ was not de site manag	ne HHRS, (ated with tected in s ement dec	COPCs were exposure site media cisions bas	re not ider to PFAS in . While PF sed on res	itified, ind soil and g BA was no ults and co	icating the roundwat ot analyzed oncentrati	ere are no er (Appen d under th ons at sim	unaccepta I dix J). In a e SI, it is ui ilar Navy s	able huma ddition, Pl nlikely to i ites.	n health FHxA mpact	
	 Based on the following lines of evidence, additional investigation is not recommended at this time: Concentrations of PFOA and PFOS did not exceed SLs, and the HHRS did not identify COPCs There is no documentation of a release from the PA 										

Table 4-4. Site 6 (Blue Campground Landfill) Conceptual Site Model

4.5 Naval Radio Station Jim Creek Site 7 (Pit Road Landfill)

Table 4-5. Site 7 (Pit Road Landfill) Conceptual Site Model

Potential for PFAS Release. See Section 2.1.2 for Description and Operational History.	The PFAS PA (available for re landfill; howev early as 1976 (AFFF containe it is possible th	The PFAS PA (CH2M, 2021) identified Site 7 as a potential PFAS release area. Records were not available for review that would confirm disposal of AFFF or other PFAS-containing chemicals at the landfill; however, according to a former fire chief, AFFF was being stored at Building 6 at least as early as 1976 (CH2M, 2021), while the Site 7 landfill was in use, and the final disposition of these AFFF containers is unknown. Because waste was not removed from the installation prior to 1991, it is possible that these containers were disposed of at Site 7.								
SI Approach ^a	 Soil and g at Site 7. I release ar Accessible installed j outside th further so flow direc Three surf (Table 4-9 Fifteen su to 39 feet 	 Soli and groundwater samples were collected from newly installed monitoring well locations at Site 7. New monitoring well locations were selected near and downgradient of likely PFAS release areas (based on operational history) in areas accessible to drilling equipment. Accessible drilling locations are limited by topography; therefore, one monitoring well was installed just outside the northeast landfill boundary, one monitoring well was installed just outside the southeast landfill boundary, and one additional monitoring wells was installed further southeast of the landfill to provide additional data points for confirming groundwater flow direction. Three surface soil samples were collected from three locations from 0 to 0.5 foot bgs (Table 4-9; Figure 4-5). Fifteen subsurface soil samples were collected from three locations ranging in depth from 38 to 39 feet bgs to 231 to 232 feet bgs (Table 4-9; Figure 4-5). 								
	 Two groundwater samples were collected from three newly installed monitoring wells with screen intervals ranging in depth from 233 to 243 feet btoc to 234 to 254 feet btoc (Table 4 10; Figure 4-5). NRSJC-S7-MW13, screened from 217 to 237 feet btoc, was not sampled because the well was dry. 									
	Monitoring	Well ID	NRSJC-S7-MW11	NRSJC-S7-MW12	NRSJC-S7-MW13					
	Wells	Screen Interval (feet btoc)	234 to 254	233 to 243	217 to 237 well dry					
	Surface Soil	Station ID	NRSJC-S7-SS11	NRSJC-S7-SS12	NRSJC-S7-SS13					
Sample Stations	Samples	Sample Depth (feet bgs)	0 to 0.5							
		Station ID	NRSJC-S7-SB11	NRSJC-S7-SB12	NRSJC-S7-SB13					
	Subsurface Soil Samples	Sample Depth (feet bgs)	42.5 to 43.5 93 to 94 146 to 147 191 to 192 231 to 232	96 to 97 145 to 147 174 to 175 210 to 211 229 to 230	38 to 39 84 to 85 128 to 129 177 to 178 215 to 216					
Site Lithology	Based on obse approximately transitions to s approximately	Based on observations from the soil borings at Site 7, the subsurface lithology consists of approximately 240 feet of dense sand and gravel and trace lenses of silt and clay. Lithology transitions to silt/clay dominant at between 235 and 240 feet bgs. Soils become wet at approximately 235 feet bgs. Soil boring logs are provided in Appendix B .								
Site Hydrology	Cub Creek is approximately 500 feet to the west and flows north past Site 7 (Figure 2-7).									
Groundwater	Groundwater at Site 7 is present in an unconfined aquifer comprised of silty sand and interbedded silt layers. Depth to groundwater is approximately 240 feet bgs. One of the wells installed at Site 7 was dry during the synoptic water level survey on December 15, 2022; therefore, a groundwater flow direction could not be determined.									

			SS	_		SB ^a			GW	
SI Desulte Compared	Analyte	Frequency of Detection	Frequency of Exceedance	Maximum Concentration (µg/kg)	Frequency of Detection	Frequency of Exceedance	Maximum Concentration (µg/kg)	Frequency of Detection	GW Jo Jo Suppose 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 0/2 n installation bound twithin 1 mile to the the sted etermined at Sid Sidwater at Site 7. Off ased on the HHRS, did not this accommended at this not Area. Vegetation an ation than Site 7. No PF Iline of evidence th	Maximum Concentration (ng/L)
to SLs	PFOA	0/3	0/3	ND	0/15	0/15	ND	0/2	0/2	ND
	PFOS	0/3	0/3	ND	0/15	0/15	ND	0/2	0/2	ND
	PFBS	0/3	0/3	ND	0/15	0/15	ND	0/2	0/2	ND
	PFHxS	0/3	0/3	ND	0/15	0/15	ND	0/2	0/2	ND
	PFNA	0/3	0/3	ND	0/15	0/15	ND	0/2	0/2	ND
	HFPO-DA	0/3	0/3	ND	0/15	0/15	ND	0/2	0/2	ND
Proximity to Base Boundary and Drinking Water Exposure Assessment	Site 7 (Pit F NRS Jim Cr north of NF because or drinking wa	Road Land eek (Figur RS Jim Cre ne of the t ater samp	fill) is appr e 2-4). Sev ek. Groun hree wells ling is not	oximately veral priva dwater flo was dry. I warranteo	4,000 fee te drinking w in the u No PFAS w l at this tir	t south of g water we pper aquit vere detec me.	the north ells may ex fer could r ted in grou	ern install kist within not be det undwater	ation bour 1 mile to f ermined a at Site 7. C	ndary of the t Site 7 Off-Base
Results Summary, HHRS Findings, Conclusions, and Recommendations	No PFAS w were not ic exposure to site media. decisions b Based on tl PFOS, identif There Site 7 i potent surface detect PFAS r	ere detect Jentified, i o PFAS in s While PFI ased on ra he followin PFOA, PFE y COPCs is no docu is located ial surface e water ru ions in sur elease occ	eed in surfa ndicating soil ^b and g BA was no esults and ng lines of S, PFHxS, mentation approxima e soil debr noff may l face soil a curred at t	ace soil, su there are groundwat t analyzed concentra evidence, PFNA, and n of a relea ately 250 f is was plac have trans und ground he Bio Pit	Ibsurface : no unacce er (Apper under tha itions at si additiona I HFPO-DA ase from t eet west of ced on an ported su dwater at 2 Disposal A	soil or gro ptable hui ndix J). In a e SI, it is un milar Navv I investiga were not were not he PA of the Bio I space at a rface soil a Site 7 are a vrea.	undwater. man healt addition, P nlikely to i y sites. ition is not detected, Pit Disposa higher ele and debris an addition	Based on h risks ass FHxA was mpact site t recomme and the F al Area. Ve evation tha towards S nal line of	the HHRS ociated wi not detect ended at ti IHRS did n egetation a site 7 si site 7. No l evidence	, COPCs ith ted in nent his time: ot and uch that PFAS that no

Table 4-5. Site 7 (Pit Road Landfill) Conceptual Site Model

^a Subsurface soil samples are from multiple depths at some locations.

^b Subsurface soil samples at Site 7 were collected at depths ranging from 38 to 39 feet bgs to 231 to 232 feet bgs, which is deeper than a human receptor would be expected to contact; therefore, subsurface soil was not included in the HHRS for Site 7.

4.6 Naval Radio Station Jim Creek Site 4 (Metal Burial Pit)

Table 4-6. Site 4 (Metal Burial Pit) Conceptual Site Model

Potential for PFAS Release. See Section 2.1.2 for Description and Operational History.	The PFAS PA (Cl available for rev landfill; howeve early as 1976 (C AFFF containers it is possible that	H2M, 2021) identifiview that would concerned according to a foc CH2M, 2021), while a sis unknown. Becau at these containers	ed Site 4 as a potential PFAS rele nfirm disposal of AFFF or other PI ormer fire chief, AFFF was being s the Site 4 landfill was in use, and use waste was not removed from were disposed of at Site 4.	ase area. Records were not FAS-containing chemicals at the tored at Building 6 at least as I the final disposition of these the installation prior to 1991,							
SI Approach	 Soil and gro at Site 4. N release are Surface soi Three subs 	Soil and groundwater samples were collected from newly installed monitoring well locations at Site 4. New monitoring well locations were selected near and downgradient of likely PFAS release areas (based on operational history). Surface soil samples were not collected due to asphalt surface. Three subsurface soil samples were collected from two locations ranging in depth from 2 to 3 foot here to 17 to 18 foot here (Table 4.0: Figure 4.6).									
	feet bgs toTwo ground screen inter	 feet bgs to 17 to 18 feet bgs (Table 4-9; Figure 4-6). Two groundwater samples were collected from two newly installed monitoring wells with screen intervals both ranging in depth from 17 to 27 feet btoc (Table 4-10; Figure 4-6). 									
		Well ID	NRSJC-S4-MW14	NRSJC-S4-MW15							
	Wells	Screen Interval (feet btoc)	17 to 27	17 to 27							
	Surface Soil	Station ID									
Sample Stations	Samples	Sample Depth (feet bgs)	Not sample	ed – asphalt							
	Subsurface	Station ID	NRSJC-S4-SB14	NRSJC-S4-SB15							
	Soil Samples	Sample Depth (feet bgs)	2 to 3; 16 to 17	16 to 17							
Site Lithology	Based on obser gravel and sand Appendix B .	vations from the so I. Soils become wet	oil borings at Site 4, the subsurfac at approximately 18 feet bgs. So	e lithology consists of silty il boring logs are provided in							
Site Hydrology	Jim Creek is app Jim Creek is bel	proximately 300 fee ieved to be in direc	et to the southwest and flows nor t hydraulic communication with a	thwest past Site 4 (Figure 2-8). groundwater at Site 4.							
	Groundwater a	t Site 4 is present ir	n an unconfined aquifer comprise	d of silty and clayey gravel.							

			SS			SB			GW boom of the second		
	Analyte	Frequency of Detection	Frequency of Exceedance	Maximum Concentration (µg/kg)	Frequency of Detection	Frequency of Exceedance	Maximum Concentration (µg/kg)	Frequency of Detection	Frequency of Exceedance	Maximum Concentration (ng/L)	
SI Results Compared to SLs	PFOA	NS	NS	NS	0/3	0/3	ND	0/2	0/2	ND	
	PFOS	NS	NS	NS	0/3	0/3	ND	0/2	0/2	ND	
	PFBS	NS	NS	NS	0/3	0/3	ND	0/2	0/2	ND	
	PFHxS	NS	NS	NS	0/3	0/3	ND	0/2	0/2	ND	
	PFNA	NS	NS	NS	0/3	0/3	ND	0/2	0/2	ND	
	HFPO-DA	NS	NS	NS	0/3	0/3	ND	0/2	0/2	ND	
Proximity to Base Boundary and Drinking Water Exposure Assessment	Site 4 (Met NRS Jim Cr north of NI and is belie west from Creek are r at Site 4. O	al Burial P eek (Figur RS Jim Cree eved to be the northy not impact ff-Base dri	it) is appro e 2-4). Sev ek. Upper in direct h vest corne ed by grou nking wat	oximately veral privat aquifer gr nydraulic c er of NRS J undwater er samplir	5,600 feet te drinking oundwate ommunica im Creek, from Site ng is not w	south of f water we flows to ation with off-installa PFAS we varranted a	the northe ells may ex the north Jim Creek ation prop ere not de at this time	ern installa kist within west para . Because erties nor tected in t e.	tion boun 1 mile to t llel to Jim (Jim Creek th of NRS . he ground	dary of che Creek flows Jim Iwater	
Results Summary, HHRS Findings, Conclusions, and Recommendations	PFAS were due to aspl Based on tl risks associ was not de site manag Based on tl PFOS, identif There	not detec halt surfac he HHRS, (iated with tected in s ement der ment der he followin PFOA, PFB y COPCs is no docu	ted in sub e. COPCs wei exposure site media cisions bas ng lines of S, PFHxS, mentatior	surface so re not ider to PFAS in . While PF sed on resi evidence, PFNA, and	il or grour ntified, ind soil and g BA was no ults and co additiona I HFPO-DA ase from t	ndwater. S licating the groundwat ot analyzed oncentrati I investiga were not he PA	urface soil ere are no er (Appen d under th ons at sim tion is not detected,	unaccept dix J). In a e SI, it is u ilar Navy s t recomme and the H	were not c able huma iddition, P nlikely to i sites. ended at tl IHRS did n	collected FHxA impact his time: ot	

Table 4-6. Site 4 (Metal Burial Pit) Conceptual Site Model

NS = Not sampled

4.7 Naval Radio Station Jim Creek Site 5 (Mixed Waste Landfill)

Table 4-7. Site 5 (Mixed Waste Landfill) Conceptual Site Model

Potential for PFAS Release. See Section 2.1.2 for Description and Operational History.	The PFAS PA (C available for re- landfill; howeve early as 1976 (C AFFF containers possible that th	H2M, 2021) identif view that would co er, according to a fo CH2M, 2021), while s is unknown. Beca ese containers we	ied Site 5 as a pot nfirm disposal of ormer fire chief, A the Site 5 landfill use waste was no re disposed of at 9	ential PFAS relea AFFF or other PFA FFF was being sto was in use, and to tremoved from to Site 5.	se area. Records v AS-containing che ored at Building 6 the final dispositio he installation pri	were not micals at the at least as on of these for to 1991, it is
SI Approach	 Soil and gro Site 5. New release are groundwat to 100 feet have been well was no Three surfa Figure 4-6) Five subsur bgs to 14 to monitoring hand-auge Three grou 	oundwater samples of monitoring well lo as (based on opera er sample was plar bgs on the upgrad impacted by debris of installed due to of ace soil samples we face soil samples we of 15 feet bgs (Table wells and one soil ring.	s were collected f bocations were sele ational history). D inned to be collect ient (north) side of deposited outsic drilling accessibilit ere collected from vere collected fro e 4-9; Figure 4-6). location near the	rom newly install ected near and do ue to the uncerta ed from a new m of the landfill to a le the mapped lan ty issues. three locations f m four locations f Samples were co downgradient la m three newly in:	ed monitoring we owngradient of lik inty of the landfill onitoring well to l ssess groundwate ndfill boundary. H rom 0 to 0.5 foot ranging in depth f illected from the t ndfill boundary ac	Il locations at ely PFAS extent, a be installed up er that may owever, this bgs (Table 4-9 ; rom 2 to 3 feet three new ccessible to a wells with
	screen inte Figure 4-6)	rvals ranging in de	pth from 11 to 21	feet btoc to 16.5	to 26.5 feet btoc	(Table 4-10;
	Monitoring	Well ID	NRSJC-S5- MW16	NRSJC-S5- MW18	NRSJC-S5- MW19	
	Wells	Screen Interval (feet btoc)	16.5 to 26.5	14 to 24	11 to 21	NS
	Surface Soil	Station ID	NRSJC-S5- SS16	NRSJC-S5- SS18	NRSJC-S5- SS19	
Sample Stations	Samples	Sample Depth (feet bgs)		0-0.5		
	Subsurface	Station ID	NRSJC-S5- SB16	NRSJC-S5- SB18	NRSJC-S5- SB19	NRSJC-S5- SB21
	Soil Samples	Sample Depth (feet bgs)	13 to 14	7 to 8 14 to 15	10 to 11	2 to 3
		NRSJC-S5-MV	V17 was not insta	lled due to access	sibility issues	
Site Lithology	Based on obser clayey gravel w provided in App	vations from the so ith interbedded silf pendix B .	oil borings at Site sy sand. Soils becc	5, the subsurface ome wet at 11 to	lithology consists 18 feet bgs. Soil b	s of silty and oring logs are
Site Hydrology	Jim Creek is app Jim Creek is bel	proximately 550 fee ieved to be in diree	et to the southwe ct hydraulic comm	st and flows nort nunication with gr	hwest past Site 5 roundwater at Site	(Figure 2-8). e 5.
Groundwater	Groundwater a Depth to groun measured at Sit northwest, app 5).	t Site 5 is present in dwater is between ie 5 and nearby Site roximately parallel	n an unconfined a approximately 13 e 4 on December to the flow of Jim	quifer comprised 3 and 19 feet bgs. 15, 2022, ground 1 Creek toward th	of silty sand and Based on synopti water flow is to the mouth of the va	silty gravel. ic water levels ne west- alley (Figure 3-

			SS	s		SB		GW		
	Analyte	Frequency of Detection	Frequency of Exceedance	Maximum Concentration (μg/kg)	Frequency of Detection	Frequency of Exceedance	Maximum Concentration (µg/kg)	Frequency of Detection	Frequency of Exceedance	Maximum Concentration (ng/L)
Compared to SLs	PFOA	0/3	0/3	ND	0/4	0/4	ND	0/3	0/3	ND
	PFOS	0/3	0/3	ND	0/4	0/4	ND	0/3	0/3	ND
	PFBS	0/3	0/3	ND	0/4	0/4	ND	0/3	0/3	ND
	PFHxS	0/3	0/3	ND	0/4	0/4	ND	0/3	0/3	ND
	PFNA	0/3	0/3	ND	0/4	0/4	ND	0/3	0/3	ND
	HFPO-DA	0/3	0/3	ND	0/4	0/4	ND	0/3	0/3	ND
Proximity to Base Boundary and Drinking Water Exposure Assessment	Site 5 (Mixe of NRS Jim north of NF and is belie from the no not impact Base drinki	ed Waste Creek (Fig S Jim Cree ved to be orthwest o ed by grou ng water s	Landfill) is ure 2-4). S ek. Upper in direct h corner of N undwater is campling is	approxim Several pri aquifer gr nydraulic c NRS Jim Cr from Site S s not warr	ately 5,400 vate drinkin oundwater f ommunicati eek, off-inst 5. PFAS were anted at this	feet south g water w flows to th on with Ji allation pr e not deten s time	of the nor ells may e le west-no m Creek. E operties n cted in the	rthern inst xist within rthwest p Because Jir orth of NF groundw	tallation b 1 mile to arallel to J n Creek flo RS Jim Cree ater at Sit	oundary the lim Creek ows west ek are e 5. Off-
	PFAS were	not detec	ted in surf	ace soil, s	ubsurface so	oil, or grou	ndwater.			
Results Summary, HHRS Findings, Conclusions, and Recommendations	Based on the risks associ not detected manageme Based on the Concert	ne HHRS, (ated with ed in site r nt decisio ne followin ntrations d	COPCs were exposure nedia. Wh ns based of ng lines of of PFOS die	re not ider to PFAS in ile PFBA won results evidence, d not exce	ntified, indic soil and gro vas not analy and concent additional i ed SLs, and	ating there oundwater yzed unde crations at nvestigations the HHRS	e are no un (Appendi r the SI, it similar Na on is not re did not ide	nacceptab x J). In add is unlikely ivy sites. ecommen entify COP	le human dition, PFF to impact ded at this Cs	health IxA was : site s time:

Table 4-7. Site 5 (Mixed Waste Landfill) Conceptual Site Model

4.8 Naval Recreation Complex Pacific Beach Building 106 (Former Fire Station)

Table 4-8. Building 106 (Former Fire Station) Conceptual Site Model

Potential for PFAS Release. See Section 2.1.2 for Description and Operational History.	The PFAS PA (0 interviews with release of AFF from the late 1 by the Navy. If of Building 100 and migrated t	CH2M, 2021) identi h former Navy emp F at this site. Howe 1950s through the AFFF transfer or w 5, AFFF or AFFF resi to nearby unpaved	ified Building 106 as a poloyees at NRC Pacific Ever, the operational tin 1980s, overlaps with the vashing of fire trucks of idual could have been started as with overland do a series with overland do	potential PFAS release Beach, there was no kr meframe of Building 10 ne timeframe in which ccurred on fire truck ra splashed or washed or rainage.	area. According to nown storage, use, or D6 as a fire station, AFFF has been in use mps east and west nto the pavement						
SI Approach	 Soil and g at Building PFAS relea on both si trucks pot 106. Three surf 0 to 1 0 fo 	roundwater sample g 106. New monito ase areas (based or des (east and west entially containing face soil samples w	es were collected from ring well locations wer operational history).) of the building in area AFFF occurred, and on ere collected from the Figure 4-7)	newly installed monitor e selected near and do Two wells are located as where AFFF transfer the well is downgradien three new monitoring	oring well locations owngradient of likely near the bay doors or washing of fire t (east) of Building well locations from						
	Three sub	 0 to 1.0 foot bgs (Table 4-9; Figure 4-7). Three subsurface soil samples were collected from three locations ranging in depth from 5 to 6 foot bgs to 12 to 14 foot bgs (Table 4 9: Figure 4 7). 									
	 6 feet bgs Three gro screen int Figure 4-7 	to 13 to 14 feet bg undwater samples ervals ranging in de).	is (Table 4-9; Figure 4-7 were collected from the epth from 6 to 16 feet	 ree newly installed me btoc to 11 to 21 feet b 	onitoring wells with toc (Table 4-10 ;						
	Monitoring	Well ID	NRCPB-B106- MW01	NRCPB-B106- MW02	NRCPB-B106- MW03						
	Wells	Screen Interval (feet btoc)	11 to 21	10 to 20	6 to 16						
Sample Stations	Surface Soil	Station ID	NRCPB-B106-SS01	NRCPB-B106-SS02	NRCPB-B106-SS03						
Sample Stations	Samples	Sample Depth (feet bgs)		0 to 1							
	Subsurface	Station ID	NRCPB-B106-SB01	NRCPB-B106-SB02	NRCPB-B106-SB03						
	Soil Samples	Sample Depth (feet bgs)	13 to 14	9 to 10	5 to 6						
Site Lithology	Based on obse to 10 feet of si gravel. Litholo become wet b	rvations from the s Ity sand and gravel gy transitions to sil etween 4 and 6 fee	oil borings at Building underlain by approxin t and clay dominant so et bgs. Soil boring logs	106, the subsurface lit nately 10 feet of sand il at approximately 20 are provided in Appen	hology consists of 5 and interbedded feet bgs. Soils dix B .						
Site Hydrology	The nearest hy approximately Pacific Ocean i	vdraulic feature is S 350 feet to the we s approximately 1,	South Ravine (Figure 2- est that runs south-sou 500 feet to the west.	10), an ephemeral dra thwest toward the Pac	inage feature cific Ocean. The						
Groundwater	Groundwater a Depth to groundw 2022, groundw (Figure 3-6).	at Building 106 is p ndwater is approxin vater flow in the vio	resent in an unconfine mately 12 feet bgs. Bas cinity of Building 106 is	d aquifer comprised of ed on water levels me to the west toward th	f sand and gravel. asured on August 9, ne Pacific Ocean						

			SS			SB			GW		
El Desulto Composed	Analyte	Frequency of Detection	Frequency of Exceedance	Maximum Concentration (µg/kg)	Frequency of Detection	Frequency of Exceedance	Maximum Concentration (µg/kg)	Frequency of Detection	GWJoJo2/30/32/30/33/32/30/30/32/30/30/30/30/30/30/30/30/30/30/30/30/30/30/30/30/30/3PFBS, PFHxS, PFNA,d PFHx were detectedunacceptable humarIix J). In addition, PFSI, it is unlikely to irar Navy sites.recommended at thdid not exceed SLs.did not exceed SLs.	Maximum Concentration (ng/L)	
to SLs	PFOA	0/3	0/3	ND	0/3	0/3	ND	2/3	0/3	3.61 J	
	PFOS	2/3	0/3	0.621 J	0/3	0/3	ND	3/3	2/3	14.1	
	PFBS	0/3	0/3	ND	0/3	0/3	ND	0/3	0/3	ND	
	PFHxS	0/3	0/3	ND	0/3	0/3	ND	2/3	0/3	3.7 J	
	PFNA	0/3	0/3	ND	0/3	0/3	ND	0/3	0/3	ND	
	HFPO-DA	0/3	0/3	ND	0/3	0/3	ND	0/3	0/3	ND	
Proximity to Base Boundary and Drinking Water Exposure Assessment	Building 10 boundary of NRC Pacific properties 70 ppt for F 106. Off-Ba	6 (Former of NRC Pac Beach. Ba are upgrad PFOA and use drinkin	Fire Station ific Beach ased on th dient from PFOS, indi g water sa	on) is appr (Figure 2- e upper ac Building 2 ividually or ampling is	oximately 10). Public quifer grou 106. USEP r combine not warra	100 feet c drinking undwater A lifetime d, was not nted at th	west of the water wel flow to the drinking w exceeded is time.	e eastern Is are with e west, off vater healt I in ground	installation in 1 mile e f-installation th advison dwater at	n east of on y of Building	
Results Summary, HHRS Findings, Conclusions, and Recommendations	PFOS was of HFPO-DA w PFAS were PFOS was of groundwat Based on th risks associ was not de site manag Based on th Ocncer in grou	letected in vere not d not detec letected in er below t ne HHRS, (ated with tected in s ement dea ne followin ntrations o indwater v is no docu	n surface s etected. ted in sub n groundw he SLs. PF COPCs we exposure site media cisions bas ng lines of of PFOS in was detec mentatior	soil at two surface so vater at tw BS, PFNA, re not ider to PFAS in . While PF sed on resu evidence, soil and Pl ted above n of a relea	locations il. o wells ab and HFPC soil and g BA was no ults and co additiona FOA and P the SLs; h ase from t	below the pove the SI D-DA was r licating the groundwat ot analyzed oncentrati il investiga PFHxS in gr owever, th he PA	SLS. PFOA a not detecto ere are no cer (Appen d under th ons at sim ation is not roundwate he HHRS d	nd PFHx w ed. unaccept dix J). In a e SI, it is u ilar Navy s t recomme r did not iden	HxS, PFNA vere detec able huma addition, P nlikely to sites. ended at tl exceed SLs ntify COPC	ted in the health FHxA impact his time: 5. PFOS Ss	

Table 4-8. Building 106 (Former Fire Station) Conceptual Site Model

Site Inspection Report for Per- and Polyfluoroalkyl Substances at Naval Station Everett, Everett, Washington,

Naval Radio Station Jim Creek, Arlington, Washington, and

				PFAS Analyte (µg/kg)						
Sample Station	Sample ID	Sample Depth (ft bgs)	Sample Date and Time	PFOA	PFOS	PFBS	PFHxS	PFNA	HFPO-DA	PFHxA
		Residentia	al Soil Screening Level	19	13	1,900	130	19	23	3200*
Naval Station Everett										
Building 2114 (Fire Stat	ion)									
	NSE-B2114-SS01-0001	0.0-1.0	7/26/2022 11:10	0.501 U	34.5	0.501 U	2.77	0.501 U	0.501 U	0.501 U
NSE-B2114-MW-01	NSE-B2114-SS01P-0001	0.0-1.0	7/26/2022 11:12	0.501 U	30.9	0.501 U	2.15	0.501 U	0.501 U	0.207 J
	NSE-B2114-SB01-0910	9.0-10	7/27/2022 11:30	0.5 U	0.636 J	0.5 U				
NSE_B211/_M\\/_02	NSE-B2114-SS02-0001	0.0-1.0	7/26/2022 14:58	0.35 J	14.8 J	0.501 U	0.982 J	0.24 J	0.501 U	0.436 J
N3L-D2114-WW-02	NSE-B2114-SB02-1920	19-20	7/27/2022 15:45	0.498 U	0.208 J	0.498 U				
NSF_B211/_M\\/_03	NSE-B2114-SS03-0001	0.0-1.0	7/27/2022 8:35	0.5 U	0.399 J	0.5 U				
N3L-B2114-WW-03	NSE-B2114-SB03-1920	19-20	7/28/2022 14:40	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U
Naval Radio Station Jim	n Creek									
Building 6 (Former Fire	Station)									
	NRSJC-B6-SB01-0102	1.0-2.0	6/1/2022 15:20	0.501 U	0.501 U	0.501 U	0.751 J	0.501 U	0.501 U	0.318 J
111336-00-10100-01	NRSJC-B6-SB01-2930	29-30	6/2/2022 11:55	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	NRSJC-B6-SS02-000H	0.0-0.5	5/24/2022 8:45	0.502 U	0.313 J	0.502 U				
101030-00-10100-02	NRSJC-B6-SB02-3637	36-37	6/3/2022 13:00	0.494 U	0.494 U	0.494 U	0.494 U	0.494 U	0.494 U	0.494 U
	NRSJC-B6-SS03-000H	0.0-0.5	6/6/2022 15:20	0.502 U	0.502 U	0.502 U	0.502 U	0.502 U	0.502 U	0.502 U
NRSJC-B6-MW-03	NRSJC-B6-SS03P-000H	0.0-0.5	6/6/2022 15:25	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U
	NRSJC-B6-SB03-2930	29-30	6/7/2022 16:45	0.502 U	0.502 U	0.502 U	0.502 U	0.502 U	0.502 U	0.502 U
	NRSJC-B6-SS04-000H	0.0-0.5	6/8/2022 14:45	0.533 U	0.356 J	0.356 J	2.59	0.533 U	0.533 U	0.533 U
NRSJC-B6-MW-04	NRSJC-B6-SB04-2728	27-28	6/9/2022 11:10	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U
	NRSJC-B6-SB04-2930	29-30	6/9/2022 11:15	0.502 U	0.502 U	0.502 U	0.502 U	0.502 U	0.502 U	0.502 U
Site 1 (Building 11 Land	fill)									
	NRSJC-S1-SS05-000H	0.0-0.5	5/24/2022 11:23	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U
101/336-31-10100-03	NRSJC-S1-SB05-3H4H	3.5-4.5	6/16/2022 15:00	0.513 U	0.513 U	0.513 U	0.513 U	0.513 U	0.513 U	0.513 U
	NRSJC-S1-SS06-000H	0.0-0.5	5/24/2022 11:04	0.5 U	0.218 J	0.5 U				
NRSJC-S1-MW-06	NRSJC-S1-SB06-0708	7.0-8.0	6/20/2022 16:50	0.506 U	0.506 U	0.506 U	0.506 U	0.506 U	0.506 U	0.506 U
	NRSJC-S1-SB06-2526	25-26	6/21/2022 14:35	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U

Site Inspection Report for Per- and Polyfluoroalkyl Substances at Naval Station Everett, Everett, Washington,

Naval Radio Station Jim Creek, Arlington, Washington, and

				PFAS Analyte (μg/kg)						
Sample Station	Sample ID	Sample Depth (ft bgs)	Sample Date and Time	PFOA	PFOS	PFBS	PFHxS	PFNA	HFPO-DA	PFHxA
		Residentia	al Soil Screening Level	19	13	1,900	130	19	23	3200*
	NRSJC-S1-SS07-000H	0.0-0.5	5/24/2022 11:31	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U
NR3JC-31-IVIV-07	NRSJC-S1-SB07-0304	3.0-4.0	6/17/2022 12:30	0.513 U	0.513 U	0.513 U	0.513 U	0.513 U	0.513 U	0.513 U
	NRSJC-S1-SS20-000H	0.0-0.5	5/24/2022 12:06	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U
NRSJC-S1-SB-20	NRSJC-S1-SB20-0203	2.0-3.0	5/24/2022 13:51	0.498 U	0.498 U	0.498 U	0.498 U	0.498 U	0.498 U	0.498 U
	NRSJC-S1-SB20P-0203	2.0-3.0	5/24/2022 13:52	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Site 6 (Blue Campgroun	d Landfill)				-					
	NRSJC-S6-SS08-000H	0.0-0.5	5/24/2022 15:39	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U
INK3JC-30-IVIVV-08	NRSJC-S6-SB08-3H04	3.5-4.0	6/15/2022 10:00	0.503 U	0.503 U	0.503 U	0.503 U	0.503 U	0.503 U	0.503 U
	NRSJC-S6-SS09-000H	0.0-0.5	5/24/2022 14:48	0.497 U	0.284 J	0.497 U				
101/3/2-30-101/0-09	NRSJC-S6-SB09-3H05	3.5-5.0	6/15/2022 14:15	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	NRSJC-S6-SS10-000H	0.0-0.5	5/24/2022 15:28	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U
NRSJC-S6-MW-10	NRSJC-S6-SB10-1415	14-15	6/10/2022 13:50	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U
	NRSJC-S6-SB10P-1415	14-15	6/10/2022 13:55	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Site 7 (Pit Road Landfill))									
	NRSJC-S1-SS11-000H	0.0-0.5	11/1/2022 11:30	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U
	NRSJC-S1-SS11P-000H	0.0-0.5	11/1/2022 9:00	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U
	NRSJC-S1-SB11-42H43H	42.5-43.5	11/1/2022 9:05	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
NRSJC-S7-MW-11	NRSJC-S1-SB11-9394	93-94	11/1/2022 15:15	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	NRSJC-S1-SB11-146147	146-147	11/2/2022 11:00	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	NRSJC-S1-SB11-191192	191-192	11/2/2022 14:40	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U
	NRSJC-S1-SB11-231232	231-232	11/3/2022 11:00	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	NRSJC-S7-SS12-000H	0.0-0.5	10/7/2022 9:45	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	NRSJC-S7-SB12-9697	96-97	10/5/2022 11:10	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
NRSIC-S7-MW-12	NRSJC-S7-SB12-145146	145-146	10/5/2022 16:00	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	NRSJC-S7-SB12-174175	174-175	10/6/2022 14:00	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U
	NRSJC-S7-SB12-210211	210-211	10/6/2022 15:20	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	NRSJC-S7-SB12-229230	229-230	10/10/2022 12:55	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U

Site Inspection Report for Per- and Polyfluoroalkyl Substances at Naval Station Everett, Everett, Washington,

Naval Radio Station Jim Creek, Arlington, Washington, and

				PFAS Analyte (µg/kg)						
Sample Station	Sample ID	Sample Depth (ft bgs)	Sample Date and Time	PFOA	PFOS	PFBS	PFHxS	PFNA	HFPO-DA	PFHxA
		Residentia	al Soil Screening Level	19	13	1,900	130	19	23	3200*
	NRSJC-S1-SS07-000H	0.0-0.5	5/24/2022 16:04	0.502 U	0.502 U	0.502 U	0.502 U	0.502 U	0.502 U	0.502 U
	NRSJC-S7-SB13-3839	38-39	10/13/2022 17:00	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U
	NRSJC-S7-SB13-8485	84-85	10/14/2022 10:35	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U
NRSJC-S7-MW-13	NRSJC-S7-SB13-128129	128-129	10/25/2022 16:15	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
	NRSJC-S7-SB13-177178	177-178	10/25/2022 12:25	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U
	NRSJC-S7-SB13-215216	215-216	10/27/2022 8:30	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U
	NRSJC-S7-SB13P-215216	215-216	10/27/2022 8:30	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U	0.5 U
Site 4 (Metal Burial Pit)									
	NRSJC-S4-SB14-0203	2.0-3.0	6/29/2022 11:15	0.498 U	0.498 U	0.498 U	0.498 U	0.498 U	0.498 U	0.498 U
INKSJC-54-IVI VV-14	NRSJC-S4-SB14-1718	17-18	6/29/2022 15:20	0.487 U	0.487 U	0.487 U	0.487 U	0.487 U	0.487 U	0.487 U
NRSJC-S4-MW-15	NRSJC-S4-SB15-1617	3.5-5.0	6/30/2022 14:25	0.494 U	0.494 U	0.494 U	0.494 U	0.494 U	0.494 U	0.494 U
Site 5 (Mixed Waste La	indfill)									
	NRSJC-S5-SS16-000H	0.0-0.5	5/25/2022 10:07	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U
101232-10100-10	NRSJC-S5-SB16-1314	13-14	6/27/2022 12:15	0.502 U	0.502 U	0.502 U	0.502 U	0.502 U	0.502 U	0.502 U
	NRSJC-S5-SS18-000H	0.0-0.5	5/25/2022 11:43	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U
	NRSJC-S5-SB18-0708	7.0-8.0	6/22/2022 14:45	0.511 U	0.511 U	0.511 U	0.511 U	0.511 U	0.511 U	0.511 U
101232-32-10100-18	NRSJC-S5-SB18-1415	14-15	6/22/2022 14:50	0.498 U	0.498 U	0.498 U	0.498 U	0.498 U	0.498 U	0.498 U
	NRSJC-S5-SB18P-1415	14-15	6/22/2022 14:55	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U	0.499 U
	NRSJC-S5-SS19-000H	0.0-0.5	5/25/2022 11:15	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U	0.501 U
101232-10100-13	NRSJC-S5-SB19-1011	10-11	6/23/2022 15:40	0.491 U	0.491 U	0.491 U	0.491 U	0.491 U	0.491 U	0.491 U
NRSJC-S5-SB-21	NRSJC-S5-SB21-0203	2.0-3.0	5/25/2022 10:48	0.502 U	0.502 U	0.502 U	0.502 U	0.502 U	0.502 U	0.502 U
Naval Recreation Com	olex Pacific Beach									
Building 106 (Former F	ire Station)									
	NRCPB-B106-SS01-0001	0.0-1.0	8/3/2022 10:30	0.502 U	0.26 J	0.502 U				
NRCPB-B106-MW-01	NRCPB-B106-SS01P-0001	0.0-1.0	8/3/2022 10:35	0.498 U	0.498 U	0.498 U	0.498 U	0.498 U	0.498 U	0.498 U
	NRCPB-B106-SB01-1314	13-14	8/3/2022 16:50	0.502 U	0.502 U	0.502 U	0.502 U	0.502 U	0.502 U	0.502 U

Site Inspection Report for Per- and Polyfluoroalkyl Substances at Naval Station Everett, Everett, Washington,

Naval Radio Station Jim Creek, Arlington, Washington, and

Naval Recreation Complex Pacific Beach, Pacific Beach, Washington

				PFAS Analyte (μg/kg)						
Sample Station	Sample ID	Sample Depth (ft bgs)	Sample Date and Time	PFOA	PFOS	PFBS	PFHxS	PFNA	HFPO-DA	PFHxA
Residential Soil Screening Level			19	13	1,900	130	19	23	3200*	
	NRCPB-B106-SS02-0001	0.0-1.0	8/3/2022 11:00	0.502 U	0.502 U	0.502 U	0.502 U	0.502 U	0.502 U	0.502 U
	NRCPB-B106-SB02-0910	9.0-10	8/4/2022 9:40	0.498 U	0.498 U	0.498 U	0.498 U	0.498 U	0.498 U	0.498 U
	NRCPB-B106-SS03-0001	0.0-1.0	8/8/2022 12:00	0.499 U	0.621 J	0.499 U				
INFCED-0100-INIM-03	NRCPB-B106-SB03-0506	5.0-6.0	8/8/2022 13:40	0.498 U	0.498 U	0.498 U	0.498 U	0.498 U	0.498 U	0.498 U

Bolded text indicates detection.

Shaded text indicates exceedance of Residential Soil Screening Level (SL).

*= May 2023 SL for PFHxA

µg/kg = micrograms per kilogram

ft bgs = feet below ground surface

HFPO-DA = hexafluoropropylene oxide dimer acid

ID = identification

J = Analyte present, value may or may not be accurate or precise.

PFAS = per- and polyfluoroalkyl substances

PFBS = perfluorobutanesulfonic acid

PFHxS = perfluorohexanesulfonic acid

PFNA = perfluorononanoic acid

PFOA = perfluorooctanoic acid

PFOS = perfluorooctane Sulfonate

U = The material was analyzed for, but not detected.

Site Inspection Report for Per- and Polyfluoroalkyl Substances at Naval Station Everett, Everett, Washington,

Naval Radio Station Jim Creek, Arlington, Washington, and

				PFAS Analyte (ng/L)						
Sample Station	Sample ID	Sample Date and Time	Screen Depth (ft btoc)	PFOA	PFOS	PFBS	PFHxS	PFNA	HFPO-DA	PFHxA
		USEPA Lifetime Hea	lth Advisory	70	70					
		Tapwater Scre	ening Level	6.0	4.0	600	39	5.9	6.0	990*
Naval Station Everett										
Building 2114 (Fire Stat	tion)									
NSE-B2114-MW01	NSE-B2114-GW01-0822	8/11/2022 17:40	9-19	8.9	514	10.1	223	1.93 J	2.64 U	13.9
NSE-B2114-MW01	NSE-B2114-GW01P-0822	8/11/2022 17:45	9-19	9.47	516	10.6	224	2.19 J	2.51 U	15.4
NSE-B2114-MW02	NSE-B2114-GW02-0822	8/11/2022 19:30	19-29	12.9	6.79 J	14.3	59.6	0.869 J	2.56 U	13.3
NSE-B2114-MW03	NSE-B2114-GW03-0822	8/11/2022 18:45	15-25	5.19	3.3 J	7.97	4.29 J	2.41 U	2.41 U	8.63
Naval Radio Station Jin	n Creek									
Building 6 (Former Fire	Station)									
NRSJC-B6-MW01	NRSJC-B6-GW01-0622	6/30/2022 10:20	30-40	1.33 J	4.22 J	1.04 J	1.49 J	2.33 U	2.33 U	2.33 U
NRSJC-B6-MW02	NRSJC-B6-GW02-0622	6/30/2022 12:55	25-35	2.2 J	18.3 J	2.64 J	7.34	2.4 U	2.4 U	2.63 J
NRSJC-B6-MW03	NRSJC-B6-GW03-0622	6/30/2022 14:55	28.5-38.5	2.97 J	16.5	17.4	153	2.4 U	2.4 U	11.7
NRSJC-B6-MW04	NRSJC-B6-GW04-0722	7/1/2022 9:45	30-40	2.36 J	60.6	5.46	32.1	2.21 U	2.21 U	3.95 J
Site 1 (Building 11 Land	lfill)									
NRSJC-S1-MW05	NRSJC-S1-GW05-0722	7/11/2022 17:00	4.0-14	2.22 J	2.31 U	1.29 J	2.31 U	2.31 U	2.31 U	2.31 U
NRSJC-S1-MW06	NRSJC-S1-GW06-0722	7/11/2022 14:45	28.5-38.5	2.28 U	2.28 U	2.28 U	2.28 U	2.28 U	2.28 U	2.28 U
NRSJC-S1-MW07	NRSJC-S1-GW07-0722	7/12/2022 11:35	4.0-14	2.27 U	2.27 U	2.27 U	2.27 U	2.27 U	2.27 U	2.27 U
NRSJC-S1-MW07	NRSJC-S1-GW07P-0722	7/12/2022 11:37	4.0-14	1.09 J	2.31 U	2.31 U	2.31 U	2.31 U	2.31 U	2.31 U

Site Inspection Report for Per- and Polyfluoroalkyl Substances at Naval Station Everett, Everett, Washington,

Naval Radio Station Jim Creek, Arlington, Washington, and

				PFAS Analyte (ng/L)						
Sample Station	Sample ID	Sample Date and Time	Screen Depth (ft btoc)	PFOA	PFOS	PFBS	PFHxS	PFNA	HFPO-DA	PFHxA
	•	USEPA Lifetime Health Advisory		70	70					
	6.0	4.0	600	39	5.9	6.0	990*			
Site 6 (Blue Campgrour										
NRSJC-S6-MW08	NRSJC-S6-GW08-0722	7/13/2022 13:05	4.0-14	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U
NRSJC-S6-MW09	NRSJC-S6-GW09-0722	7/12/2022 12:50	4.0-14	2.19 U	2.19 U	2.19 U	2.19 U	2.19 U	2.19 U	2.19 U
NRSJC-S6-MW09	NRSJC-S6-GW09P-0722	7/12/2022 12:52	4.0-14	1.24 J	2.16 U	2.16 U				
NRSJC-S6-MW10 NRSJC-S6-GW10-0722		7/13/2022 12:00	14-24	2.43 U	2.43 U	2.43 U	2.43 U	2.43 U	2.43 U	2.43 U
Site 7 (Pit Road Landfill)										
NRSJC-S7-MW11	NRSJC-S7-GW11-1122	11/9/2022 15:15	234-244	2.31 U	2.31 U	2.31 U	2.31 U	2.31 U	2.31 U	2.31 U
NRSJC-S7-MW11	NRSJC-S7-GW11P-1122	11/9/2022 15:20	234-244	2.69 U	2.69 U	2.69 U	2.69 U	2.69 U	2.69 U	2.69 U
NRSJC-S7-MW12 NRSJC-S7-GW12A-1122 11/		11/10/2022 13:35	233-243	2.68 U	2.68 U	2.68 U	2.68 U	2.68 U	2.68 U	2.68 U
NRSJC-S7-MW13 Not sampled, well dry NA		NA	217-237	NA	NA	NA	NA	NA	NA	NA
Site 4 (Metal Burial Pit)	Site 4 (Metal Burial Pit)									
NRSJC-S4-MW14	NRSJC-S4-GW14-0722	7/13/2022 14:20	17-27	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U	2.4 U
NRSJC-S4-MW14	NRSJC-S4-GW14P-0722	7/13/2022 14:22	7.0-17	2.34 U	2.34 U	2.34 U	2.34 U	2.34 U	2.34 U	2.34 U
NRSJC-S4-MW15	NRSJC-S4-GW15-0722	7/13/2022 15:15	17-27	2.25 U	2.25 U	2.25 U	2.25 U	2.25 U	2.25 U	2.25 U
Site 5 (Mixed Waste Landfill)										
NRSJC-S5-MW16	NRSJC-S5-GW16-0722	7/12/2022 15:30	16.5-26.5	2.44 U	2.44 U	2.44 U	2.44 U	2.44 U	2.44 U	2.44 U
NRSJC-S5-MW16	NRSJC-S5-GW16P-0722	7/12/2022 15:32	16.5-26.5	2.36 U	2.36 U	2.36 U	2.36 U	2.36 U	2.36 U	2.36 U
NRSJC-S5-MW18	7/13/2022 9:40	14-24	2.38 U	2.38 U	2.38 U	2.38 U	2.38 U	2.38 U	2.38 U	
NRSJC-S5-MW-19	NRSJC-S5-GW19-0722	7/12/2022 10:40	11-21	2.34 U	2.34 U	2.34 U	2.34 U	2.34 U	2.34 U	2.34 U

Site Inspection Report for Per- and Polyfluoroalkyl Substances at Naval Station Everett, Everett, Washington,

Naval Radio Station Jim Creek, Arlington, Washington, and

Naval Recreation Complex Pacific Beach, Pacific Beach, Washington

				PFAS Analyte (ng/L)						
Sample Station Sample ID		Sample Date and Time	Screen Depth (ft btoc)	PFOA	PFOS	PFBS	PFHxS	PFNA	HFPO-DA	PFHxA
		th Advisory	70	70						
Tapwater Screening Level 6.0 4.0 600 39 5.9 6.0									990*	
Naval Recreation Comp	laval Recreation Complex Pacific Beach									
Building 106 (Former Fire Station)										
NRCPB-B106-MW-01	NRCPB-B106-GW01-0822	8/9/2022 11:40	11-21	3.61 J	2.9 J	2.71 U	3.7 J	2.71 U	2.71 U	2.71 U
NRCPB-B106-MW-01 NRCPB-B106-GW01P-0822 8/9/2022 11:45 11-21 3.42 J 2.55 J 2.55 J 3.21 J 2.55 U 2.55 U 2.55 U								2.55 U	2.55 U	
NRCPB-B106-MW-02	NRCPB-B106-GW02-0822	8/9/2022 12:40	10-20	2.08 J	5.53 J	2.46 U	2.46 U	2.46 U	2.46 U	2.05 J
NRCPB-B106-MW-03	NRCPB-B106-GW03-0822	8/10/2022 10:35	6.0-16	2.5 U	14.1	2.5 U	2.4 J	2.5 U	2.5 U	2.5 U

Bolded text indicates detection.

Shaded text indicates exceedance of Tapwater Screening Level (SL).

*= May 2023 SL for PFHxA

ft btoc = feet below top of casing

HFPO-DA = hexafluoropropylene oxide dimer acid

ID = identification

J = Analyte present, value may or may not be accurate or precise.

ng/L = nanograms per liter

PFAS = per- and polyfluoroalkyl substances

PFBS = perfluorobutanesulfonic acid

PFHxS = perfluorohexanesulfonic acid

PFNA = perfluorononanoic acid

PFOA = perfluorooctanoic acid

PFOS = perfluorooctane Sulfonate

U = The material was analyzed for, but not detected.

USEPA = United States Environmental Protection Agency

20		Location				NSE-B2114-MW-01		
	the state of the s	Sample		NSE-B2114-GW01-0822	NSE-B2114-GW01P-0822	NSE-B2114-SS01-0001	NSE-B2114-SS01P-0001	NSE-B2114-SB01-0910
		Sample Date/ Time Screen Interval* (ft htoc)/Sample Denth** (ft has)	8/11/2022 17:40 9.0-19*	8/11/2022 17:45 9 0-19*	//26/2022 11:10	//26/2022 11:12	//2//2022 11:30 9.0-10**
		Media/Units	,, sumple Deptil (jt bgs)	Groundwater (ng/L)	Groundwater (ng/L)	Surface Soil (μg/kg)	Surface Soil (μg/kg)	Subsurface Soil (µg/kg)
	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		2022 EPA RSL					
	Or shi h	(Groundw	ater [ng/L]/Soil [µg/kg])	8.0	9.47	0 501 11	0 501 11	0.5.11
1000	de la	PFOS	4.0/13	514	516	34.5	30.9	0.636 J
		PFBS	600/1,900	10.1	10.6	0.501 U	0.501 U	0.5 U
15	5	PFHxS	39/130	223	224	2.77	2.15	0.5 U
and the		PFNA HEPO-DA	<u>5.9/19</u> 6.0/23	1.93 J	2.19 J	0.501 U	0.501 U	0.5 0
			0.0/25	2.040	2.510	0.5010	0.3010	0.5 0
				ALL BALL	a the second			City and
					States Har			CONTRACT OF
Sample		NSF-B2114-GW02-0822	NSE-B2114-MW-02	SE-B2114-SB02-1920			18	and the
Sample D	Date/Time	8/11/2022 19:30	7/26/2022 14:58	7/27/2022 15:45	A CONTRACTOR			1
Screen In	terval* (ft btoc)/Sample Depth** (ft bgs)	19-29*	0.0-1.0**	19-20**	A 44 1		Stat	1 Alexandress
Media/U	nits	Groundwater (ng/L)	Surface Soil (µg/kg) Su	ıbsurface Soil (μg/kg)			10 10 18 V	10 11
	2022 EPA RSL (Groundwater [na/l1/Soil [ua/ka])			\sim		A STR.	A15-	and the second
PFOA	6.0/19	12.9	0.35 J	0.498 U		24 A. 199	89	
PFOS	4.0/13	6.79 J	14.8 J	0.208 J			and they	
PFBS	600/1,900	14.3	0.501 U	0.498 U		- Martin	10 . To	
PFNA	5,9/19	0.869 J	0.982 J	0.498 U	K/	APR -	2	
HFPO-DA	6.0/23	2.56 U	0.501 U	0.498 U	1 10 1	100		A.
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1		Bresslend		<u>/</u>		NOTES: Bolded text in Shaded indica EPA = United	ndicates detection tes exceedance of screer States Environmental Pro	ning level bection Agency
		Spine Spine and				NOTES: Bolded text in Shaded indica EPA = United ft bgs = feet bd ft btoc = feet bd	ndicates detection tes exceedance of screer States Environmental Pro elow ground surface elow to of casing	ning level otection Agency
		SPIRE SPIRE				NOTES: Bolded text in Shaded indica EPA = United ft bgs = feet be ft btoc = feet b HFPO-DA = h	Adicates detection tes exceedance of screer States Environmental Pro- elow ground surface elow top of casing exafluoropropylene oxide	ning level btection Agency dimer acid
	15	SPUBLE BOBOR				NOTES: Bolded text in Shaded indica EPA = United ft bgs = feet be ft btoc = feet b HFPO-DA = he J = Analyte pre NAVSTA = Nar	Adicates detection tes exceedance of screer States Environmental Pro- elow ground surface elow top of casing exafluoropropylene oxide seent, value may or may in val Station	hing level otection Agency dimer acid not be accurate or precise
	15	Solution	15			NOTES: Bolded text in Shaded indica EPA = United ft bgs = feet be ft btoc = feet b HFPO-DA = he J = Analyte pre NAVSTA = Nar ng/L = nanogra	Adicates detection tes exceedance of screer States Environmental Prr elow ground surface elow top of casing exafluoropropylene oxide essent, value may or may to val Station ams per liter Recreation Complex	hing level otection Agency dimer acid not be accurate or precise
	15	SPURCE BOLONIA	13			NOTES: Bolded text in Shaded indica EPA = United ft btoc = feet b HFPO-DA = h J = Analyte pro NAVSTA = Nav ng/L = nanogra NRC = Naval I NRS = Naval I	Adicates detection tes exceedance of screer States Environmental Pro- elow ground surface elow top of casing exafluoropropylene oxide esent, value may or may f val Station ams per liter Recreation Complex Radio Station	hing level otection Agency dimer acid not be accurate or precise
	15	StraceSolean	5			NOTES: Bolded text in Shaded indica EPA = United ft bgs = feet ba ft btoc = feet b HFPO-DA = ha J = Analyte pre NAVSTA = Nar ng/L = nanogra NRC = Naval I PFAS = per- a PFBS = perfu	Adicates detection tes exceedance of screer States Environmental Pro- elow ground surface elow top of casing exafluoropropylene oxide seent, value may or may in val Station ams per liter Recreation Complex Radio Station and polyfluoroalkyl Substa porobutanesulfonic acid	hing level otection Agency dimer acid not be accurate or precise
	15	Solution Balant	*			NOTES: Bolded text in Shaded indica EPA = United ft bgs = feet b HFPO-DA = he J = Analyte pre NAVSTA = Nava ng/L = nanogra NRC = Naval H PFAS = perfu PFHAS = perflu	Adicates detection tes exceedance of screer States Environmental Pro Jelow ground surface elow top of casing exafluoropropylene oxide ssent, value may or may in val Station ams per liter Recreation Complex Radio Station and polyfluoroalkyl Substa probutanesulfonic acid	Aning level Detection Agency dimer acid not be accurate or precise
	15	Strace Baland	200			NOTES: Bolded text in Shaded indica EPA = United ft bgs = feet be ft btoc = feet b HFPO-DA = he J = Analyte pro NAVSTA = Nav ng/L = nanogra NRC = Naval I NRS = Naval I PFAS = perfu PFHXS = perflu PFNA = perflu PFOA = perflu	Adicates detection tes exceedance of screer States Environmental Pro- elow ground surface elow top of casing exafluoropropylene oxide esent, value may or may f val Station ams per liter Recreation Complex Radio Station and polyfluoroalkyl Substa porobutanesulfonic acid uorohexane sulfonate poronanoic acid porooctanoic acid	hing level otection Agency dimer acid not be accurate or precise
	15	Strace Bolenak	5			NOTES: Bolded text in Shaded indica EPA = United ft bgs = feet bd ft btoc = feet b HFPO-DA = hd J = Analyte pre NAVSTA = Nar ng/L = nanogra NRC = Naval I PFAS = perflu PFNA = perflu PFOA = perflu PFOA = perflu RSL = regiona	Adicates detection tes exceedance of screer States Environmental Pro- elow ground surface elow top of casing exafluoropropylene oxide sesent, value may or may to val Station ams per liter Recreation Complex Radio Station and polyfluoroalkyl Substa probutanesulfonic acid uorohexane sulfonate prononanoic acid porooctane sulfonate l screening level	hing level otection Agency dimer acid not be accurate or precise nces
	15	Solution Balant	25			NOTES: Bolded text in Shaded indica EPA = United ft bgs = feet be ft btoc = feet b HFPO-DA = he J = Analyte pre NAVSTA = Naval NRC = Naval NRC = Naval PFAS = perfu PFAS = perfu PFAS = perfu PFAS = perfu PFAS = perfu PFOA = perflu PFOS = perflu RSL = regiona U = The mater µg/kg = microg	Adicates detection tes exceedance of screer States Environmental Pre- elow ground surface elow top of casing exafluoropropylene oxide seent, value may or may to val Station ams per liter Recreation Complex Radio Station and polyfluoroalkyl Substa probutanesulfonic acid uorohexane sulfonate orooctanoic acid orooctane sulfonate I screening level ial was analyzed for, but grams per kilogram	hing level otection Agency dimer acid not be accurate or precise nces
	10	Strate Baland	23			NOTES: Bolded text in Shaded indica EPA = United ft bgs = feet be ft bloc = feet b HFPO-DA = he J = Analyte pre NAVSTA = Nav ng/L = nanogra NRC = Naval I NRS = Naval I PFAS = per- a PFBS = perflu PFNA = perflu PFOA = perflu PFOA = perflu RSL = regiona U = The mater µg/kg = micros	Adicates detection tes exceedance of screer States Environmental Pro- elow ground surface elow top of casing exafluoropropylene oxide essent, value may or may fr val Station ams per liter Recreation Complex Radio Station and polyfluoroalkyl Substa probutanesulfonic acid uorohexane sulfonate poronanoic acid porooctane sulfonate l screening level ial was analyzed for, but grams per kilogram	hing level otection Agency dimer acid not be accurate or precise nces
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LEGEND

- Monitoring Well and Soil Sample Location
- Stormwater Catch Basin
 - 5' Topographic Contours
- --> Groundwater Flow Direction
- > Anticipated Overland Water Flow Direction
- ---- Road Centerline
- Potential PFAS Release Area
- Installation Boundary

Figure 4-1 PFAS Soil and Groundwater Results: NAVSTA Everett, Building 2114 *Site Inspection for PFAS NAVSTA Everett, NRS Jim Creek, NRC Pacific Beach, Washington*



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PFOS	4.0/13	60.6	0.356 J	0.501 U	0.502 U					
PFBS	600/1,900	5.46	0.356 J	0.501 U	0.502 U		and the second		A COMPANY AND	
	<u>39/130</u> 5 9/19	32.1	2.59 0.533 U	0.501 U	0.502 U					i com
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							2022 EPA RSL			
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	And the second second second					PFOS	4.0/13	18.3 J	0.313 J	0.494 U
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NOTES: Bolded text indicates detection Shaded indicates exceedance of screening level EPA = United States Environmental Protection Agency ft bgs = feet below ground surface ft btoc = feet below top of casing HFPO-DA = hexafluoropropylene oxide dimer acid J = Analyte present, value may or may not be accurate or precise NAVSTA = Naval Station ng/L = nanograms per liter

NRC = Naval Recreation Complex NRS = Naval Radio Station

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PFAS = per- and polyfluoroalkyl Substances PFBS = perfluorobutanesulfonic acid PFHxS = perfluorohexane sulfonate PFNA = perfluorononanoic acid PFOA = perfluorooctanoic acid PFOS = perfluorooctane sulfonate RSL = regional screening level U = The material was analyzed for, but not detected μg/kg = micrograms per kilogram

IMAGERY SOURCE: ESRI ArcGIS Online Web Service, World Imagery, Maxar, 2021 Contours derived from USGS National Elevation Dataset

BLUE MOUNTAIN Twin Lakes NRS JIM CREEK OLO

LEGEND

- Monitoring Well and Soil Sample Location
- Stormwater Catch Basin ۲
- Unpaved Ditch ____
- Surface Waterbodies
- Groundwater Flow Direction
- > Anticipated Overland Water Flow Direction
 - 5' Topographic Contours
- **Road Centerline**
 - Potential PFAS Release Area
- Installation Boundary

Figure 4-2 PFAS Soil and Groundwater Results: NRS Jim Creek, Building 6 Site Inspection for PFAS NAVSTA Everett, NRS Jim Creek, NRC Pacific Beach, Washington


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Sample Da	te/Time	7/11/2022 17:00	5/24/2022 11:23	6/16/2022 15:00	\mathbf{X}	Sample Date/Time			7/11/2022
Screen Inte	erval* (ft btoc)/ Sample Depth ** (ft bqs)	4.0-14*	0.0-0.5**	3.5-4.5**			Screen Inte	erval* (ft btoc)/Sample Depth** (ft bgs)	28.5-38.5
Media/Un	its	Groundwater (ng/L)	Surface Soil (µa/ka)	Subsurface Soil (µa/ka)		1	Media/Un	its	Groundwater
	2022 FPA RSI		y (15) 57	, , , , , , , , , , , , , , , , , , ,		1		2022 EPA RSL	
	(Groundwater [ng/I]/ Soil [ug/kg])						1	(Groundwater [ng/L]/Soil [μg/kg])	
	(Groundwater [ng/1]/ Son [µg/xg]/	2 22 1	0 501 11	0 512 11			PFOA	6.0/19	2.28 U
PFUA	0.0/19	Z.22 J	0.501.0	0.515.0		\mathbf{i}	PFOS	4.0/13	2.28 U
PFOS	4.0/13	2.31 U	0.501 U	0.513 U			PFBS	600/1.900	2.28 U
PFBS	600/1,900	1.29 J	0.501 U	0.513 U			PFHxS	39/130	2.28 U
PFHxS	39/130	2.31 U	0.501 U	0.513 U			PFNA	5.9/19	2.28 U
PFNA	5.9/19	2.31 U	0.501 U	0.513 U	3- 1922	X	HFPO-DA	6.0/23	2.28 U
HFPO-DA	6.0/23	2.31 U	0.501 U	0.513 U		1 11	4.31		0
C. Markey				LOO I			λ	Location	e B

185

480

	Sample		NRSJC-S1-SS20-000		
1 10	Sample Do	ate/Time	5/24/2022 12:06		
	Sample De	epth (ft bgs)	0.0-0.5		
	Media/Un	its	Surface Soil (µg/k		
		2022 EPA RSL			
		(Soil [µg/kg])			
	PFOA	19	0.501 U		
	PFOS	13	0.501 U		
	PFBS	1,900	0.501 U		
	PFHxS	130	0.501 U		
	PFNA	19	0.501 U		

23

HFPO-DA

NOTES:

Bolded text indicates detection EPA = United States Environmental Protection Agency ft bgs = feet below ground surface ft btoc = feet below top of casing HFPO-DA = hexafluoropropylene oxide dimer acid J = Analyte present, value may or may not be accurate or precise NAVSTA = Naval Station ng/L = nanograms per liter NRC = Naval Recreation Complex NRS = Naval Radio Station PFAS = per- and polyfluoroalkyl Substances PFBS = perfluorobutanesulfonic acid PFHxS = perfluorohexane sulfonate PFNA = perfluorononanoic acid PFOA = perfluorooctanoic acid PFOS = perfluorooctane sulfonate RSL = regional screening level U = The material was analyzed for, but not detected µg/kg = micrograms per kilogram

IMAGERY SOURCE: ESRI ArcGIS Online Web Service, World Imagery, Maxar, 2021 Contours derived from USGS National Elevation Dataset

LEGEND

• Monitoring Well and Soil Sampling Location

ulletShallow Subsurface Soil Sample

- - Unpaved Ditch
- Groundwater Flow Direction
- Anticipated Overland Water Flow Direction
- 5' Topographic Contours
- Surface Waterbodies
- Road Centerline

Location NRSJC-S1-MW-07 NRSJC-S1-GW07-0722 NRSJC-S1-GW07P-0722 NRSJC-S1-SS07-000H NRSJC-S1 Sample Sample Date/Time 7/12/2022 11:35 7/12/2022 11:37 5/24/2022 11:31 6/17/20 Screen Interval* (ft btoc)/ Sample Depth** (ft bgs) 4.0-14* 4.0-14* 0.0-0.5** 3.0-Media/Units Groundwater (ng/L) Groundwater (ng/L) Surface Soil (µg/kg) Subsurface 2022 EPA RSL (Groundwater [ng/L]/ Soil [μg/kg]) 6.0/19 2.27 U 1.09 J PFOA 0.499 U 0.5 PFOS 4.0/13 2.27 U 0.5 2.31 U 0.499 U PFBS 600/1,900 2.27 U 2.31 U 0.499 U 0.5 PFHxS 0.5 39/130 2.27 U 2.31 U 0.499 U PFNA 5.9/19 2.27 U 2.31 U 0.499 U 0.5 HFPO-DA 6.0/23 2.27 U 2.31 U 0.499 U 0.5

BUILDING

Installation Boundary

Potential PFAS Release Area (assumed boundary)

0.501 U

`,			
0700	NRSJ	C-S1-MW-06	
0722	NRSJC-S1-SS06-000H	NRSJC-S1-SB06-0/08	NRSJC-S1-SB06-2526
15	5/24/2022 11:04	6/20/2022 16:50	6/21/2022 14:35
	0.0-0.5**	7.0-8.0**	25-26**
g/L)	Surface Soil (µg/kg)	Subsurface Soil (µg/kg)	Subsurface Soil (µg/kg)
			8
	0.5 U	0.506 U	0.501 U
	0.218 J	0.506 U	0.501 U
	0.5 U	0.506 U	0.501 U
	0.5 U	0.506 U	0.501 U
	0.5 U	0.506 U	0.501 U
	0.5 U	0.506 U	0.501 U
-			
1		· · · · · · · · · · · · · · · · · · ·	
	NKSJC-S1-SB-ZU		Martin
н	NRSJC-S1-SB20-0203	NRSJC-S1-SB20P-0203	
	2020	3/24/2022 13.52	525
n) Si	2.0-3.0 ubsurface Soil (ua/ka)	Subsurface Soil (ua/ka)	
<i> </i> 30		500501/0CE 5011 (µg/kg/	
	0.498 U	0.5 U	ALL THE CHARTER
	0.498 U	0.5 U	
	0.498 U	0.5 U	CONTRACTOR OF THE OWNER
	0.498 U	0.5 U	```
	0.498 U	0.5 U	
	0.498 U	0.5 U	
		A ANALY	Ì.
			the second
-	- 1 - 2	HE UNIT	
1500	J. J.	im Cross	WHEELER RIDGE
		Wia	ip Location
			``
	No.	Se mose	e Co
-SB07	7-0304	/	<u>E</u>
)22 12	2:30	Naval	e
4.0**		Radio Station lim	K LU
Soil (′μg/kg)	Creek	Bia
			Jim G
	1. Contraction of the second	Bur	
13 U	The second	MOUNTAI	N L.
13 U	Twin		AUL T
13 U	Lakes		M CREEK
13 U			PARKI
13 U		ES CR	Level I F
13 U	1997	Ser A	
	A MARCH CHI CHI CHI CHI CHI CHI CHI CHI CHI C		

Figure 4-3 PFAS Soil and Groundwater Results: NRS Jim Creek, Site 1 Site Inspection for PFAS NAVSTA Everett, NRS Jim Creek, NRC Pacific Beach, Washington



Carlos Star					And I have been a					1
Location		NRSJC-S6-MW-10					Location			
Sample		NRSJC-S6-GW10-0722	NRSJC-S6-SS10-000H	NRSJC-S6-SB10-1415	NRSJC-S6-SB10P-1415	Contraction of the	Sample		NRSJC-S6-GW08-072	2
🔍 Sample Da	te/Time	7/13/2022 12:00	5/24/2022 15:28	6/10/2022 13:50	6/10/2022 13:55	1. 19 19 19	Sample Da	te/Time	7/13/2022 13:05	
Screen Inte	rval* (ft btoc)/ Sample Depth** (ft bgs)	14-24*	0.0-0.5**	14-15**	14-15**	Martin a	Screen Inte	erval* (ft btoc)/ Sample Depth** (ft bgs)	4.0-14*	
Media/Un	its	Groundwater (ng/L)	Surface Soil (µg/kg)	Subsurface Soil (µg/kg)	Subsurface Soil (µg/kg)		Media/Un	its	Groundwater (ng/L)	
12	2022 EPA RSL							2022 EPA RSL		
``	(Groundwater [ng/L]/ Soil [µg/kg])						2	(Groundwater [ng/L]/ Soil [µg/kg])		
PFOA	6.0/19	2.43 U	0.501 U	0.501 U	0.5 U		PFOA	6.0/19	2.3 U	
PFOS	4.0/13	2.43 U	0.501 U	0.501 U	0.5 U		PFOS	4.0/13	2.3 U	
PFBS	600/1,900	2.43 U	0.501 U	0.501 U	0.5 U	Mar and	PFBS	600/1,900	2.3 U	
PFHxS	39/130	2.43 U	0.501 U	0.501 U	0.5 U		PFHxS	39/130	2.3 U	
PFNA	5.9/19	2.43 U	0.501 U	0.501 U	0.5 U		PFNA	5.9/19	2.3 U	
HFPO-DA	6.0/23	2.43 U	0.501 U	0.501 U	0.5 U	12200	HFPO-DA	6.0/23	2.3 U	
· · · · · · ·		i i i i i i i i i i i i i i i i i i i	CARL CARLING				an an all starts	/	and the second second	1

SITE 6 LANDFILL)

Installation Boundary

NOTES:

NOTES:
Bolded text indicates detection
EPA = United States Environmental Protection Agency
ft amsl = feet above mean sea level
ft bgs = feet below ground surface
ft btoc = feet below top of casing
HFPO-DA = hexafluoropropylene oxide dimer acid
J = Analyte present, value may or may not be accurate or precise
NAVSTA = Naval Station
ng/L = nanograms per liter
NRC = Naval Recreation Complex
NRS = Naval Radio Station
PFAS = per- and polyfluoroalkyl Substances
PFBS = perfluorobutanesulfonic acid
PFHxS = perfluorohexane sulfonate
PFNA = perfluorononanoic acid
PFOA = perfluorooctanoic acid
PFOS = perfluorooctane sulfonate
RSL = regional screening level
U = The material was analyzed for, but not detected
μg/kg = micrograms per kilogram

IMAGERY SOURCE: ESRI ArcGIS Online Web Service, World Imagery, Maxar, 2021 Contours derived from USGS National Elevation Dataset

LEGEND

- Monitoring Well and Soil Sample Location
- ----> Groundwater Flow Direction

- > Anticipated Overland Water Flow Direction

- Surface Waterbodies
- 5' Topographic Contours
- ----- Road Centerline
- Potential PFAS Release Area (assumed boundary)

1	Location			NRSJC-S6-MW-09						
1	Sample		NRSJC-S6-GW09-0722	NRSJC-S6-GW09P-0722	NRSJC-S6-SS09-000H	NRSJC-S6-SB09-3H05				
1	Sample Do	ite/Time	7/12/2022 12:50	7/12/2022 12:52	5/24/2022 14:48	6/15/2022 14:15				
ANA	Screen Int	erval* (ft btoc)/ Sample Depth** (ft bgs)	4.0-14*	4.0-14*	0.0-0.5**	3.5-5.0**				
	Media/Un	its	Groundwater (ng/L)	Groundwater (ng/L)	Surface Soil (μg/kg)	Subsurface Soil (µg/kg)				
		2022 EPA RSL				2				
		(Groundwater [ng/L]/ Soil [µg/kg])								
	PFOA	6.0/19	2.19 U	1.24 J	0.497 U	0.5 U				
1.1.	PFOS	4.0/13	2.19 U	2.16 U	0.284 J	0.5 U				
	PFBS	600/1,900	2.19 U	2.16 U	0.497 U	0.5 U				
	PFHxS	39/130	2.19 U	2.16 U	0.497 U	0.5 U				
	PFNA	5.9/19	2.19 U	2.16 U	0.497 U	0.5 U				
	HFPO-DA	6.0/23	2.19 U	2.16 U	0.497 U	0.5 U				
1 1 1	1 1				The second second					

535



NAVSTA Everett, NRS Jim Creek, NRC Pacific Beach, Washington



			1. 200		2 7 7 7 7 7 7 7 7				`、 ``	
- and a contract of the	8		Location						NRSJC-S7-MW-11	
	N		Sample		NRSJC-S7-GW11-1122	NRSJC-S7-GW11P-1122	2 NRSJC-S1-SS11-000H	NRSJC-S1-SS11P-000H	INRSJC-S1-SB11-42H43H	NRSJ
Jim c	WHEELER RIDGE		Sample Da	ite/Time	11/9/2022 15:15	11/9/2022 15:20	11/1/2022 11:30	11/1/2022 9:00	11/1/2022 9:05	11/
Greek	Man Location		Screen Inte	erval* (ft btoc)/ Sample Depth** (ft bgs)	234-254*	234-244*	0.0-0.5**	0.0-0.5**	42.5-43.5**	
			Media/Un	its	Groundwater (ng/L)	Groundwater (ng/L)	Surface Soil (µg/kg)	Surface Soil (µg/kg)	Subsurface Soil (µg/kg)	Subsur
				2022 EPA RSL						
	- eek			(Groundwater [ng/L]/ Soil [μg/kg])						
	m Cree		PFOA	6.0/19	2.31 U	2.69 U	0.501 U	0.499 U	0.5 U	
Naval	e o'		PFOS	4.0/13	2.31 U	2.69 U	0.501 U	0.499 U	0.5 U	
Radio			PFBS	600/1,900	2.31 U	2.69 U	0.501 U	0.499 U	0.5 U	
Station Ji	im SF	1 1 1 A NON	PFHxS	39/130	2.31 U	2.69 U	0.501 U	0.499 U	0.5 U	
Creek	1.ittle		PFNA	5.9/19	2.31 U	2.69 U	0.501 U	0.499 U	0.5 U	
			HFPO-DA	6.0/23	2.31 U	2.69 U	0.501 U	0.499 U	0.5 U	
	BLUE (06	1
Twin	OUNTAIN							0	70 2	
	2000 #				1 1 1 1 1 1		45	228	0	
Editor	NRS JIM CREEK					02	× · · · · · · · · · · · · · · · · · · ·			F
	Kent Kan	i i i i i i i i i i i i i i i i i i i		a la					A	
	The set of the			1 1 1 8 01 1	1 1 1 1 1 1	1111111	1181111			
1 Di Di Torres	8			C C C C C C C C C C C C C C C C C C C	1 1 1 1 1 1		1 1 1 8 1 1 1 1			
				S S S S S S S S S S S S S S S S S S S	11111	1111111	11111111		- Charles and and and	
				S. S. S.				5		/

Location				NRSJC-S7-MW-13 ^b			
Sample	NRSJC-S1-SS07-000H	NRSJC-S7-SB13-3839	NRSJC-S7-SB13-8485	NRSJC-S7-SB13-128129	NRSJC-S7-SB13-177178	NRSJC-S7-SB13-215216	NRSJC-S7-SB13P-215216
Sample Date/Time	5/24/2022 16:04	10/13/2022 17:00	10/14/2022 10:35	10/25/2022 16:15	10/25/2022 12:25	10/27/2022 8:30	10/27/2022 8:30
Sample Depth (ft bgs)	0.0-0.5	38-39	84-85	128-129	177-178	215-216	215-216
Media/Units	Surface Soil (µg/kg)	Subsurface Soil (µg/kg)	Subsurface Soil (µg/kg)	Subsurface Soil (µg/kg)	Subsurface Soil (µg/kg)	Subsurface Soil (µg/kg)	Subsurface Soil (µg/kg)
2022 EPA RSL							
(Soil [µg/kg])							

PFOA	19	0.502 U	0.499 U	0.499 U	0.5 U	0.499 U	0.499 U	0.5 U
PFOS	13	0.502 U	0.499 U	0.499 U	0.5 U	0.499 U	0.499 U	0.5 U
PFBS	1,900	0.502 U	0.499 U	0.499 U	0.5 U	0.499 U	0.499 U	0.5 U
PFHxS	130	0.502 U	0.499 U	0.499 U	0.5 U	0.499 U	0.499 U	0.5 U
PFNA	19	0.502 U	0.499 U	0.499 U	0.5 U	0.499 U	0.499 U	0.5 U
HFPO-DA	23	0.502 U	0.499 U	0.499 U	0.5 U	0.499 U	0.499 U	0.5 U

595

STE7	(PIT``~
ROADLA	NDFILL

NRSJC-S7-GW12A-1122NRSJC-S7-SS12-000H NRSJC-S7-SB12

10/7/2022 9:45

0.0-0.5**

0.5 U

0.5 U

0.5 U

0.5 U

0.5 U

0.5 U

Surface Soil (µa/ka) Subsurface Soil

11/10/2022 13:35

233-243*

Groundwater (na/I)

2.68 U

2.68 U

2.68 U

2.68 U

2.68 U

2.68 U

、 ·	NOTES:
`	^a Well was redrilled. All data is from redrilled well.
	^b Well was dry. No groundwater sample collected.
ì	EPA = United States Environmental Protection Agency
ς.	ft bgs = feet below ground surface
	HFPO-DA = hexafluoropropylene oxide dimer acid
• .	NAVSTA = Naval Station
	ng/L = nanograms per liter
• ~	NRC = Naval Recreation Complex
	NRS = Naval Radio Station
Ì	PFAS = per- and polyfluoroalkyl Substances
``	PFBS = perfluorobutanesulfonic acid
• •	PFHxS = perfluorohexane sulfonate
	PFNA = perfluorononanoic acid
	PFOA = perfluorooctanoic acid
``	PFOS = perfluorooctane sulfonate
• •	RSL = regional screening level
	U = The material was analyzed for, but not detected
	μg/kg = micrograms per kilogram
È.	
-	IMAGERY SOURCE:

ESRI ArcGIS Online Web Service, World Imagery, Maxar, 2021 Contours derived from USGS National Elevation Dataset

LEGEND

- Monitoring Well and Soil Sample Location
- > Anticipated Groundwater Flow Direction
- > Anticipated Overland Water Flow Direction
- Surface Waterbodies
- 5' Topographic Contours
- ----- Road Centerline
- e i Potential PFAS Release Area (assumed boundary)
- Potential PFAS Release Area (No Investigation Required based on Building 6 Data)

Installation Boundary

200

69

640

655

660

665

S.

Location

Sample

PFOA

PFOS

PFBS

PFHxS

PFNA

HFPO-DA

Media/Units

Sample Date/Time

Screen Interval* (ft btoc)/ Sample Depth ** (ft bgs)

2022 EPA RSL

Groundwater [ng/L]/ Soil [µg/kg])

6.0/19

4.0/13

600/1,900

39/130

5.9/19

6.0/23

680

MW-11	· · · ·						
42H43H	NRSJC-S1-SB11	-9394 NRSJC-S1-SB	11-146147 NRSJC	-S1-SB11-191192	NRSJC-S1-SB11	-231232	
9:05	11/1/2022 15	:15 11/2/2022	11:00 11/	2/2022 14:40	11/3/2022 1	1:00	
**	93-94**	146-14	7**	191-192** face Soil (231-232*	*	
(µу/кд)	oubsurjāce Sõll (µу/ку/рирsurface Sc	νιι (μg/ κg/pubsur	јисе зон (µg/кĝ)	pubsurjāce soli	(µy/ĸy)	
	0.5 U	0.5 (J	0.499 U	0.5 U	```	
	0.5 U	0.5 เ	J	0.499 U	0.5 U		
	0.5 U	0.5 l	J	0.499 U	0.5 U		
	0.5 U	0.5 เ	J	0.499 U	0.5 U		, OT
	0.5 U	0.51	J	0.499 U	0.5 U		8
1000	0.5 0	0.5		0.499 0	0.50		OF IL
	EIO I DISPO ARE	AT A	83		en 19	610 610 623	9.470 ²⁰ 585
				589		<u>B</u>	50)
- 063 (63	680 675						
		NRSJC-S7-MW-12 ^a					`.
IRSJC-S7	-SB12-9697 NR	SJC-S7-SB12-145146	NRSJC-S7-SB12-	174175 NRSJC-S	7-SB12-210211	NRSJC-S7-SB1	2-229230
10/5/20	02211:10	10/5/2022 16:00	10/6/202214	10/6/ * 21/6/	/2022 15:20	10/10/2022	12:55
96-	9/**	145-146**	1/4-1/5**	21 (ug/kg)Subsurf	10-211** xco Soil /···~ //1	229-230	/*** il (ua /ka)
usurface	2 3011 (μg/ κg) p ut	isurjace soll (μg/kg)	pubsurjāce Soll (µу/кдриbsurfa	ісе зон (µg/кg)	subsurface So	" (μg/ κg)
0.	.5 U	0.5 U	0.501 U		0.5 U	0.501	U
0.	.5 U	0.5 U	0.501 U		0.5 U	0.501	U
0.	.5 U	0.5 U	0.501 U		0.5 U	0.501	U `,
0.	.5 U	0.5 U	0.501 U		0.5 U	0.501	U
0.	.5 U	0.5 U	0.501 U		0.5 U	0.501	U
0.	.5 U	0.5 U	0.501 U	1	0.5 U	0.501	U

Figure 4-5

PFAS Soil and Groundwater Results: NRS Jim Creek, Site 7 Site Inspection for PFAS NAVSTA Everett, NRS Jim Creek, NRC Pacific Beach, Washington



<u>/ ``</u>													
Location		NRSJC-S4-MW-14				Location NRSJC-S5-MW-16						1055	A
Sample		NRSJC-S4-GW14-0722	NRSJC-S4-GW14P-07	22 NRSJC-S4-SB14-0203	NRSJC-S4-SB14-1718	Sample		NRSJC-S5-GW16-0722	NRSJC-S5-GW16P-0722	NRSJC-S5-SS16-000H	NRSJC-S5-SB16-1314	0000	
Sample Da	ite/Time	7/13/2022 14:20	7/13/2022 14:22	6/29/2022 11:15	6/29/2022 15:20	Sample Date,	/Time	7/12/2022 15:30	7/12/2022 15:32	5/25/2022 10:07	6/27/2022 12:15	1000	12 5
Screen Inte	erval* (ft btoc)/Sample Depth** (ft bgs)	17-27*	7.0-17*	2.0-3.0**	17-18**	Screen Interv	al* (ft btoc)/Sample Depth** (ft bgs)) 16.5-26.5*	16.5-26.5*	0.0-0.5**	13-14**	······	1
Media/Un	its	Groundwater (ng/L)	Groundwater (ng/l	Subsurface Soil (µg/kg)	Subsurface Soil (μg/kg)	Media/Units		Groundwater (ng/L)	Groundwater (ng/L)	Surface Soil (µg/kg)	Subsurface Soil (µg/kg)	0.	
	2022 EPA RSL				1		2022 EPA RSL						
8	(Groundwater [ng/L]/Soil [μg/kg])						(Groundwater [ng/L]/Soil [μg/kg])	_					
PFOA	6.0/19	2.4U	2.34 U	0.498 U	0.487 U	PFOA	6.0/19	2.44 U	2.36 U	0.501 U	0.502 U	Location	NRSJC-S5-SB-21
PFOS	4.0/13	2.4 U	2.34 U	0.498 U	0.487 U	PFOS	4.0/13	2.44 U	2.36 U	0.5010	0.502 0	Sample Date/Time	5/25/2022 10:48
PEBS	600/1,900	2.40	2.34 U	0.498 0	0.4870	PFBS	600/1,900	2.44 U	2.36 U	0.5010	0.502 0	Sample Denth (ft has)	2.0-3.0
PFHXS	39/130	2.40	2.34 U	0.498 0	0.487 0		39/130	2.44 U	2.36 U	0.5010	0.502 0	Media/Units	Subsurface Soil (µa/ka)
	5.9/19	2.40	2.34 U	0.498 U	0.487 0		5.9/19	2.44 U	2.30 U	0.5010	0.502 0	2022 EPA RSL	
HFPO-DA	6.0/23	2.40	2.34 0	0.498 0	0.4870	HFPO-DA	6.0/25	2.44 0	2.300	0.5010	0.302.0	(Soil [µg/kg])	N.
Lasatian		NIRGIC C										PFOA 19	0.502 U
Comple					E a B							PFOS 13	0.502 U
Sample Do	to/Time	7/12/2022 15-0722	6/20/2022 1 A-2E		ରୁ ଜିନ୍ମ କ							PFBS 1,900	0.502 U
Screen Inte	programs programs (ft htor)/Sample Denth ** (ft has)	17-77*	16-17**	/ 8	O N							PFHxS 130	0.502 U
Media/Lin	its	Groundwater (na/l)	Subsurface Soil (ua/		R	· · · · ·						PFNA 19	0.502 U
Nicula, Oli	2022 FPA RSI	Groundwater (ng/L)	505501500C 5011 (µg/	9/ 9	ad		SIJE 5					HFPO-DA 23	0.502 U
	(Groundwater [na/L]/Soil [ua/ka])					1	(MIXED WASTE	Loc	ation			NRSJC-S5-MW-19	
PFOA	6.0/19	2.25 U	0.494 U					Sar	mple		NRSJC-S5-GW19-0722	NRSJC-S5-SS19-000H	NRSJC-S5-SB19-1011
PFOS	4.0/13	2.25 U	0.494 U					Sal	mple Date/Time		7/12/2022 10:40	5/25/2022 11:15	6/23/2022 15:40
PFBS	600/1,900	2.25 U	0.494 U					Scr	een Interval* (ft btoc)/So	ample Depth** (ft bgs)	11-21*	0.0-0.5**	10-11**
PFHxS	39/130	2.25 U	0.494 U		A March March			Me	edia/Units		Groundwater (ng/L)	Surface Soil (μg/kg)	Subsurface Soil (µg/kg)
PFNA	5.9/19	2.25 U	0.494 U						202	22 EPA RSL			,
HFPO-DA	6.0/23	2.25 U	0.494 U			Calles and			(Groundwater	r [ng/L]/Soil [µg/kg])			
								PF	A	6.0/19	2.34 U	0.501 U	0.491 U
	585	E	600					PF(4.0/13	2.34 U	0.501 U	0.491 0
		1. 1.	Sec. Market					PFI	55 0	20/120	2.34 U	0.501 0	0.491 0
			Vi.			X				<u>39/130</u>	2.34 U	0.501 0	0.491 0
			"M.Cr							5.9/19 6.0/23	2.34 0	0.501 0	0.491 0
			eet o	1		1	200 A			0.0/23	2.540	0.3010	0.4510
୍ଷ୍ର		590	"JOBOL			. TH					SCH1/	N Contraction	· / · · · ·
NOTEO		'	A A A		· · · ·	16 T		C. C.			Jim Crost-	WHEEL	ER RIDGE
FPA = Un	ited States Environmental Protection Agen					1 20		63, 0			- Cock	Ma	n Location
ft bgs = fe	et below ground surface	,	595			@	, o					/	
ft btoc = fe	eet below top of casing		in the second	1			30					γ	- RK
NAVSTA =	- nexalition	Charles and the second s											Sim Cree
ng/L = nar	nograms per liter	C,	Location				NRSJC-S5-MW-18				N	aval	819
NRC = Na	val Recreation Complex		Sample		NRSJC-S5-GW18-0722	NRSJC-S5-SS	18-000H NRSJC-S5-SB18-0708	NRSJC-S5-SB18-1415	NRSJC-S5-SB18P-1415		R	adio	
PFAS = be	er- and polvfluoroalkyl Substances		Sample Date/Tim		7/13/2022 9:40	5/25/2022	11:43 6/22/2022 14:45	6/22/2022 14:50	6/22/2022 14:55		Stati	on Jim	17 77 3
PFBS = pe	erfluorobutanesulfonic acid		Screen Interval* (t btoc)/Sample Depth ** (ft b	ngs) 14-24*	0.0-0.5	** 7.0-8.0**	14-15**	14-15**		- FU	- Little-	
PFHxS = p	perfluorohexane sulfonate		Media/Units	2022 554 564	Groundwater (ng/L)	Surface Soil	(μg/kg) Subsurface Soil (μg/kg) S	Subsurface Soil (µg/kg)	Subsurface Soil (µg/kg)			[]	
PFOA = pe	erfluorooctanoic acid	63	``	2022 EPA KSL	7)							BLUE	n san:
PFOS = p	erfluorooctane sulfonate			6 0/10 μg/Kg	<u>]/</u>	0.400	0.51111	0.40011	0 400 11		A CAL	MOUNTAIN	2 maril
RSL = reg	Ional screening level		DEOS	1 0/12	2.30 U	0.499	0.5110	0.450 0	0.4330		Twin		2000 #
$\mu g/kg = mem$	icrograms per kilogram		PERS	4.0/13 600/1 900	2.30 0	0.499	0.5110	0.490 0	0.4390	N. C.	Lakes	INKS JIM CREEK	4 8 2 4
			PEHxS	39/130	2.380	0.499	U 0.511U	0.49811	0.49911		0	e	ALT
ESRI Arco	SOUKCE: SIS Online Web Service, World Imagery, M	axar, 2021	PENA	5.9/19	2.381	0.499	U 0.511 U	0.4981	0.4991			0	SI//
Contours	derived from USGS National Elevation Dat	aset 60-	HEPO-DA	6.0/23	2.381	0.499	U 0.511U	0.4981	0.49911		1 CP NO	NA OS	STACK.
	a character and the second of the second s	-30		0.0/20	2.500	0	0.5110	0.1500	5.1550				

	-	Location				NIDELE EF MAN 10				
nograms per liter	Contraction of the second	Location		NK2)C-22-IMM-18						
aval Recreation Complex	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	Sample		NRSJC-S5-GW18-0722	NRSJC-S5-SS18-000H	NRSJC-S5-SB18-0708	NRSJC-S5-SB18-1415	NRSJC		
aval Radio Station			ite/Time	7/13/2022 9:40	5/25/2022 11:43	6/22/2022 14:45	6/22/2022 14:50	6/22		
er- and polyfluoroalkyl Substances perfluorobutanesulfonic acid	and polyfluoroalkyl Substances			14-24*	0.0-0.5**	7.0-8.0**	14-15**			
perfluorohexane sulfonate		Media/Un	its	Groundwater (ng/L)	Surface Soil (µg/kg)	Subsurface Soil (µg/kg)	Subsurface Soil (µg/kg)	Subsurf		
erfluorononanoic acid perfluorooctanoic acid	626		2022 EPA RSL (Groundwater [ng/L]/Soil [µg/kg])							
gional screening level		PFOA	6.0/19	2.38 U	0.499 U	0.511 U	0.498 U			
naterial was analyzed for, but not detected		PFOS	4.0/13	2.38 U	0.499 U	0.511 U	0.498 U			
nicrograms per kilogram		PFBS	600/1,900	2.38 U	0.499 U	0.511 U	0.498 U			
Y SOURCE:		PFHxS	39/130	2.38 U	0.499 U	0.511 U	0.498 U			
GIS Online Web Service, World Imagery, Maxar, 2021		PFNA	5.9/19	2.38 U	0.499 U	0.511 U	0.498 U			

LEGEND

Monitoring Well and Soil Sampling Location

Shallow Subsurface Soil Sample Location

- ----> Groundwater Flow Direction
- > Anticipated Overland Water Flow Direction
- Surface Waterbodies
- 5' Topographic Contours
- ----- Road Centerline
- 62 Potential PFAS Release Area (assumed boundary)

Installation Boundary

Figure 4-6 PFAS Soil and Groundwater Results: NRS Jim Creek, Sites 4 and 5 Site Inspection for PFAS NAVSTA Everett, NRS Jim Creek, NRC Pacific Beach, Washington



	- Marine Contractor	-	and a second sec										
	Location												
	Sample		NRCPB-B106-GW01-0822 NRCPB-B106-GW01P-0822 N			NRCPB-B106-SS01-0001 NRCPB-B106-SS01P-0001 NRCPB-B106-SB01-							
	Sa	imple Do	nte/Time		8/9/2	2022 11:40	8/9/2022	11:45	8/3/2022 10:30	8/3/2022 10:35	8/3/2022 16:50		
	Sa	reen Inte	erval* (ft htoc)/San	nnle Denth** (ft has)	0, 3, 2	1-21*	11-2	1*	0.0-1.0**	0.0-1.0**	13-14**		
	M	edia /I In	its		Ground	water (na/l)	Groundwat	er (na /L)	Surface Soil (ua/ka)	Surface Soil (ua/ka)	Subsurface Soil (ua/ka)		
		culay off	2022	FPA RSI	Ground	water (ng/L)	Groundwar		5α17αες 50π (μg/ kg/	501/000 501 (µg/ kg/	500501juce 501 (µg/ kg/		
	Section and the		(Groundwater [i	na/I1/Soil[µa/ka])									
	PF	ŌA	<u>() () () () () () () () () () () () () (</u>	0/19	:	3.61 J	3.42	J	0.502 U	0.498 U	0.502 U		
	PF	OS	4.	0/13		2.9J	2.55	J	0.26 J	0.498 U	0.502 U		
	PF	BS	600	/1,900	2	2.71 U	2.55	U	0.502 U	0.498 U	0.502 U		
	PF	HxS	39	9/130		3.7 J	3.21	l	0.502 U	0.498 U	0.502 U		
	PF	NA	5.	9/19	2	2.71 U	2.55	U	0.502 U	0.498 U	0.502 U		
C. martin	HF	PO-DA	6.	0/23	2	2.71U	2.55	U	0.502 U	0.498 U	0.502 U		
Location					NRC	PB-B106-MW-0)3		A CONTRACT				
Sample				NRCPB-B106-GW03-0	0822 NRCF	PB-B106-SS03-0	001 NRCPB-B1	06-SB03-050	6				
Sample Da	te/Time			8/10/2022 10:35	8	3/8/2022 12:00	8/8/20	022 13:40	A STREET				
Screen Inte	erval* (ft btoc))/Sample	e Depth** (ft bgs)	6.0-16*		0.0-1.0**	5.0	-6.0**	ALLEN A				
Media/Uni	its		1 10 57	Groundwater (ng/	L) Sur	face Soil (µg/kg) Subsurfac	e Soil (µq/kq)	/			
		2022 EPA	A RSL				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		Undert.				
2	(Groundwa	ater [na/	/L]/Soil [μq/ka])						and the second				
PFOA		6.0/1	19	2.5 U		0.499 U	0.	498 U					
PFOS		4.0/1	13	14.1		0.621 J	0.	498 U	A REAL PROPERTY				
PFBS		600/1.	900	2.5 U		0.499 U	0.	498 U					
PFHxS		39/13	30	2.4 J		0.499 U	0.	498 U		the states			
PFNA		5.9/1	19	2.5 U		0.499 U	0.	498 U			The Call Street of		
HFPO-DA		6.0/2	23	2.5 U		0.499 U	0.	498 U		1			
80	100		E						1st-Str.N	ILDING 106 DRMER FIRE ATION)	6		
location	A CONTRACTOR OF STREET	111111			NIPC	PR-R106-M/M/	12	ALC: NOT A	1. Martine a	and the first of the first			
Sample				NRCPB-B106-GW02-0	1822 NRCE	PB-B106-SS07-0	001 NRCPR-R1	06-5802-0910	0		the second states and		
Sample Da	te/Time			8/9/2022 12·40	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	3/3/2022 11·00	8/4/7	022 9:40		The Manual State	a the		
Screen Inte	erval* (ft btoc))/Sample	e Depth ** (ft bas)	10-20*		0.0-1.0**	9.0	-10**	ALL SALE	A MARINE MARINE	2		
Media/Uni	its	,, - <i>-</i> ipit	((Cog5)	Groundwater (na/	L) Sur	face Soil (ua/ka) Subsurfac	e Soil (ua/ka	1	and the second			
		2022 EP#	A RSL		, cur	,	,	(3/9)			A Contraction		
	(Groundwa	ater [na/	′L]/Soil [µɑ/kɑ])						Stalley Same				
PFOA		6.0/1	19	2.08 J		0.502 U	0.4	498 U	St. Bernette	and the second			
PFOS		4.0/1	13	5.53 J		0.502 U	0.4	498 U	Contraction and				
PFBS		600/1.	900	2.46 U		0.502 U	0.4	498 U	An altra	Plan			
PFHxS		39/13	30	2.46 U		0.502 U	0.4	498 U	Start March				
PFNA		5.9/1	19	2.46 U		0.502 U	0.4	498 U	A CONTRACTOR				
HFPO-DA		6.0/2	23	2.46		0.502 U	0.4	498 U	125				
NOTES: Bolded text Shaded indi If bgs = feet If btoc = feet HFPO-DA = .1 = Analyte	t indicates dete cates exceedan below ground s t below top of ca hexafluoropropropresent value m	ection ace of scre surface asing yylene oxid	eening level de dimer acid	recise							Map Location		
NAVSTA = N	Naval Station	nay or ma				Part and		191 3			NRC		
ng/l = nano	arams ner liter			100		an gran an	The second s	and the second se		化465/464	NKC		

PFAS = per- and polyfluoroalkyl Substances PFBS = perfluorobutanesulfonic acid PFHxS = perfluorohexane sulfonate PFNA = perfluorononanoic acid PFOA = perfluorooctanoic acid PFOS = perfluorooctane sulfonate RSL = regional screening level U = The material was analyzed for, but not detected µg/kg = micrograms per kilogram

ng/L = nanograms per liter

NRC = Naval Recreation Complex NRS = Naval Radio Station

IMAGERY SOURCE: ESRI ArcGIS Online Web Service, World Imagery, Maxar, 2019 Contours derived from USGS National Elevation Dataset

LEGEND

- Monitoring Well and Soil Sample Location
- Groundwater Flow Direction
- > Anticipated Overland Water Flow Direction
- Surface Waterbodies
- Surface Waterbodies
- 20' Topographic Contours
- **Road Centerline**
 - Potential PFAS Release Area
- [___] Installation Boundary



Figure 4-7 PFAS Soil and Groundwater Results: NRC Pacific Beach, Building 106 Site Inspection for PFAS NAVSTA Everett, NRS Jim Creek, NRC Pacific Beach, Washington



PACIFIC

BEACH

Of the eight potential PFAS release areas identified for SI activities in the PA, two are recommended for further investigation in the form of an RI, and six are recommended for no further investigation at this time. In addition, the Bio Pit Disposal Area is also recommended for no further investigation as indicated in **Table 5-1**. The conclusions and recommendations from the SI are summarized in **Table 5-1**.

Potential PFAS Release Area	Rationale	Recommendation
NAVSTA Everett		
Building 2114 (Fire Station)	• PFAS are present in the soil and groundwater at Building 2114. PFOA, PFOS, and PFHxS are present in groundwater and PFOS is present in the surface soil in two monitoring wells at Building 2114 at concentrations above the SLs. HHRS identified PFOS and PFHxS as COPCs for groundwater, indicating potential unacceptable human health risks.	 Initiate RI.
NRS Jim Creek		
Building 6 (Former Fire Station)	• PFAS are present in the soil and groundwater at Building 6. PFOS and/or PFHxS are present in groundwater in four monitoring wells at Building 6 at concentrations above the SLs. HHRS identified PFOS as a COPC for groundwater, indicating potential unacceptable human health risks.	 Initiate RI. Initiate RI.
Site 1 (Building 11 Landfill)	 Concentrations of PFOA, PFOS, and PFBS were detected in surface soil and/or groundwater but did not exceed SLs. PFAS were not detected in the subsurface soil samples. 	 No further investigation at this time.
	 The HHRS did not identify COPCs, indicating there are no unacceptable human health risks associated with exposure to PFOA, PFOS, PFBS, PFHxS, PFNA, and HFPO-DA in soil or groundwater based on available results. 	
	• There is no documentation of a release from the PA.	
Site 6 (Blue Campground Landfill)	 Concentrations of PFOS in surface soil and PFOA in groundwater were detected but did not exceed SLs. PFAS were not detected in the subsurface soil samples. 	• No further investigation at this time.
	 The HHRS did not identify COPCs, indicating there are no unacceptable human health risks associated with exposure to PFOA, PFOS, PFBS, PFHxS, PFNA, and HFPO-DA in soil or groundwater based on available results. 	
	• There is no documentation of a release from the PA.	
Site 7 (Pit Road Landfill)	 PFAS were not detected in the surface or subsurface soil and groundwater samples. 	 No further investigation at this time.
	• There is no documentation of a release from the PA.	
Site 4 (Metal Burial Pit)	 PFAS were not detected in the subsurface soil and groundwater samples. Surface soil samples were not collected due to asphalt at surface. 	 No further investigation at this time.
	• There is no documentation of a release from the PA.	
Site 5 (Mixed Waste Landfill)	 PFAS were not detected in the surface or subsurface soil and groundwater samples. There is no documentation of a release from the PA. 	• No further investigation at this time.

Table 5-1. PFAS Site Inspection Summary and Recommendations

Table 5-1. PFAS Site Inspection Summary and Recommendations

Potential PFAS Release Area	Rationale	Recommendation
Bio Pit Disposal Area	 Concentrations of surface and subsurface soil for all PFAS parameters are either non-detect or below SLs from suspected soil source material near the stormwater catch basin at Building 6. 	 No further investigation at this time.
	 Nondetections of PFAS in soil and groundwater at Site 7 (Pit Road Landfill) indicates no transport of PFAS- containing surface water from the Bio Pit Disposal Area. 	
	 There is no evidence that PFAS-containing vegetative debris or sediment in the storm drain at Building 6 were transported to the Bio Pit Disposal Area. 	
	 There is no documentation of a release to this area from the PA. 	
NRC Pacific Beach		
Building 106 (Former Fire Station)	 PFAS are present in surface soil and groundwater at Building 106. PFOS in groundwater was detected above the SLs in two wells. 	• No further investigation at this time.
	 The HHRS did not identify COPCs, indicating there are no unacceptable human health risks associated with exposure to PFOA, PFOS, PFBS, PFHxS, PFNA, and HFPO-DA in soil or groundwater based on available results. 	
	• There is no documentation of a release from the PA.	

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