FINAL
Preliminary Assessment Report
Bremerton Readiness Center
Bremerton, Washington

Perfluorooctanesulfonic Acid (PFOS) and Perfluorooctanoic Acid (PFOA) Impacted Sites
ARNG Installations, Nationwide

September 2020

Prepared for:

Army National Guard Bureau
111 S. George Mason Drive
Arlington, VA 22204

UNCLASSIFIED

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Acronyms and Abbreviations

°F	degrees Fahrenheit
AECOM	AECOM Technical Services, Inc.
AFFF	aqueous film forming foam
amsl	above mean sea level
AOI	area of interest
ARNG	Army National Guard
BFTC	Bremerton (International Emergency Services) Fire Training Center
bgs	below ground surface
BOH	(Washington State) Board of Health
BRC	Bremerton Readiness Center
CENCOM/DEM	Central Communications/Department of Emergency Management
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CSM	conceptual site model
DOH	(Washington State) Department of Health
Ecology	Washington Department of Ecology
EDR™	Environmental Data Resources, Inc.
FTA	fire training area
HA	Health Advisory
JMG	Joint Management Group
NOAA	National Oceanic and Atmospheric Administration
PA	Preliminary Assessment
PFAS	per- and poly-fluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
SI	Site Inspection
US	United States
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USDOI	United States Department of the Interior
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WAARNG	Washington Army National Guard
WMD	Washington Military Department
WRIA	Water Resource Inventory Area
WRG	WRG Fire Training Systems, Inc
WYA	Washington Youth Academy

Executive Summary

The Army National Guard (ARNG) is performing Preliminary Assessments (PAs) and Site Inspections (SIs) for Perfluorooctanesulfonic acid (PFOS) and Perfluorooctanoic acid (PFOA) Impacted Sites at ARNG Facilities Nationwide. A PA for per- and polyfluoroalkyl substances (PFAS)-containing materials was completed for Washington Military Department's (WMD) Bremerton Readiness Center (BRC) in Bremerton, Washington to assess potential PFAS release areas and exposure pathways to receptors. The BRC is located on an 85-acre parcel and encompasses the Washington Youth Academy (WYA), the Bremerton International Emergency Services Fire Training Center (BFTC), and the Kitsap County Department of Emergency Services. The BRC is used as a joint fire training and emergency services facility.

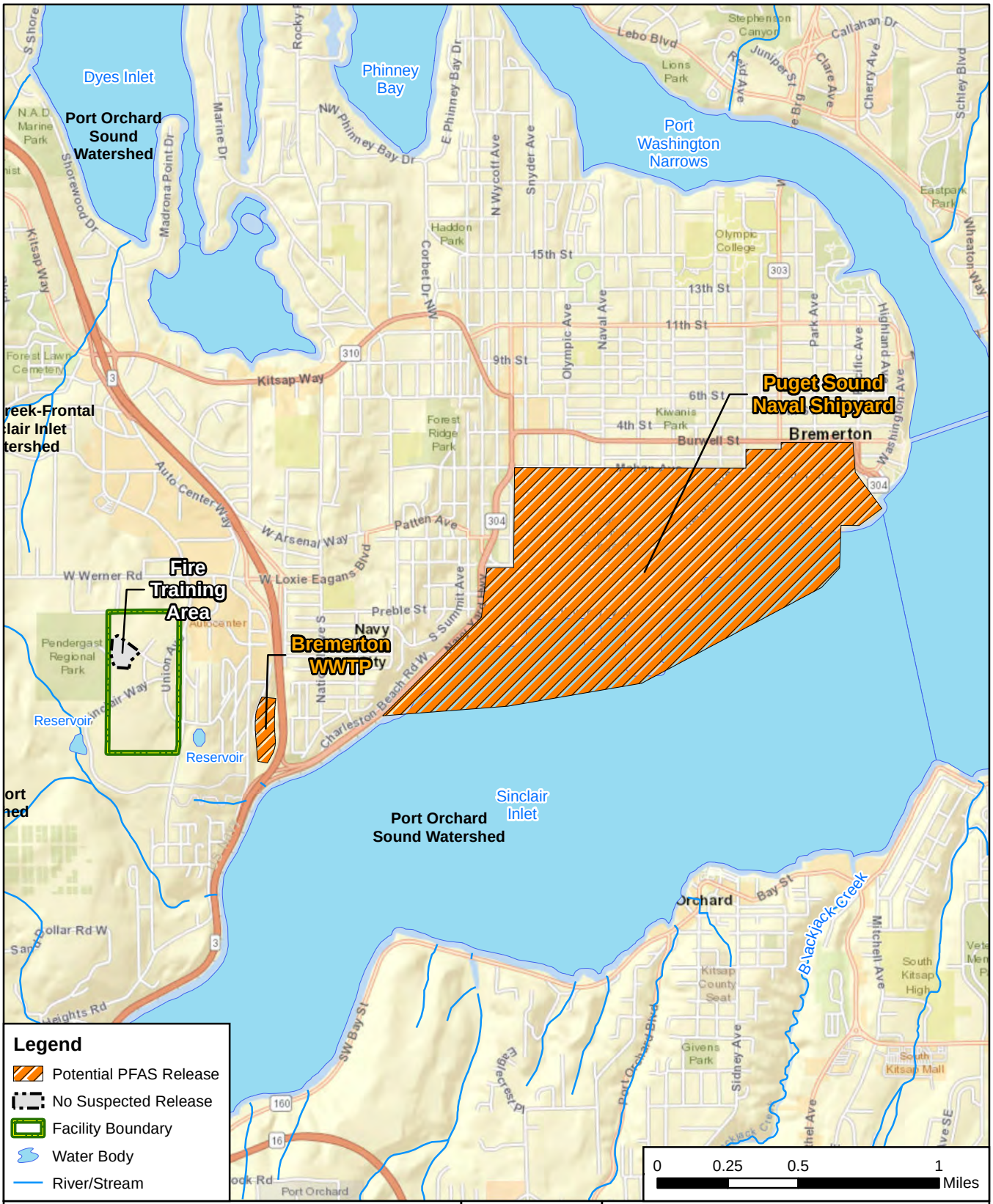
The performance of this PA included the following tasks:

- Reviewed available administrative record documents and Environmental Data Resources, Inc.™ report packages to obtain information relevant to potential PFAS releases, such as: drinking water well locations, historical aerial photographs, Sanborn maps, and environmental compliance actions in the area surrounding the facility;
- Conducted a 1-day site visit on 1 November 2019 and completed visual site inspections at locations where PFAS-containing materials were suspected of being stored, used, or disposed; and,
- Interviewed the following current BRC and BFTC personnel during the site visit: WMD Environmental Manager (in current position since October 2019); BRC Maintenance Supervisor (on-site since 2014); BRC Building Manager/WYA Administrator (on-site since 2017); Bremerton Fire Chief – Retired (on-site since 1999); WMD Contract Specialist (on-site since over 10 years); and, WRG Fire Training Systems, Inc. Director.

No Areas of Interest (AOIs) related to potential PFAS releases were identified at BRC during the PA. The summary of PA findings is shown on **Figure ES-1**.

Based on the US Environmental Protection Agency (USEPA) Unregulated Contaminant Monitoring Rule 3 data, no PFAS were detected in a public water system above the USEPA Health Advisory within 20 miles of the BRC, including the City of Bremerton's water supply, which was tested in 2013 and 2014 (USEPA, 2017). The HA is 70 parts per trillion for PFOS and PFOA, individually or combined. PFAS analyses performed in 2016 had method detection limits that were higher than currently achievable. Thus, it is possible that low concentrations of PFAS were not detected during the UCMR3 but might be detected if analyzed today.

Based on the documented absence of the use/release of PFAS-containing materials at BRC, evidence does not support current or former Washington ARNG activities having contributed to PFAS contamination in soil, groundwater, surface water, or sediment at the BRC (including the BFTC) or adjacent areas. Therefore, the BRC will not move forward in the Comprehensive Environmental Response, Compensation, and Liability Act process.



CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Bremerton Readiness Center, WA			
REVISED	9/16/2020	GIS BY	MS	9/16/2020
SCALE	1:31,680	CHK BY	MB	9/16/2020
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	RG	9/16/2020

Summary of Findings

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure ES-1

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1. Introduction

1.1 Authority and Purpose

The Army National Guard (ARNG) G9 is the lead agency in performing Preliminary Assessments (PAs) and Site Inspections (SIs) for Perfluorooctanesulfonic acid (PFOS) and Perfluorooctanoic acid (PFOA) at Impacted Sites at ARNG Facilities Nationwide. This work is supported by the United States (US) Army Corps of Engineers (USACE) Baltimore District and their contractor AECOM Technical Services, Inc. (AECOM) under Contract Number W912DR-12-D-0014, Task Order W912DR17F0192, issued 11 August 2017.

The ARNG is assessing potential effects on human health related to processes at their facilities that used per- and poly-fluoroalkyl substances (PFAS) (a suite of related chemicals), primarily releases of aqueous film forming foam (AFFF), although other sources of PFAS are possible. In addition, the ARNG is assessing businesses or operations adjacent to the ARNG facility (not under the control of ARNG) that could potentially be responsible for a PFAS release.

PFAS are classified as emerging environmental contaminants that are garnering increasing regulatory interest due to their potential risks to human health and the environment. PFAS formulations contain highly diverse mixtures of compounds. Thus, the fate of these PFAS compounds in the environment will vary. The regulatory framework at both federal and state levels continues to evolve. The US Environmental Protection Agency (USEPA) issued lifetime drinking water Health Advisories (HAs) for PFOA and PFOS in May 2016, but there are currently no promulgated national standards regulating PFAS in drinking water (USEPA, 2016). The HA is 70 parts per trillion for PFOS and PFOA, individually or combined.

This report presents findings of a PA for PFAS-containing materials at Bremerton Readiness Center (BRC; also referred to as the “facility”) in Bremerton, Washington, in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, the National Oil and Hazardous Substances Pollution Contingency Plan (40 Code of Federal Regulations Part 300), and Army requirements and guidance.

This PA documents potential locations of where PFAS may have been stored or released into the environment at BRC. The term PFAS will be used throughout this report to encompass all PFAS chemicals being evaluated, including PFOS and PFOA, which are key components of AFFF.

1.2 Preliminary Assessment Methods

The performance of this PA included the following tasks:

- Reviewed available administrative record documents and Environmental Data Resources, Inc. (EDR™) report packages to obtain information relevant to potential PFAS releases, such as: drinking water well locations, historical aerial photographs, Sanborn maps, and environmental compliance actions in the area surrounding the facility;
- Conducted a 1-day site visit on 1 November 2019 and completed visual site inspections at locations where PFAS-containing materials were suspected of being stored, used, or disposed; and,
- Interviewed the following current BRC and BFTC personnel during the site visit: WMD Environmental Manager (in current position since October 2019); BRC Maintenance Supervisor (on-site since 2014); BRC Building Manager/WYA Administrator (on-site since 2017); Bremerton Fire Chief – Retired (on-site since 1999); WMD Contract Specialist (on-site since over 10 years); and, WRG Fire Training Systems, Inc. Director.

1.3 Report Organization

This report has been prepared in accordance with the USEPA *Guidance for Performing Preliminary Assessments under CERCLA* (USEPA, 1991). The report sections and descriptions of each are as follows:

- **Section 1** – **Introduction:** identifies the project purpose and authority and describes the facility location, environmental setting, and methods used to complete the PA.
- **Section 2** – **Fire Training Areas:** describes the fire training areas (FTAs) at the facility identified during the site visit.
- **Section 3** – **Non-Fire Training Areas:** describes other locations of potential PFAS release(s) at the facility identified during the site visit.
- **Section 4** – **Emergency Response Areas:** describes areas of potential PFAS release(s) at the facility, specifically in response to emergency situations.
- **Section 5** – **Adjacent Off-Site Sources:** describes sources of potential PFAS release(s) adjacent to the facility that are not under the control of ARNG.
- **Section 6** – **Conceptual Site Model:** describes the pathways of potential PFAS transport and receptors at each Area of Interest (AOI).
- **Section 7** – **Conclusions:** summarizes the data findings and presents the conclusions of the PA.
- **Section 8** – **References:** provides the references used to develop this document.
- **Appendix A** – Data Resources
- **Appendix B** – Preliminary Assessment Documentation
- **Appendix C** – Photographic Log

1.4 Facility Location and Description

The BRC is in the City of Bremerton, Kitsap County, on the Kitsap Peninsula of the Puget Sound, approximately 20 miles west of the City of Seattle. The BRC is situated on top of a hillside west of Highway 3, approximately 2.5 miles southwest of downtown. The parcel on which the BRC is situated is an 85-acre, north-south oriented, rectangular property (Parcel No. 212401-4-004-2000) owned by State Agency Lands, and it is classified as *Government Services* (Kitsap, 2019; City of Bremerton, 2019b). The parcel is occupied by multiple agencies, including the following: the Washington ARNG (WAARNG), which is operating the BRC and the WYA, the Joint Management Group (JMG), which is managing/operating the BFTC, and Kitsap County, which is operating the Department of Emergency Management. Collectively, the BRC, WYA, and the BFTC encompass approximately 40 acres of land within the 85-acre parcel.

The developed use of the property dates back to the 1940s, when it was owned by the US Federal Government, who used it as housing during the WWII and Korean conflicts for US Navy family and personnel stationed at nearby Puget Sound Naval Shipyard and Bangor Base. In the late 1950s, the property was transferred from the US Navy to the US Housing Authority for use as low-income housing. Between the 1960s and 1990s, the US Housing Authority demolished the houses. Around 1994, the State of Washington, Kitsap County, and the WMD proposed acquisition of the property to the US Congress with a plan to build a new State Readiness Center, vacate the old armory previously on-site, and begin a State Youth Challenge Program, in addition to co-locating the Kitsap County Emergency Management Department and the Olympic Community College.

The BFTC has operated at the BRC since 1992, under the jurisdiction of the WMD, and is funded/managed by the JMG, which was formed in 1994 (Stiles, 2000; Smith, 2017; BFTC, 2019). The BFTC is developed with training structures equipped with fire props that include a fire tower, a mock helicopter on a concrete pad, and a naval vessel hull. Propane fuels the fire props at each of these training structures. The JMG sub-leases the BFTC to WRG to conduct contracted fire training exercises with the US Navy. WRG provides fire professionals with realistic fire training props and fire training facilities under structured training (WRG, 2019). Only the mock helicopter is owned/provided by WRG; the JMG owns the fire tower and all other fire props at the BFTC.

The BFTC is jointly coordinated among local fire departments (Bremerton Fire Department, South Kitsap Fire and Rescue, and Central Kitsap Fire and Rescue), the US Navy, and the US Coast Guard, in addition to other agencies conducting specialized firefighting training (e.g., Washington State Ferries, WAARNG, US Army, Merchant Marines, and the State of Washington) (Smith, 2017). The JMG's *Interlocal Cooperation Agreement* establishes an agreement among these local fire departments, in addition to the Kitsap County Sheriff's Office, Kitsap County Central Communications/Department of Emergency Management (CENCOM/DEM), and Kitsap County Coroners, in cooperation with the WMD (JMG, 2012). The JMG leases the BRC facilities from the WMD. The fire training structures are provided and maintained by WRG Fire Training Simulating Systems, Inc. (WRG, 2019).

The BRC has operated at its current Bremerton location since 2004, under the jurisdiction of the WMD (SSW Architects [SSW], 2019). The BRC is a regional training center with classrooms, a gymnasium, and dining facility. Its purpose is to be used for preparation of local officials to handle terrorist attacks and emergency situations, and also be an alternate location for the State Emergency Management Center (headquartered in Camp Murray). The BRC is used by the WMD, the US Navy, Olympic College programs, and most county fire districts. The purpose of the BRC is to provide facilities and resources as a training center contributing readiness and military capability for the armed forces of the US and Washington State.

The WYA has operated at its current Bremerton location since 2008, under the jurisdiction of the State of Washington (WMD, 2018a, 2019a). The WYA operates as the National Guard Youth ChalleNGe Program, providing military training and mentoring for at-risk youth (WMD, 2018a, 2019a).

Approximately 40 acres of the BRC parcel are developed primarily in the northern portion; the southern portion of the BRC parcel consists of undeveloped woodland. Approximately 15 percent (13 acres) of the BRC parcel is comprised of impervious pavement. Approximately 5 acres of the BFTC area is comprised of both pervious and impervious land. The WMD uses the woodland area (in the southern portion of the BRC parcel) on weekends for military training exercises.

Based on review of available historical aerial photographs, development of the facility appears to date back to at least 1951, with multiple roads transecting circularly near the parcel boundary, and three small facility structures visible in the central portion (Environmental Data Resources, Inc. [EDR^{TM}], 2019a). Additional structural development in the central portion of the property is evident by at least 1968 and again by at least 1981. The BRC structure appears developed by at least 2006. The BFTC appears developed by at least 1994, with the fire training tower developed by at least 2006, and the concrete pad with the mock helicopter FTA developed by at least 2017. The Kitsap County structures in the northern portion of the property appear developed by at least 2006, with additional development by at least 2009. By the 2017 aerial photograph, the BRC appears to be in the similar configuration as observed during the site visit (Google, 2018).

1.5 Facility Environmental Setting

The BRC is on the Kitsap peninsula of the Puget Sound marine embayments, located less than 15 miles west of Seattle (Sceva, 1957). The BRC is situated on a hillslope, along the eastern edge

of the central portion of the peninsula, at the west end of the Sinclair Inlet. The facility is shown on **Figure 1-1**.

The BRC is moderately flat with varying degrees of hillslope throughout, at an average elevation of approximately ±300 feet above mean sea level (amsl) (Google, 2018). The topography generally slopes south from the southern-most portion of the developed area and north from the northern-most portion of the developed area. The center of the property's developed area is situated at an elevation of approximately 340 feet amsl; the lowest topographical area of the property, along the southeastern boundary, is at an approximate elevation of 250 feet amsl (Google, 2018).

The BRC is located in the center of Bremerton's city limits, approximately 2.5 miles to the west of downtown Bremerton, in a mixed-use area of residential and commercial properties; a substantial area of undeveloped woodland is located to the south and west of the BRC; the Puget Sound Naval Shipyard is located approximately 1 mile to the east.

1.5.1 Geology

The BRC is located in a geologic area characterized as younger glacial drift of the Pleistocene geologic age of the Cenozoic era (i.e., Ice Age) (US Geological Survey [USGS], 2019a) (**Figure 1-2**). Major lithologic constituents are unconsolidated glacial till comprised of gravel and sand (USGS, 2019a). This geologic feature is found throughout the Puget Sound region, in the northwestern area of the state (USGS, 2019a). During the last glacial epoch, glacial ice sheets from the *Vashon drift* advanced south from British Columbia, Canada and filled part of the Puget Sound basin, depositing a mixture of clay, silt, sand, gravel, and boulders during its advancement across the land, known as glacial till. Volcanic and granitic rocks are the predominate rock type throughout Kitsap County (Sceva, 1957). Glacial till outwash that deposited throughout the county varies, with thicknesses of up to 80 feet (Sceva, 1957).

The BRC is situated in a volcanic area of the Pacific Northwest, between the Olympic Mountain Range to the west and the Cascade Mountain Range to the east (Sceva, 1957). The BRC overlies the Puget Trough section of the Puget Sound Pacific Border physiographic province (US Department of the Interior [USDOI], 2019; Sceva, 1957). This physiographic province extends north into Canada and south into western Oregon (Sceva, 1957). The Puget Sound trough is a lowland structural basin in consolidated rocks of Tertiary age and earlier (Sceva, 1957). The oldest rock outcrops in Kitsap County are thick sequences of basaltic flows of the Eocene age; flows located on the Sinclair Inlet have thicknesses of approximately 30 feet, with other areas extending several hundred to thousands of feet thick (Sceva, 1957).

1.5.2 Hydrogeology

Soils beneath the BRC consist of the Alderwood gravelly sandy loam soil series (US Department of Agriculture [USDA], 2019). This soil series formed in glacial till and is characterized as being moderately deep and moderately well drained (i.e., not prone to ponding or flooding) (USDA, 1980). The Alderwood soils are generally oriented north-south on broad hills (USDA, 1980). The Alderwood soil has a perched water table at a depth of 2.5 to 3 feet below ground surface (bgs) for short periods during the rainy season (winter and spring), where water flows laterally and seeps at slope bottoms (USDA, 1980).

The BRC overlies the Puget Sound lowland region of the Puget-Willamette Trough regional aquifer system, which extends a total of approximately 400 miles from the Canadian border to the north to central Oregon to the south (USGS, 1994). The major aquifer of this system in the Kitsap County area is the unconsolidated-deposit aquifer that consists of glacial deposits up to 3,000 feet thick; sand and gravel form the upper 200 to 300 foot layers of the aquifer, yielding the most productive aquifers (USGS, 1994). In Kitsap County, well depths typically extend from 130 feet

bgs up to 1,100 feet bgs, yielding less than 5 and up to 1,000 gallons of water per minute (USGS, 1994).

Due to a cool, wet climate during the winter months and fairly warm, dry climate during the summer months, groundwater supply is limited in the Kitsap County area during the summer (Ecology, 2019c). The lowest water levels have been documented in the late fall and early winter months, in contrast to the highest water levels documented in the late winter, spring, and early summer months, all of which is dependent on the overlying geologic materials and volume of snowmelt runoff (Sceva, 1957). Groundwater recharge in the region is generally dependent on precipitation, not influenced by snow melt; the water table typically fluctuates during recharge and discharge (Sceva, 1957). Due to its impermeability, glacial till of the *Vashon drift* yields small quantities of perched groundwater and is not a general source of water in the county (Sceva, 1957).

The BRC obtains drinking water from the City of Bremerton's public water supply, which is sourced from the Union River Reservoir and 13 groundwater wells located off-Post within the Bremerton-owned 3,000-acre watershed (City of Bremerton, 2019a). The City of Bremerton's public water supply is a Group A water system (ID 08200), effective as of January 1970, with 25,166 currently active connections serving a residential population of 56,565 and a non-residential population of 6,596 (DOH, 2019b). The Union River reservoir is located approximately 4 miles west of the BRC.

No active groundwater wells—drinking water supply or monitoring—are located within the BRC boundary (Ecology, 2019a; USGS, 2019b). The nearest groundwater wells are located less than 0.5 miles to the north of the BRC, at 5011 Auto Center Blvd (Well Report IDs 416786, 416787, 416877) (Ecology, 2019a). The geographic coordinates are 47°33'41.7"N; 122°40'59.1"W (Google, 2018). These groundwater wells are identified by Ecology as Resource Protection wells and were installed in 2005 at depths ranging from 15 feet 6 inches to 17 feet bgs; groundwater was not encountered during drilling as reported on the boring logs, but moist soil was encountered near the bottom of the wells (Ecology, 2019a). The nearest groundwater well with recorded water level measurements is an inactive well (USGS 473323122403201 24N/01E-21H01) located less than 0.25 miles east of the BRC (USGS, 2019c). The geographic coordinates are 47°33'22.7"N; 122°40'32.0"W (USGS, 2019c). This currently inactive well was installed in January 1992 to a depth of 173 feet bgs, with a recorded water depth of 148 feet bgs (USGS, 2019c). Groundwater wells are shown on **Figure 1-2,** with the exception of wells included in the State's database (Ecology, 2019b). For completeness, wells reported by the State are included on **Figure A-1** (**Appendix A**).

Generally, groundwater flow is expected to follow the topographical gradient, which is to the southeast towards the Sinclair Inlet (Earth Point, 2019). Depth to groundwater beneath the BRC is expected to be generally within 100 feet bgs (Sceva, 1957). However, groundwater depth may vary and can only be determined through on-site measurements.

Based on USEPA's Unregulated Contaminant Monitoring Rule 3 data, no PFAS were detected in a public water system above the USEPA HA within 20 miles of the BRC, including the City of Bremerton's water supply, which was tested in 2013 and 2014 (USEPA, 2017). The HA is 70 parts per trillion for PFOS and PFOA, individually or combined. PFAS analyses performed before 2016 had method detection limits that were higher than currently achievable. Thus, it is possible that low concentrations of PFAS were not detected during the UCMR3 but might be detected if analyzed today.

1.5.3 Hydrology

The BRC lies within two subwatersheds of the Kitsap watershed of the Puget Sound (Ecology, 2019b): the southern parcel lies within the Blackjack Creek-Frontal Port Orchard subwatershed, and the northern parcel lies within the Chico Creek-Frontal Sinclair Inlet subwatershed (USEPA,

2020a). No major rivers flow through the Kitsap watershed, only streams and creeks (Ecology, 2019b). Two water reservoirs are situated to the east and west of the southern quadrants of the BRC. Watersheds are shown on **Figure 1-3**.

No surface waterbodies (lakes, ponds, or wetlands) are located within, and no surface water features (rivers, streams, or creeks) flow through, the BRC boundary (USEPA, 2020a; US Fish and Wildlife Service [USFWS], 2019). Three dry stormwater retention ponds are located on the BRC: one along the northern boundary, one along the northwestern boundary, and one along the eastern boundary (WMD, 2018b, 2019b). Surface stormwater runoff from paved areas of the BRC enters a storm drainage conveyance system located throughout a majority of the facility and is then transported to the dry stormwater retention ponds and other off-site connections (WMD, 2018b, 2019b). Stormwater throughout unpaved areas of the property infiltrates the soil. Because precipitation infiltrates Alderwood gravelly sandy loam soil fairly rapidly, surface water runoff throughout the facility is negligible (USDA, 1980). Surface water runoff at the BRC would generally occur during heavy precipitation events, where precipitation exceeds the infiltration rate.

The nearest surface water feature is an unnamed stream and reservoir located less than 550 feet east of the BRC that flows in a southeasterly direction, towards the Sinclair Inlet (less than 0.5 miles downgradient) (Earth Point, 2019; USEPA, 2020a).

1.5.4 Climate

Climate in the region of the BRC is marine (Vaccaro et al, 1997). Due to its proximity to the Pacific Ocean and the Olympic Mountains of the Pacific Coast Range, the Puget Sound region experiences distinct wet and dry seasons characterized by moderate to heavy precipitation and mild to moderate temperatures (Sceva, 1957; Vaccaro et al, 1997). Approximately 80 percent of the precipitation in the Puget Sound region falls from October through March (in the form of snow at elevations above 1,500 feet amsl) (Vaccaro et al, 1997). Kitsap County, specifically, typically receives 30 to 70 inches of rain during the winter months (Ecology, 2019b).

Temperatures recorded for 2019 at the nearest climatological station in Bremerton ranged from an average low of 36 degrees Fahrenheit (°F) in February to an average high of 68°F in August, averaging 53°F for the year. Precipitation recorded for 2019 ranged from an average low of 0.03 inches in June to an average high of 9.91 inches in December, averaging 3.19 inches for the year (National Oceanic and Atmospheric Administration [NOAA], 2019).

1.5.5 Current and Future Land Use

Current Land Use of the Facility and Surrounding Area

The BRC is located on a single parcel of land developed with several structures and is used by multiple agencies for a variety of purposes. The BRC is comprised of two buildings occupied by the WMD operated as the BRC training facility and the WYA (Valencia, 2018). The BRC facility is fenced-in and gated, but it is not entirely gated along its entire property boundary.

The BRC property class is categorized as "Governmental Services" (Kitsap, 2019). The BRC is zoned *Freeway Corridor* (i.e., commercial) and surrounded mostly by residentially-zoned properties to the north, east, and southeast, including the Pendergast Regional Park to the west; undeveloped forest land is located adjacent to the south of the BRC and west of the Pendergast Regional Park; *Freeway Corridor*-zoned properties are located adjacent to the southwest and northeast of the BRC (Kitsap, 2019; City of Bremerton, 2019b). Two industrially-zoned parcels are located adjacent to the north of the BRC; however, review of aerial imagery depicts these parcels as undeveloped forest land (Kitsap, 2019). The industrially-zoned Bremerton Wastewater Treatment Plant is located approximately 0.25 miles to the east and hydrologically downgradient of the BRC (City of Bremerton, 2019). The military-zoned Puget Sound Naval Shipyard is located approximately 1 mile to the east, at a substantially lower elevation compared to the BRC (Kitsap, 2019).

The nearest urban area is the City of Bremerton, located approximately 2.5 miles to the northeast of the BRC. The estimated population of Bremerton in 2018 was 40,220 (Census, 2019).

Future Land Use of the Facility and Surrounding Area

According to interviews conducted with WRG facility personnel, WRG's fire training will be relocated from the BRC to the Wright Creek Business Park beginning July 1, 2020. The Wright Creek Business Park consists of several tracts of undeveloped land (addressed at 5210-5255 Sinclair Way) zoned *Freeway Corridor*, which is located adjacent to the east of the BRC parcel and south of the Pendergast Regional Park, less than 0.5 miles to the southeast of the BFTC (Windermere, 2020).

The City of Bremerton's future growth plan for the *Freeway Corridor*-zoned properties—including the parcel on which the BRC is situated—will involve the continued use of the land as zoned with the likelihood of increased property development that includes commercial, light industrial, and offices (City of Bremerton, 2016a; Kitsap, 2019). Most recent amendments to the City of Bremerton's 2016 *Comprehensive Plan* do not indicate any changes that would be likely to have an impact on the BRC facility parcel of land (City of Bremerton, 2017, 2018).

The BRC is within a geographic region categorized as 'Metropolitan Cities'—one of five geographic central Puget Sound regions—and is identified as "the most intensely urban places in the region" (PSRC, 2009). In Kitsap County's Metropolitan Cites (comprised of five major cities that includes Bremerton), a 26 percent population growth increase by 2040 is projected, while a nine percent population growth increase by 2040 is projected for Kitsap County as a whole (PSRC, 2009). For the City of Bremerton, the population is expected to grow to 53,407 by 2036, which is an increase of approximately 33% from the 2018 population estimate (City of Bremerton, 2016b).

CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Bremerton Readiness Center, WA			
REVISED	2/12/2020	GIS BY	MS	2/12/2020
SCALE	1:126,720	CHK BY	MB	2/12/2020
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	RG	2/12/2020

Facility Location

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 1-1

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CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Bremerton Readiness Center, WA			
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Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	RG	9/16/2020

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Groundwater Features

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 1-2

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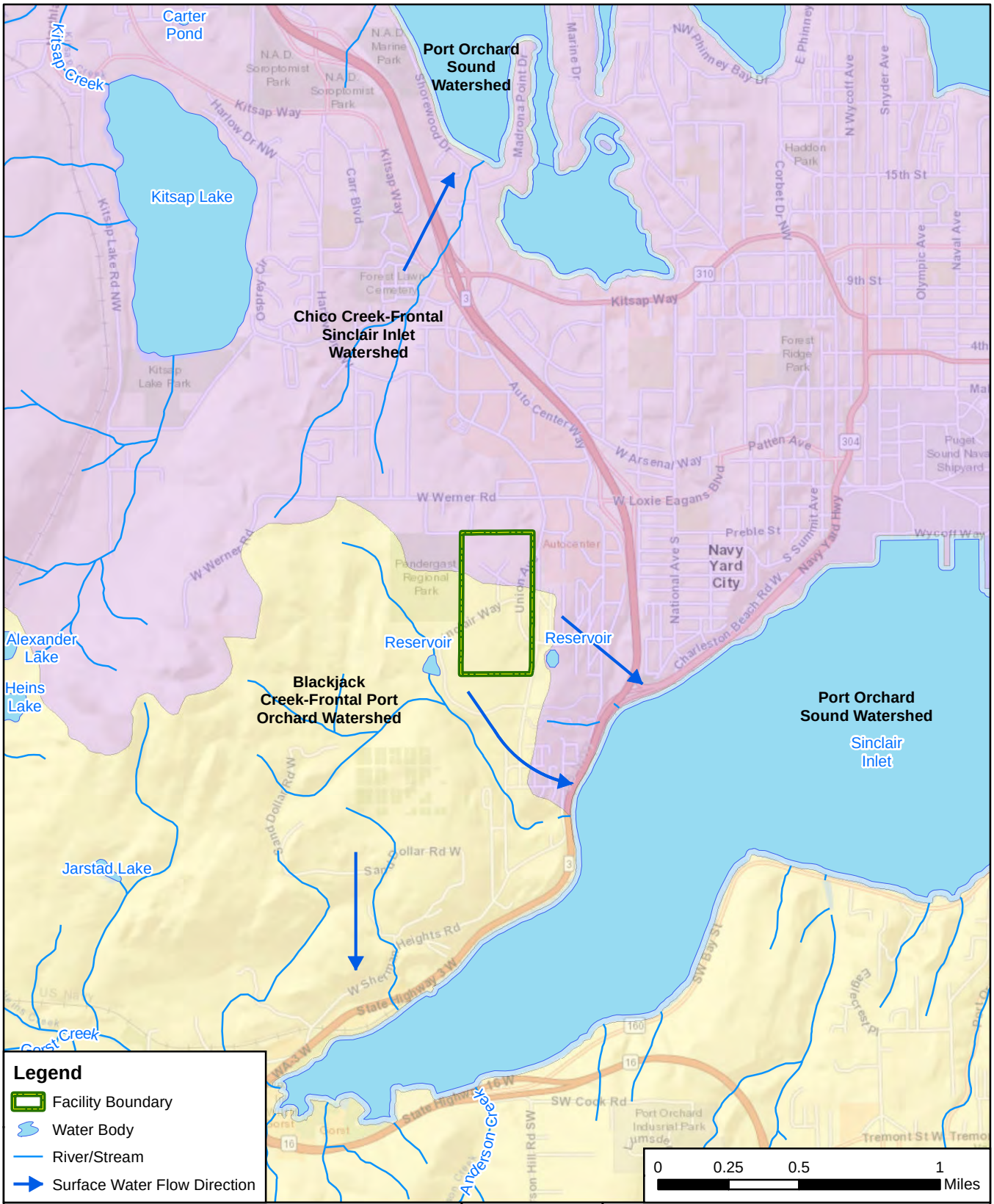

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Surface Water Features

AECOM
12420 Milestone Center Drive
Germantown, MD 20876

Figure 1-3

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2. Fire Training Areas

Based on interviews with BFTC personnel who have worked on-site dating back to 1999, no FTAs where PFAS were potentially released were identified at the BRC during the PA. While the BFTC is a dedicated FTA at the BRC, aviation firefighting training is not conducted. To the best of their knowledge, BFTC personnel reported that foam for fire suppression has never been stored or used at the BFTC. Based on interviews with BFTC personnel, a contract exists for users of the BFTC agreeing to not use AFFF (i.e., use water only) during training exercises. A copy of this contract was not provided during the PA. No firetrucks are brought on-site during training exercises. Water is the only media used for fire suppression during all fire training exercises on-site. Water used during training exercises to simulate flooding inside the fire tower is conveyed to and stored in a 25,000-gallon underground storage tank located adjacent to the fire tower. Water is supplied from an on-site fire hydrant and is sourced from the City of Bremerton. Interview records are provided in **Appendix B**, photographs are provided in **Appendix C**, and the FTA is shown on **Figure 2-1**.

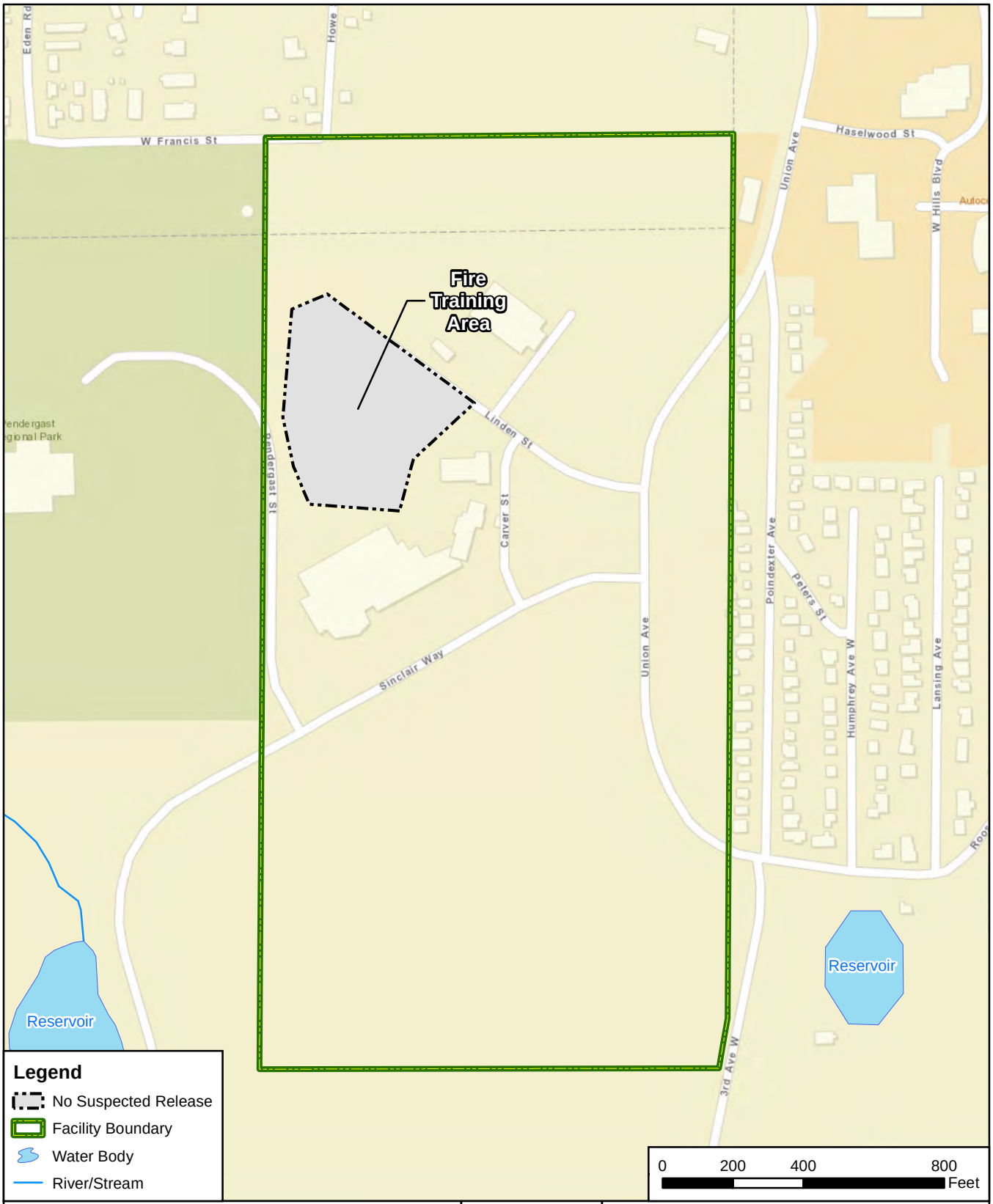
Firefighting support for structural fires at the BRC and the WYA is coordinated with the City of Bremerton Fire Department.

2.1 Off-Post Fire Training Areas

Based on interviews with facility personnel, there are no off-post FTAs associated with the BRC or the BFTC.

2.2 Prescribed Burns

Based on interviews with facility personnel and the WMD's Environmental Manager, there are no prescribed burns conducted at or in the vicinity of the BRC. The State's *Integrated Natural Resources Management Plan* does not identify established plans for prescribed burns at or in the vicinity of the BRC (Valencia, 2018).



CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Bremerton Readiness Center, WA			
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SCALE	1:4,800	CHK BY	MB	9/16/2020
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	RG	9/16/2020

N

Fire Training Area

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Figure 2-1

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3. Non-Fire Training Areas

In addition to FTAs, the PA evaluated areas where PFAS-containing materials may have been broadly used, stored, or disposed. This may include buildings with fire suppression systems, paint booths, AFFF storage areas, and areas of compliance demonstrations. No non-FTAs were identified at the BRC — including the BFTC — during the PA. The BRC is equipped with ABC fire extinguishers and a water-only fire suppression system throughout the building.

4. Emergency Response Areas

Based on interviews conducted with facility personnel, no emergency response actions using AFFF have occurred at the BRC. Frequent fire training events are conducted at the on-site FTA (the BFTC) throughout the year, where only water is used for fire suppression.

5. Adjacent Sources

No potential off-Post releases of PFAS were identified during the PA. Based on interviews conducted with facility personnel and review of publicly available state and federal regulatory databases and other sources, no historically or currently active landfills, wastewater treatment plants, electrical maintenance, chrome plating shops, or Superfund Sites were identified in the vicinity of the BRC, with exception of the Bremerton Wastewater Treatment Plant and the Puget Sound Naval Shipyard shown on **Figure 5-1** and summarized below (USEPA, 2019b; Ecology, 2002, 2019c; EDR™, 2019b).

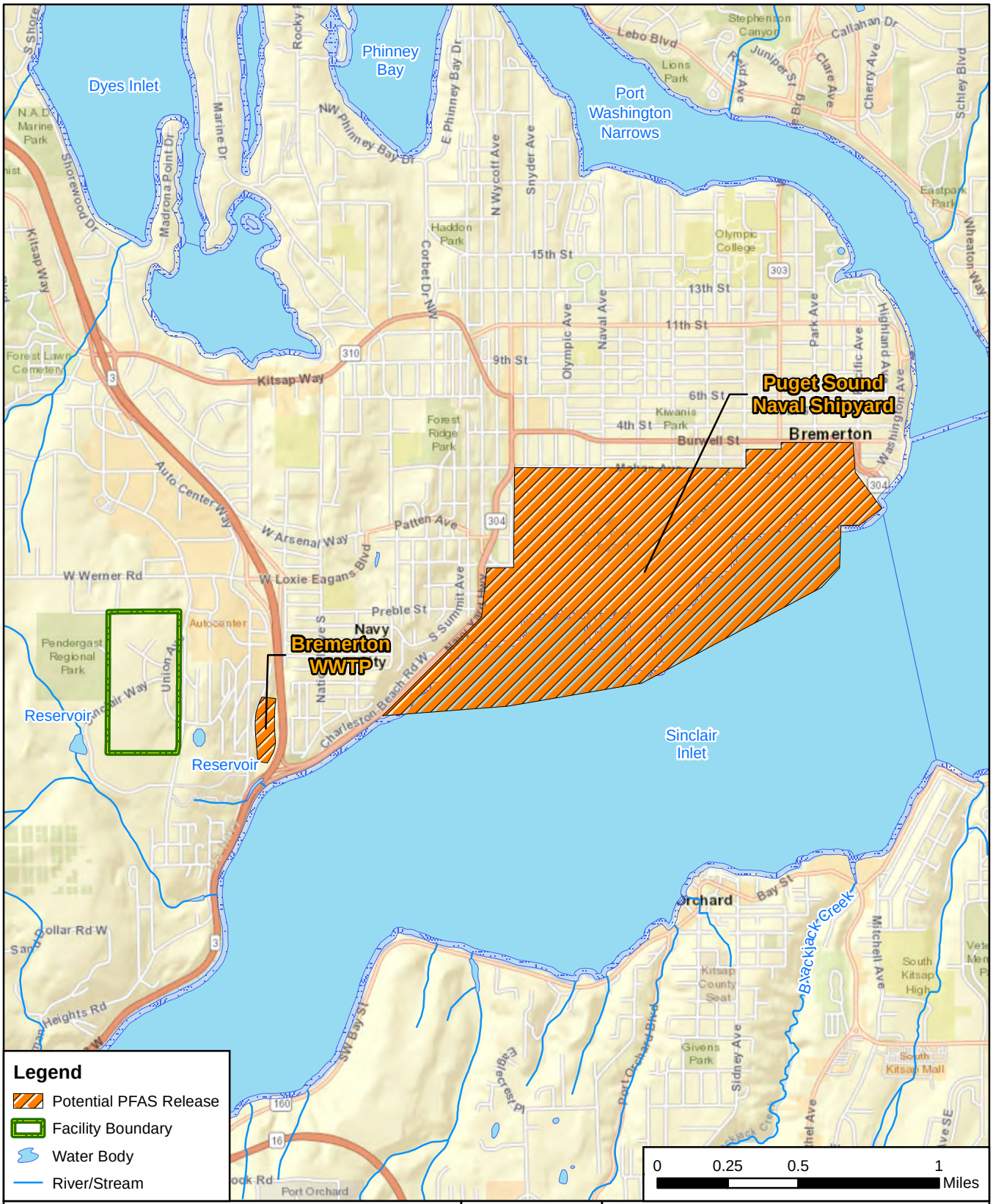
The Bremerton Wastewater Treatment Plant is located approximately 0.25 miles east and hydrologically downgradient of the BRC (City of Bremerton, 2019). This facility is identified as the Westside Wastewater Treatment Plant, servicing the City of Bremerton, and has been in operation since 1985 (City of Bremerton, 2020). Given that this facility handles wastewater from residential, industrial, commercial, and municipal properties throughout the City, there is the potential for PFAS to be present. However, based on its distance and hydrologic downgradient location, the Bremerton Wastewater Treatment Plant is not an off-site concern to the BRC.

The Puget Sound Naval Shipyard Superfund Site is located approximately 1 mile east and hydrologically downgradient of the BRC, along the Sinclair Inlet (USEPA, 2020b). There is the potential for AFFF use historically and currently at this Superfund Site, based on the nature of the facility and the documented use of AFFF by the US Navy since the 1970s (this shipyard has operated since the early 1940s) (USDOD, 2018; USEPA, 2020b). However, based on its distance and hydrologic location—at an elevation substantially lower than the BRC—the Puget Sound Naval Shipyard is not an off-site concern to the BRC.

In addition, the U.S. Navy is conducting PFAS investigations at several U.S. Naval bases in the Puget Sound region to determine groundwater impacts from the U.S. Navy's historical use/releases of PFAS (USDON, 2020a). These bases include Naval Station Whidbey Island, Naval Base Kitsap – Bangor, and Naval Base Kitsap – Bremerton (USDON, 2020a, 2020b). The U.S. Navy documents the most common//likely source of PFAS potentially in groundwater at these installations to have been past use of AFFF (USDON, 2020a). As of 2016, PFOS/PFOA were not detected in groundwater on-base at any of the installations; only PFOA was detected in groundwater at Whidbey Island but concentrations were below EPA's HA (USDON, 2016). As of March 2020, PFOS/PFOA were detected in two drinking water wells (out of 286 tested) located off-base and downgradient of Naval Base Kitsap – Bangor at concentrations above EPA's HA (USDON, 2020c).

Based on USEPA's Unregulated Contaminant Monitoring Rule 3 data, no PFAS were detected in a public water system above the USEPA HA at interties to any of these three U.S. Naval bases, which were tested in 2014 (USEPA, 2017). Naval Base Kitsap – Bremerton is provided with drinking water from the City of Bremerton, which is sourced from regional surface water and groundwater (USDON, 2020d). Naval Base Kitsap – Bangor provides drinking water to over 15,000 people, supplying water from regional groundwater wells (USDON, 2020e). Naval Air Station Whidbey Island provides drinking water to its own community, supplying water from surface water provided by the City of Anacortes (USDON, 2020f).

Based on the distance (ranging from 15 to 80 miles) from the BRC, these U.S. Naval bases are not an off-site concern to the BRC.



CLIENT	ARNG			
NOTES	Preliminary Assessment for PFAS at Bremerton Readiness Center, WA			
REVISED	9/16/2020	GIS BY	MS	9/16/2020
SCALE	1:31,680	CHK BY	MB	9/16/2020
Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	RG	9/16/2020

Adjacent Sources

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Figure 5-1

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6. Preliminary Conceptual Site Model

Based on the PA findings from interviews with facility personnel, on-Post observations, and online research, no AOIs were identified at the BRC. A conceptual site model (CSM) identifies three components necessary for potentially complete exposure pathways related to a site: (1) source, (2) pathway, and (3) receptor. If any of these elements are missing, the pathway is considered incomplete.

Based on the findings of this PA, no PFAS sources originate at the BRC or from activities associated with the BRC, including the BFTC. No complete exposure pathway for PFAS has been identified at the BRC, including the BFTC.

7. Conclusions

This report presents a summary of available information gathered during the PA on the use and storage of AFFF and other PFAS-related activities at the BRC. The PA findings are based on the information presented in **Appendices A** and **B**.

7.1 Findings

Based on information obtained during interviews conducted with facility personnel who have been familiar with the facility since 1999, on-Post observations, and reviewed documentation, no AOIs related to PFAS release(s) were identified at the BRC, including the BFTC. While adjacent PFAS sources were identified, evidence obtained during the PA does not support that current or former ARNG facility activities have contributed to PFAS contamination in soil, groundwater, surface water, or sediment for any receptor. A summary of PA findings is presented in **Figure 7-1**.

7.2 Uncertainty

A number of information sources were investigated during this PA to determine the potential for PFAS-containing materials to have been present, used, or released at the facility. Historically, documentation of PFAS use was not required because PFAS were considered benign. Therefore, records were not typically kept by the facility or available during the PA on the use of PFAS in training, firefighting, or other non-traditional activities, or on its disposition.

The conclusions of this PA are predominantly based on the information provided during interviews with personnel who had direct knowledge that PFAS have never been stored or used at the facility. Gathered information has a degree of uncertainty due to the absence of written documentation, the time passed since PFAS was first used (1969 to present), and a reliance on personal recollection. There is also a possibility the PA has missed a source of PFAS, as the science of how PFAS may enter the environment continually evolves.

In order to minimize the level of uncertainty, readily available information regarding the use and storage of PFAS were reviewed, retired and current personnel were interviewed, multiple persons were interviewed for the same potential source area, and potential source areas were visually inspected. **Table 7-1** summarizes the uncertainties associated with the PA.

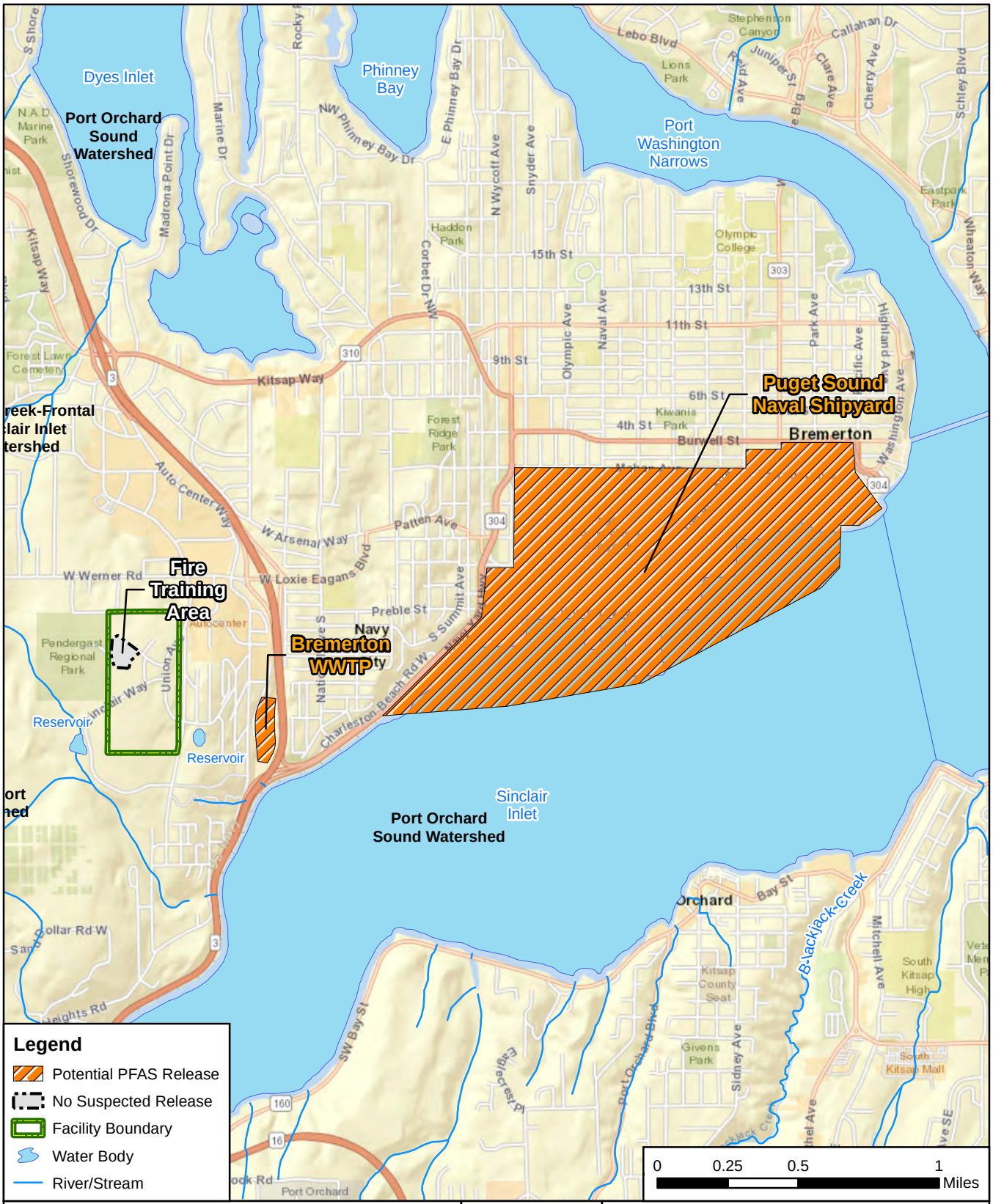
Table 7-1: Uncertainties

Area	Source of Uncertainty
BRC	The BFTC has operated at its current Bremerton location since 1992; limited uncertainty exists regarding facility use prior to 1999, when facility personnel interviewed for this PA began working on-site.
Adjacent Sources	The direction of groundwater flow identified in this report is inferred based on the evaluated topographic gradient; groundwater flow at the BRC can only be known through onsite measurements.

7.3 Potential Future Actions

Based on the documented absence (1999 to present) of the storage, use or release of PFAS-containing materials at the BRC (including the BFTC), no AOIs were identified during the PA. Evidence does not support that current or former ARNG activities having contributed to PFAS

contamination to soil, groundwater, surface water, or sediment at the facility or adjacent areas. Therefore, the facility will not move forward in the CERCLA process.



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Base Map: Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI,		PM	RG	9/16/2020

Summary of Findings

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Figure 7-1

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Appendix A
Data Resources

Data Resources will be provided separately on CD. Data Resources for Bremerton Readiness Center (BRC) include:

State Database Wells

- Figure A-1: State Database Wells & Map Key

BRC Installation Maps

- 2018 Bremerton Stormwater Map
- 2019 Bremerton RC Stormwater Reference Map

Environmental Data Resources, Inc.™ Report

- 2019 EDR™ Report Bremerton Readiness Center

Facility and Adjacent Source Studies

- 2018 Integrated Natural Cultural Resources Management Plan Update for Sites and Training Installations of the Washington Army National Guard, Fiscal Years 2014-2018
- 2018 Navy Water Quality - Naval Base Bangor
- 2018 Navy Water Quality - Naval Base Bremerton
- 2018 Navy Water Quality - Naval Base Whidbey Island
- 2020 EPA Puget Sound Naval Shipyard Superfund Site
- 2020 Navy NAVFAC NW PFAS Drinking Water Investigations
- 2020 Navy Naval Station Whidbey Island PFAS Investigation.pdf

CLIENT	ARNG			
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State Database Wells

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Figure A-1

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Appendix B
Preliminary Assessment Documentation

Appendix B.1
Interview Records

PA Interview Questionnaire - Environmental Manager

Facility: Bremerton Readiness Center (Bremerton, WA)
Interviewer: [redacted]
Date/Time: 11/1/2019

Interviewee: [redacted] **Title:** Environmental Program Supervisor **Phone Number:** [redacted] **Email:** [redacted]	Can your name/role be used in the PA Report? Y or N Can you recommend anyone we can interview? Y or N

1. **Roles or activities with the Facility/years working at the Facility.**

Acting supervisor of the Environmental Program at the Washington Military Department, since beginning of October 2019

2. **Where can I find previous facility ownership information?**

Not aware of documents available pertaining to environmental for the facility.

3. **What can you tell us about the history of PFAS including aqueous film forming foam (AFFF) at the Facility? Was it used for any of the following activities, circle all that apply and indicate years of active use, if known? Identify these locations on a facility map.**

Maintenance
Fire Training Areas
Firefighting (Active Fire)
Crash
Fire Suppression Systems (Hangers/Dining Facilities)
Fire Protection at Fueling Stations
Non-Technical/Recreational/ Pest Management
Metals Plating Facility
Waterproofing Uniforms (Laundry Facilities)
Other

Not aware of past AFFF uses onsite. Not aware of any currently – fire training does occur onsite at the Bremerton Emergency Fire Training Center. None of these listed activities were historically or are currently onsite, with exception for fire training.

4. Fill out CSM Information worksheet with the Environmental Manager.

5. **Are any current buildings constructed with AFFF dispensing systems or fire suppression systems? What are the AFFF/suppression system test requirements? What is the frequency of testing the AFFF/suppression system? Do you have "As Built" drawings for the buildings?**

Not aware of AFFF dispensing systems/fire suppression systems in buildings onsite.
No As-built drawings available.

6. **Are fire suppression systems currently charged with AFFF or have they been retrofitted for use of high expansion foam? If retrofitted, when was that done?**

Not aware if fire suppression systems are present, and if currently charged with AFFF.

7. **How is AFFF procured? Do you have an inventory/procurement system that tracks use?**

Unaware – recommend interviewing current Fire Chief ([redacted]) and retired Fire Chief ([redacted]) at Bremerton Emergency Fire Training Center.

8. **What type of AFFF has been/is being used (3%, 6%, Mil Spec Mil-F-24385, High Expansion)? Manufacturer (3M, Dupont, Ansul, National Foam, Angus, Chemguard, Buckeye, Fire Service Plus)?**

Unaware – recommend interviewing current Fire Chief ([redacted]) and retired Fire Chief ([redacted]) at Bremerton Emergency Fire Training Center.

9. **Where is the AFFF stored? How is it stored (tanks, 55-gallon drums, 5-gallon buckets)? What size are the storage tanks? Is the AFFF stored as a mixed solution (3% or 6%) or concentrated material?**

Unaware – recommend interviewing current Fire Chief ([redacted]) and retired Fire Chief ([redacted]) at Bremerton Emergency Fire Training Center.

10. **How many FTAs are/were on this facility and where are they? Locate on a map. How many FTAs are active and inactive? For inactive FTAs, when was the last time that fire training using AFFF was conducted at them?**

A portion of the property is currently actively used by the Bremerton Emergency Fire Training Center. No inactive fire training areas.

11. **When a release of AFFF occurs during a fire training exercise, now and in the past, how is the AFFF cleaned and disposed of? Were retention ponds built to store discharged AFFF? Was the AFFF trickled to the sanitary sewer or left in the pond to infiltrate?**

Unaware – recommend interviewing current Fire Chief ([redacted]) and retired Fire Chief ([redacted]) at Bremerton Emergency Fire Training Center.

12. **Can you recall specific times when city, county, and/or state personnel came on-post for training? If so, please state which state/county agency or military entity? Do you have any records, including photographs to share with us?**

Unaware – recommend interviewing current Fire Chief ([redacted]) and retired Fire Chief ([redacted]) at Bremerton Emergency Fire Training Center.

13. **Did military routinely or occasionally fire train off-post? List the units that you can recall used/trained at various areas.**

Unaware – recommend interviewing current Fire Chief ([redacted]) and retired Fire Chief ([redacted]) at Bremerton Emergency Fire Training Center.

14. **Did individual units come with their own safety personnel, did they also bring their own AFFF? Was training with AFFF part of these exercises? How were emergencies handled under these circumstances?**

Unaware – recommend interviewing current Fire Chief ([redacted]) and retired Fire Chief ([redacted]) at Bremerton Emergency Fire Training Center.

15. **Are there specific emergency response incident reports (i.e., aircraft or vehicle crash sites and fires)? If so, may we please copy these reports? Who (entity) was the responder?**

Not aware and not likely - no aircraft onsite or airports in vicinity.

16. **Do you have records of fuel spill logs? Was it common practice to wash away fuel spills with AFFF? Is/was AFFF used as a precaution in response to fuel releases or emergency runway landings to prevent fires?**

Not aware of fuel spill logs.
Unaware – recommend interviewing current Fire Chief ([redacted]) and retired Fire Chief ([redacted]) at Bremerton Emergency Fire Training Center.

17. **Was AFFF used for forest fires or fire management on-post/off-post? If so, please describe what happened and who was involved?**

Unaware – recommend interviewing current Fire Chief ([redacted]) and retired Fire Chief ([redacted]) at Bremerton Emergency Fire Training Center.

18. **Are there mutual aid/use agreements between county, city, and local fire department? Please list, even if informal. If formalized, may we have a copy of the agreement?**

The Joint Management Group (JMG) is a collaboration of several fire departments that share use of the fire training center onsite. The JMG has an agreement with each of the fire departments. The JMG leases the fire training center property (and the Bremerton Readiness Center) from the WA Military Department.

19. **Can you provide any other locations where AFFF has been stored, released, or used (i.e. hangars, buildings, fire stations, firefighting equipment testing and maintenance areas, emergency response sites, storm water/surface water, waste treatment plants, and AFFF ponds)?**

Unaware – recommend interviewing current Fire Chief ([redacted]) and retired Fire Chief ([redacted]) at Bremerton Emergency Fire Training Center.

20. **Are you aware of any other creative uses of AFFF? If so, how was AFFF used? What entities were involved?**

Not aware. Unaware – recommend interviewing current Fire Chief ([redacted]) and retired Fire Chief ([redacted]) at Bremerton Emergency Fire Training Center.

21. **Are there past studies you are aware of with environmental information on plants/animals/ groundwater/soil types, etc., such as Integrated Cultural Resources Management Plans or Integrated Natural Resources Management Plans?**

There is an *Integrated Cultural Resources Management Plan* available for the entire state.

22. **What other records might be helpful to us (environmental compliance, investigation records, admin record) and where can we find them?**

Currently not familiar with other environmental reports available for the site.

23. **Do you have or did you have a chrome plating shop on base? What were/are the years of operation of that chrome plating shop?**

Not aware.

24. **Do you know whether the shop has/had a foam blanket mist suppression system or used a fume hood for emissions control? If foam blanket mist suppression was used, where was the foam stored, mixed, applied, etc.?**

N/A

25. **How is off-spec AFFF disposed (used for training, turned in, or given to a local Fire Station)? If applicable, do you know the name of the vendor that removes off-spec AFFF? Do you have copies of the manifest or B/L?**

Unaware – recommend interviewing current Fire Chief ([redacted]) and retired Fire Chief ([redacted]) at Bremerton Emergency Fire Training Center.

26. **Do you recommend anyone else we can interview? If so, do you have contact information for them?**

[redacted] – Maintenance Supervisor (5 years) - @ Camp Murray 1991-2005
[redacted] – Building Manager/Youth Academy Administrator (2 years)
[redacted] – Fire Chief Retired, Bremerton Fire Department (20 years), coordinates Joint Management Group (JMG Secretary) (JMG fire training)
[redacted] – USPFO Property Acquisitions Contractor (met at Camp Murray)
[redacted] – Fire Chief *did not meet onsite* ([redacted]
[redacted] – Fire Training Center Facility Director *did not meet onsite* ([redacted]

PA Interview Questionnaire – Fire Station

Facility: Bremerton Readiness Center (Bremerton, WA)
Interviewer: [redacted]
Date/Time: 11/1/2019

Interviewee: [redacted] **Title:** Fire Chiefs - Bremerton Emergency Fire Training Center **Phone Number:** [redacted] **Email:** n/a	Can your name/role be used in the PA Report? Y or N Can you recommend anyone we can interview? Y or N [redacted]

1. **Roles or activities with the Facility/years working at the Facility.**

[redacted] - Retired Fire Chief for the Bremerton Fire Department, 20 years.
Coordinates the Joint Management Group's fire training (Secretary for the JMG).

[redacted] - Current Fire Chief for the Bremerton Fire Department, familiar with site since 1995

2. **What can you tell us about the history of AFFF at the Facility? Was it used for any of the following activities, circle all that apply and indicate years of active use, if known? Identify these locations on a facility map.**

Maintenance (e.g., ramp washing)
Fire Training Areas
Firefighting (Active Fire)
Crash
Fire Suppression Systems (Hangers/Dining Facilities)
Fire Protection at Fueling Stations
Non-Technical/Recreational/ Pest Management

No AFFF ever used at the facility.
None of these activities occurred/occur onsite, with exception of fire training.

3. **Are any current buildings constructed with AFFF dispensing systems or fire suppression systems? What are the AFFF/suppression system test requirements? What is the frequency of testing at the AFFF/suppression systems?**

No AFFF onsite. No testing.

4. **Are fire suppression systems currently charged with AFFF or have they been retrofitted for use of high expansion foam?**

No.

5. **How is AFFF procured? Do you have an inventory/procurement system that tracks use?**

No AFFF used onsite.

6. **What type of AFFF has been/is being used (3%, 6%, Mil Spec Mil-F-24385, High Expansion)? Manufacturer (3M, Dupont, Ansul, National Foam, Angus, Chemguard, Buckeye, Fire Service Plus)?**

No AFFF.

7. **Is AFFF formulated on base? If so, where is the solution mixed, contained, transferred, etc.?**

Not applicable – site is not a base. No AFFF used onsite.

8. **Where is the AFFF stored? How is it stored (tanks, 55-gallon drums, 5-gallon buckets)? What size are the storage tanks? Is the AFFF stored as a mixed solution (3% or 6%) or concentrated material?**

Not applicable – no AFFF used onsite.

9. **How is the AFFF transferred to emergency response vehicles, suppression systems, flightline extinguishers? Is/was there a specified area on the facility where vehicles are filled with AFFF and does this area have secondary containment in case of spills? How and where are vehicles storing AFFF cleaned/decontaminated?**

Not applicable – no AFFF used onsite. No fire trucks brought to site.

10. **Provide a list of vehicles that carried AFFF, now and in the past, and where are/were they located?**

Not applicable – no AFFF used onsite. No fire trucks brought to site.

11. **Any vehicles have a history of leaking AFFF? Do you/did you test the vehicles spray patterns to make sure equipment is working properly? How often are/were these spray tests performed and can you provide the locations of these tests, now and in the past?**

Not applicable – no AFFF used onsite. No fire trucks brought to site.

12. **How many FTAs are/were on this facility and where are they? Locate on a map. How many FTAs are active and inactive? For inactive FTAs, when was the last time that fire training using AFFF was conducted at them?**

The entire training area is used for fire training – at the fire tower, at the mock helicopter, at the mock Navy submarine, and metal shipping containers.
No inactive FTAs onsite.

13. **What types of fuels/flammables were used at the FTAs?**

All fire training areas use propane.

14. **What was the frequency of AFFF use at each location? When a release of AFFF occurs during a fire training exercise, now and in the past, how is/was the AFFF cleaned and disposed of? Were retention ponds built to store discharged AFFF? Was the AFFF trickled to the sanitary sewer or left in the pond to infiltrate?**

Not applicable – no AFFF used onsite.

15. **Are there mutual aid/use agreements between county, city, local fire department? Please list, even if informal. If formalized, may we have a copy of the agreement? Can you recall specific times when city, county, state personnel came on-post for training? If so, please state which state/county agency, military entity? Do you have any records, including photographs to share with us?**

The Joint Management Group (JMG) is a collaboration of several fire departments (Bremerton Fire Dept, South Kitsap Fire and Rescue, and Central Kitsap Fire and Rescue) and the US Navy that share use of the fire training center onsite. The JMG has an agreement with each of the fire departments and the US Navy. The JMG leases the fire training center property (and the Bremerton Readiness Center) from the WA Military Department. All training occurs onsite at the designated Fire Training Center area.

16. **Did individual units come on-post with their own safety personnel, did they also bring their own AFFF? Was training with AFFF part of these exercises? How were emergencies handled under these circumstances?**

Each fire department and the US Navy bring their own equipment onsite. No fire trucks are brought onsite. No AFFF used onsite.

17. **Did military routinely or occasionally fire train off-post? List units that you can recall used/trained at various areas.**

Not applicable – refer to Environmental Manager.

18. **Are there specific emergency response incident reports (i.e., aircraft or vehicle crash sites and fires)? If so, may we please copy these reports? Who (entity) was the responder?**

No

19. **Do you have records of fuel spill logs? Was it common practice to wash away fuel spills with AFFF? Is/was AFFF used as a precaution in response to fuel releases or emergency runway landings to prevent fires?**

No fuels other than propane used in fire training. No AFFF used onsite.

20. **Was AFFF used for forest fires or fire management on-post/off-post? If so, please describe what happened and who was involved?**

Not applicable – refer to Environmental Manager.

21. **Can you provide any other locations where AFFF has been stored, released, or used (i.e. hangars, buildings, fire stations, firefighting equipment testing and maintenance areas, emergency response sites, storm water/surface water, waste water treatment plants, and AFFF ponds)?**

No AFFF used onsite.

22. **Are you aware of any other creative uses of AFFF? If so, how was AFFF used? What entities were involved?**

No.

23. **How is off-spec AFFF disposed (used for training, turned in, or given to a local Fire Station)? If applicable, do you know the name of the vendor that removes off-spec AFFF? Do you have copies of the manifest or B/L?**

No AFFF used onsite.

24. **Do you recommend anyone else we can interview? If so, do you have contact information for them?**

[redacted] (Facilities Director)

PA Interview Questionnaire – Fire Station

Facility: Bremerton Readiness Center (Bremerton, WA)
Interviewer: [redacted]
Date/Time: 11/1/2019

Interviewee: [redacted] **Title:** [redacted], WRG Fire Training Systems Director, Bremerton Emergency Fire Training Center **Phone Number:** [redacted] **Email:** [redacted]	Can your name/role be used in the PA Report? Y or N Can you recommend anyone we can interview? Y or N [redacted]

1. **Roles or activities with the Facility/years working at the Facility.**

Director of the Fire Training Center's fire training simulation systems (WRG) since 2003.

2. **What can you tell us about the history of AFFF at the Facility? Was it used for any of the following activities, circle all that apply and indicate years of active use, if known? Identify these locations on a facility map.**

Maintenance (e.g., ramp washing)
Fire Training Areas
Firefighting (Active Fire)
Crash
Fire Suppression Systems (Hangers/Dining Facilities)
Fire Protection at Fueling Stations
Non-Technical/Recreational/ Pest Management

No AFFF ever used at the facility.
None of these activities occurred/occur onsite, with exception of fire training.

3. **Are any current buildings constructed with AFFF dispensing systems or fire suppression systems? What are the AFFF/suppression system test requirements? What is the frequency of testing at the AFFF/suppression systems?**

No AFFF onsite. No testing.

4. **Are fire suppression systems currently charged with AFFF or have they been retrofitted for use of high expansion foam?**

No.

5. **How is AFFF procured? Do you have an inventory/procurement system that tracks use?**

No AFFF used onsite.

6. **What type of AFFF has been/is being used (3%, 6%, Mil Spec Mil-F-24385, High Expansion)? Manufacturer (3M, Dupont, Ansul, National Foam, Angus, Chemguard, Buckeye, Fire Service Plus)?**

No AFFF.

7. **Is AFFF formulated on base? If so, where is the solution mixed, contained, transferred, etc.?**

Not applicable – site is not a base. No AFFF used onsite.

8. **Where is the AFFF stored? How is it stored (tanks, 55-gallon drums, 5-gallon buckets)? What size are the storage tanks? Is the AFFF stored as a mixed solution (3% or 6%) or concentrated material?**

Not applicable – no AFFF used onsite.

9. **How is the AFFF transferred to emergency response vehicles, suppression systems, flightline extinguishers? Is/was there a specified area on the facility where vehicles are filled with AFFF and does this area have secondary containment in case of spills? How and where are vehicles storing AFFF cleaned/decontaminated?**

Not applicable – no AFFF used onsite. No fire trucks brought to site.

10. **Provide a list of vehicles that carried AFFF, now and in the past, and where are/were they located?**

Not applicable – no AFFF used onsite. No fire trucks brought to site.

11. **Any vehicles have a history of leaking AFFF? Do you/did you test the vehicles spray patterns to make sure equipment is working properly? How often are/were these spray tests performed and can you provide the locations of these tests, now and in the past?**

Not applicable – no AFFF used onsite. No fire trucks brought to site.

12. **How many FTAs are/were on this facility and where are they? Locate on a map. How many FTAs are active and inactive? For inactive FTAs, when was the last time that fire training using AFFF was conducted at them?**

The entire training area is used for fire training – at the fire tower, at the mock helicopter, at the mock Navy submarine, and metal shipping containers.
No inactive FTAs onsite.

13. **What types of fuels/flammables were used at the FTAs?**

All fire training areas use propane.

14. **What was the frequency of AFFF use at each location? When a release of AFFF occurs during a fire training exercise, now and in the past, how is/was the AFFF cleaned and disposed of? Were retention ponds built to store discharged AFFF? Was the AFFF trickled to the sanitary sewer or left in the pond to infiltrate?**

Not applicable – no AFFF used onsite.

15. **Are there mutual aid/use agreements between county, city, local fire department? Please list, even if informal. If formalized, may we have a copy of the agreement? Can you recall specific times when city, county, state personnel came on-post for training? If so, please state which state/county agency, military entity? Do you have any records, including photographs to share with us?**

The Joint Management Group (JMG) is a collaboration of several fire departments (Bremerton Fire Dept, South Kitsap Fire and Rescue, and Central Kitsap Fire and Rescue) and the US Navy that share use of the fire training center onsite. The JMG has an agreement with each of the fire departments and the US Navy. The JMG leases the fire training center property (and the Bremerton Readiness Center) from the WA Military Department. All training occurs onsite at the designated Fire Training Center area. The JMG has a sub-lease with WRG for use of the fire training tower; the Navy is not included in the sub-lease but the lease includes use of the tower for all involved in training.

16. **Did individual units come on-post with their own safety personnel, did they also bring their own AFFF? Was training with AFFF part of these exercises? How were emergencies handled under these circumstances?**

Each fire department and the US Navy bring their own equipment onsite. No fire trucks are brought onsite. No AFFF used onsite.

17. **Did military routinely or occasionally fire train off-post? List units that you can recall used/trained at various areas.**

Not applicable - refer to Environmental Manager

18. **Are there specific emergency response incident reports (i.e., aircraft or vehicle crash sites and fires)? If so, may we please copy these reports? Who (entity) was the responder?**

No

19. **Do you have records of fuel spill logs? Was it common practice to wash away fuel spills with AFFF? Is/was AFFF used as a precaution in response to fuel releases or emergency runway landings to prevent fires?**

No fuels other than propane used in fire training. No AFFF used onsite.

20. **Was AFFF used for forest fires or fire management on-post/off-post? If so, please describe what happened and who was involved?**

Not applicable - refer to Environmental Manager

21. **Can you provide any other locations where AFFF has been stored, released, or used (i.e. hangars, buildings, fire stations, firefighting equipment testing and maintenance areas, emergency response sites, storm water/surface water, waste water treatment plants, and AFFF ponds)?**

No AFFF used onsite.

22. **Are you aware of any other creative uses of AFFF? If so, how was AFFF used? What entities were involved?**

No.

23. **How is off-spec AFFF disposed (used for training, turned in, or given to a local Fire Station)? If applicable, do you know the name of the vendor that removes off-spec AFFF? Do you have copies of the manifest or B/L?**

No AFFF used onsite.

24. **Do you recommend anyone else we can interview? If so, do you have contact information for them?**

[redacted](WRG)

PA Interview Questionnaire - Other

Facility: Bremerton Readiness Center (Bremerton, WA)
Interviewer: [redacted]
Date/Time: 11/1/2019

Interviewee: [redacted] **Title:** Contract Specialist, Washington Military Department **Phone Number:** see below **Email:** [redacted]	Can your name/role be used in the PA Report? Y or N Can you recommend anyone we can interview? Y or N _____

Roles or activities with the Facility/Years working at the Facility:

Property Acquisitions Contractor for the WA National Guard (at Camp Murray, WA) – has been familiar with Bremerton Readiness Center since it was developed (2004)

PFAS Use:
Identify accidental/intentional release locations, time frame of release, frequency of releases, storage container size (maintenance, fire training, firefighting, buildings with suppression systems (as builts), fueling stations, crash sites, pest management, recreational, dining facilities, metals plating, or waterproofing). How are materials ordered/purchased/disposed/shared with others?

Fire training occurs at the Bremerton facility – at the Fire Training Center area. Use of AFFF during fire training is unknown. Not aware of specific fire training activities – recommend contacting Bremerton Fire Training Center.

Known Uses
Use
Procurement
Disposition
Storage (Mixed)
Storage (Solution)
Inventory, Off-Spec
Containment
SOP on Filling
Leaking Vehicles
Nozzle and Suppression System Testing
Dining Facilities
Vehicle Washing
Ramp Washing
Fuel Spill Washing and Fueling Stations
Chrome Plating or Waterproofing

PA Interview Questionnaire - Other

Facility: Bremerton Readiness Center (Bremerton, WA)
Interviewer: [redacted]
Date/Time: 11/1/2019

Interviewee: [redacted] **Title:** Maintenance Supervisor **Phone Number:** see below **Email:** connect through [redacted]	Can your name/role be used in the PA Report? Y or N Can you recommend anyone we can interview? Y or N _____

Roles or activities with the Facility/Years working at the Facility:

Maintenance Supervisor of the Bremerton Readiness Center building since 2014. Was at Camp Murray 1991-2005.

PFAS Use:
Identify accidental/intentional release locations, time frame of release, frequency of releases, storage container size (maintenance, fire training, firefighting, buildings with suppression systems (as builts), fueling stations, crash sites, pest management, recreational, dining facilities, metals plating, or waterproofing). How are materials ordered/purchased/disposed/shared with others?

Fire training occurs at the Bremerton facility – at the Fire Training Center area. Fire suppression system is in the building – water only. ABC fire extinguishers throughout the building – Purple K fire extinguisher in kitchen.

Known Uses
Use
Procurement
Disposition
Storage (Mixed)
Storage (Solution)
Inventory, Off-Spec
Containment
SOP on Filling
Leaking Vehicles
Nozzle and Suppression System Testing
Dining Facilities
Vehicle Washing
Ramp Washing
Fuel Spill Washing and Fueling Stations
Chrome Plating or Waterproofing

Appendix B.2
Visual Site Inspection Checklists

Visual Site Inspection Checklist

Names(s) of people performing VSI: [redacted]

Recorded by: [redacted]

ARNG Contact: [redacted]

Date and Time: 11/1/2019

Method of visit (walking, driving, adjacent): Walking

Source/Release Information

Site Name / Area Name / Unique ID: Bremerton Readiness Center / Bremerton International Emergency Services Training Center (Bremerton, WA)

Site / Area Acreage: 85 total (8.2 acres at the fire training center; 40 acres total for the BRC building and the FTC)

Historic Site Use (Brief Description):

BRC is used as a joint fire training and emergency services facility.

Fire Training Center (since 1992) - joint training among local fire departments and the US Navy: Bremerton Fire Dept, South Kitsap Fire and Rescue, and Central Kitsap Fire and Rescue. Managed/financed by Joint Management Group (JMG) (formed by Kitsap County Fire Dept, Olympic College, and the US Navy), leasing the property from the WA Military Department, and agreement among the fire departments/US Navy for its use.

Bremerton Readiness Center at the Bremerton National Guard Armory (constructed in 2004) - regional training center with classrooms, a gymnasium, and dining facility. Purpose is to be used for preparation of local officials to deal with terrorist attacks and emergency situations, and also be an alternate location for the WA State Emergency Management Center (headquartered in Camp Murray). The Readiness Center is used by the US Navy, Olympic College programs, and most county fire districts in the area.

WA Youth Academy (constructed in 2008) - military training and mentoring program school for at-risk youth.

Current Site Use (Brief Description): Same as above.

Physical barriers or access restrictions: None

1. Was PFAS used (or spilled) at the site/area? **Y / (N)**

1a. If yes, document how PFAS was used and usage time (e.g., fire fighting training 2001 to 2014):

2. Has usage been documented? **Y / (N)**

2a. If yes, keep a record (place electronic files on a disk):

3. What types of businesses are located near the site? **(Industrial) / (Commercial) / Plating / Waterproofing / (Residential)**

3a. Indicate what businesses are located near the site

Site is located in a commercial/residential of Bremerton, WA. Offsite: Pendergast Regional Park (adjacent east), Kitsap County Coroner (adjacent northeast); residential (east, north/northwest); commercial (northeast); church (northwest); schools (north/east); Puget Sound Naval Shipyard (southeast)

4. Is this site located at an airport/flightline? **Y / (N)**

4a. If yes, provide a description of the airport/flightline tenants:

Visual Survey Inspection Log

Other Significant Site Features:

1. Does the facility have a fire suppression system? **(Y) / N**

1a. If yes, indicate which type of AFFF has been used:

Water only

1b. If yes, describe maintenance schedule/leaks:

As needed

1c. If yes, how often is the AFFF replaced:

n/a

1d. If yes, does the facility have floor drains and where do they lead? Can we obtain an as built drawing?

Stormwater map provided. Drains lead to stormwater conveyance system onsite.

Transport / Pathway Information

Migration Potential:

1. Does site/area drainage flow off installation? **(Y) / N**

1a. If so, note observation and location:

The topography of the site various throughout. Drains/stormwater conveyance located throughout site, connected to stormwater retention ponds.

2. Is there channelized flow within the site/area? **(Y) / N**

2a. If so, please note observation and location:

See comment above and refer to stormwater map

3. Are monitoring or drinking water wells located near the site? **Y / (N)**

3a. If so, please note the location:

Yes, several groundwater monitoring wells are located onsite at the former landfill (in the western portion).

4. Are surface water intakes located near the site? **Y / (N)**

4a. If so, please note the location:

5. Can wind dispersion information be obtained? **(Y / N)**

5a. If so, please note and observe the location.

Possibly from NOAA.

6. Does an adjacent non-ARNG PFAS source exist? **Y / (N)**

6a. If so, please note the source and location.

6b. Will off-site reconnaissance be conducted?	**Y / N**	

Visual Survey Inspection Log

Significant Topographical Features:

1. Has the infrastructure changed at the site/area? **Y / N**

1a. If so, please describe change (ex. Structures no longer exist):

Development over time of buildings.

2. Is the site/area vegetated? **Y / N**

2a. If not vegetated, briefly describe the site/area composition:

Vegetated areas and paved areas throughout the facility.

3. Does the site or area exhibit evidence of erosion? **Y / N**

3a. If yes, describe the location and extent of the erosion:

No areas in particular observed.

4. Does the site/area exhibit any areas of ponding or standing water? **Y / N**

4a. If yes, describe the location and extent of the ponding:

No areas in particular observed - weather was dry during site visit. Three stormwater retention ponds are located throughout the site in low lying areas.

Receptor Information

1. Is access to the site restricted? **Y / N**

1a. If so, please note to what extent:

There are locked gates around the perimiter but other areas of the property have open access.

2. Who can access the site? **Site Workers / Construction Workers / Trespassers / Residential / Recreational Users / Ecological**

2a. Circle all that apply, note any not covered above:

All

3. Are residential areas located near the site? **Y / N**

3a. If so, please note the location/distance:

Immediately adjacent to the northwest. A public park is located immediately adjacent to the west.

4. Are any schools/day care centers located near the site? **Y / N**

4a. If so, please note the location/distance/type:

WA Youth Academy onsite. Schools located to the north/northeast in City limits

5. Are any wetlands located near the site? **Y / N**

5a. If so, please note the location/distance/type:

Adjacent to to the west.

Appendix C
Photographic Log

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Bremerton Readiness Center	Bremerton, Washington

Photograph No. 1

Description:

View looking southwest at the Fire Training Center area, located north of the Bremerton Readiness Center building. The fire tower is visible in the background, equipped with propane and a water suppression system.

1 November 2019

Photograph No. 2

Description:

View looking east at the mock helicopter used for fire training at the Fire Training Center area, located north of the Bremerton Readiness Center building. Propane piping is constructed beneath the concrete pad to simulate fire. A water hose is located in the background (left).

1 November 2019

APPENDIX C – Photographic Log

Army National Guard, Preliminary Assessment for PFAS	Bremerton Readiness Center	Bremerton, Washington

Photograph No. 3

Description:

View of the mock helicopter actively being used for fire training at the Fire Training Center area. Note the water hoses used connected to the pipe located to the left.

Source: Smith, Bob. 2017. Emergency Services Training Center is Firefighting Supersite. Kitsap Daily News. Sept 1. Available at https://www.kitsapdailynews.com/news/emergency-services-training-center-is-firefighting-supersite/. Accessed November 15, 2019.

Photograph No. 4

Description:

View looking north at the stormwater retention pond along the northern property boundary, north and hydraulically downgradient of the Fire Training Center area.

1 November 2019