FINAL

ENVIRONMENTAL ASSESSMENT

National Oceanic and Atmospheric Administration
National Marine Fisheries Service

Manchester Research Station Seawater System Replacement and Campus Addition Project

Manchester, Washington

Prepared for:

National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northwest Fisheries Science Center

Prepared by:

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March 2023

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EXECUTIVE SUMMARY

The National Oceanic and Atmospheric Administration's (NOAA) Northwest Fisheries Science Center (NWFSC) operates its Manchester Research Station (MRS) on the western shoreline of Clam Bay in Puget Sound, approximately one mile north of Manchester, Washington. The MRS property, located at 7305 Beach Drive East, Port Orchard, WA 98366, is part of the 31-acre Manchester Annex (Assessor's Parcel Number 162402-1-001-2005) within unincorporated Kitsap County.

The Proposed Action involves the installation of a new seawater treatment, distribution system and head tank to replace the existing system at the MRS, and the construction of up to four additional single or two-story buildings to house hatcheries, laboratories and offices at the site. The proposed replacement seawater processing, distribution, and depuration system would be designed to deliver processed water to a common head tank capable of supplying existing and future NOAA fisheries and aquaculture operations within the MRS. The proposed design is also designed to reduce overall seawater system operation and maintenance costs and to increase reliability.

This environmental assessment analyzed the topics indicated below in Table ES-1 for the Preferred Alternative, Action Alterative 1, and the No-Action Alternative. No significant impact would result from the Preferred Alternative or Action Alternative 1, as defined in this document, provided that recommended mitigation measures are implemented, and associated state and federal regulatory permits are acquired. A summary of impacts and mitigation for the Preferred Alternative and Action Alternative 1 are presented Table ES-1. The No-Action Alternative would have no impacts.

The following environmental permits, consultations, and other compliance actions would be required for the Preferred Alternative:

- National Pollutant Discharge Elimination System Construction Stormwater General Permit from the United States Environmental Protection Agency, in accordance with the Clean Water Act.
- Determination of No Adverse Effects from the Advisory Council on Historic Preservation and Tribal Historic Preservation Officer and associated consultation in accordance with Section 106 of the National Historic Preservation Act.
- Consultation with Kitsap County and review/consideration of requirements for the County's Critical Area Review, Grading, and Building Permits in accordance with the Public Buildings Amendments Act.
- Submittal of Coastal Consistency Determination to Washington State Department of Ecology, in accordance with the Coastal Zone Management Act.

Table ES-1 Summary of Preferred Alternative Impacts and Mitigation

Environmental Topic	Impact of Preferred Alternative	Impact of Action Alternative 1	Applicable BMPs and Recommended Mitigation
Land Use	No impact	No impact	None
Geological Resources	Minor	Minor	**BMPs** for stormwater and erosion control. **Compliance** with OSHA excavation standards.
Climate Change and Sea Level Rise	Minor	Minor	**BMPs** for reducing equipment emissions during construction.
Air Quality	Minor	Minor	**BMPs** for dust control and reducing equipment emissions during construction. **Compliance** with Puget Sound Clean Air Agency rules and regulations pertaining to emission standards for construction equipment.
Water Resources and Hydrological Processes	Minor	Minor	**BMPs** for stormwater and erosion control during construction, in accordance with a Stormwater Pollution Prevention Plan (SWPPP) prepared in compliance with EPA's Construction Stormwater General Permit. **Compliance** with Section 438 of the Energy Independence and Security Act. **MM 4.5-1: Maintain Pre-development Hydrology** **MM 4.17-1: Environmental Media Management Plan**
Recreational Resources	Minor	Minor	**BMPs** for dust control during construction. **MM 4.13-2: Preconstruction Coordination and Notification**
Cultural Resources	Negligible	Negligible	**BMPs** and standard protocols for inadvertent discoveries, if encountered, would be followed in consultation with Department of Archaeology and Historic Preservation.
Flora and Fauna	Minor	Minor	**BMPs** for stormwater and erosion control during construction. **MM 4.8-1: Noxious Weed Control** **MM 4.8-2: Pre-Construction Surveys for Nesting Birds**
Wetlands	No Impact	No Impact	**BMPs** for stormwater and erosion control and for wetland avoidance during construction. **MM 4.9-1: Wetland Delineation and Avoidance**
Floodplains	No Impact	No Impact	**BMPs** for stormwater and erosion control during construction.
Coastal Zone Management	Negligible	Negligible	None
Farmlands	No Impact	No Impact	None

Environmental Topic	Impact of Preferred Alternative	Impact of Action Alternative 1	Applicable BMPs and Recommended Mitigation
Noise	Moderate	Moderate	**BMPs** for noise reduction during construction. **MM 4.13-1: Restrict construction hours** **MM 4.13-2: Preconstruction coordination and notification**
Transportation	Minor	Minor	**BMPs** for temporary traffic control during construction. **MM 4.14-1: Utilize a designated haul route.** **MM 4.14-2: Preconstruction coordination and notification.** **MM 4.14-3: Develop roadway closure and traffic detour plan.**
Utilities and Solid Waste	Negligible	Negligible	None
Visual Resources	Negligible	Negligible	None
Hazardous Materials	Minor to Moderate	Minor to Moderate	**BMPs** for stormwater and erosion control during construction. **MM 4.17-1: Environmental Media Management Plan** **MM 4.17-2: Implement Institutional Controls** **MM 4.17-2: Site-Specific Health and Safety Plan**
Public Services	Negligible	Negligible	None
Cumulative Effects	Negligible	Negligible	None

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APPENDICES

ACRONYMS

µg/kg	micrograms per kilogram
APE	area of potential effects
ASD	Assistant Secretary of Defense
BMPs	best management practices
CAAP	Concentrated Aquatic Animal Production
CDP	Census Designated Place
CEQ	Council of Environmental Quality
CFR	Code of Federal Regulations
CY	cubic yard
dB	decibel
dBA	A-weighted decibel
DNR	Washington State Division of Natural Resources
DPS	Distinct Population Segment
EA	Environmental Assessment
Ecology	Washington State Department of Ecology
EDNA	Environmental Designation for Noise Abatement
EFH	Essential Fish Habitat
EISA	Energy Independence and Security Act of 2007
ENR	enhancing natural recovery
EO	Executive Order
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FPPA	Farmland Protection Policy Act
GHG	Greenhouse Gas
JARPA	Joint Aquatic Resource Permit Application
KCC	Kitsap County Code
L_{dn}	day-night noise level
L_{eq}	Equivalent Noise Level
L_{max}	Maximum Noise Level
L_{min}	Minimum Noise Level
LOD	limit of disturbance
MBTA	Migratory Bird Treaty Act
MMPA	Marine Mammal Protection Act
MRS	Manchester Research Station
MSL	mean sea level
MTCA	Model Toxics Control Act
NAAQS	National Ambient Air Quality Standards
NAVD88	North American Vertical Datum of 1988
NEPA	National Environmental Policy Act
ng/g	nanograms per gram

NMFS	National Marine Fisheries Service (also known as NOAA Fisheries)
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Eliminations System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWFSC	Northwest Fisheries Science Center
NWI	National Wetland Inventory
OSHA	Occupational Safety and Health Administration
PFAS	Per- and polyfluoroalkyl substances
PFBS	Perfluorobutane sulfonate
PFHxS	perfluorohexansulfonic acid
PFNA	perfluorononanoic acid
PFOA	Perfluorooctanoic acid
PFOS	Perfluorooctane sulfonate
PHS	Priority Habitats and Species
PM	particulate matter
PM_{10}	coarse PM, aerodynamic diameter less than or equal to 10 microns.
$PM_{2.5}$	fine PM, aerodynamic diameter less than or equal to 2.5 microns
ppm	parts per million
PPV	peak particle velocity
PSCAA	Puget Sound Clean Air Agency
RCW	Revised Code of Washington
RMS	root-mean-square
ROD	Record of Decision
RPMD	Real Property Management Division
SF	square feet/square foot
SMP	Shoreline Management Program
SWPPP	Stormwater Pollution Prevention Plan
TPH	Total petroleum hydrocarbon
U.S.	United States
USACE	United States Army Corps of Engineers
USC	United States Code
USFWS	United States Fish and Wildlife Service
UST	underground storage tank
UV	ultraviolet
VdB	vibration decibels
WAC	Washington Administrative Code
WDFW	Washington State Department of Fish and Wildlife
WQC	Water Quality Certification
WSDOT	Washington State Department of Transportation

1 PURPOSE AND NEED

1.1 INTRODUCTION

1.1.1 Overview

The National Marine Fisheries Service (NMFS) is one of several Line Offices within the National Oceanic and Atmospheric Administration (NOAA), a branch of the United States (U.S.) Department of Commerce. NMFS is informally known as NOAA Fisheries. NMFS has six science centers and five regional headquarters nationally and is responsible for the stewardship and management of the nation's living marine resources and their habitat within the U.S. exclusive economic zone.

The NMFS Northwest Fisheries Science Center (NWFSC) conducts leading-edge data acquisition, research and analyses that provide the foundation for management decisions to protect, recover, restore, and sustain ecosystems and living marine resources in the Pacific Northwest. It also supports the NMFS West Coast Regional Office and other agencies in managing more than 90 commercially important fish species; recovering over 30 threatened and endangered fish and marine mammal species; and identifying coastal and ocean health risks. In addition to the NWFSC regional headquarters located in the Montlake neighborhood of Seattle, Washington, there are five research stations throughout the Pacific Northwest (see Figure 1.1-1). One of these five stations is the NWFSC Manchester Research Station (MRS or the research station), located at 7305 Beach Drive East, Port Orchard, WA 98366, on the western shoreline of Clam Bay in Puget Sound, approximately one mile north of Manchester, Washington.

NMFS and NWFSC are proposing to install a replacement seawater treatment and construct up to four new research laboratory/office buildings at the MRS in two phases. Phase 1 would include the design and installation of a replacement seawater processing, distribution, and depuration system and deliver processed water to a common head tank capable of supplying existing and future fisheries and aquaculture operations for the entire facility. The proposed design is intended to reduce overall seawater system operation and maintenance costs and to make the system more reliable. Phase 2 would include the construction of up to four new buildings on the site to accommodate expanded program requirements identified by NOAA as part of their 2022 Site Master Plan. The new buildings would provide laboratories, hatcheries, office space, and storage areas to serve the Environmental and Fisheries Science and Conservation Biology Divisions or both.

NOAA has determined that the potential for significant environmental effects is uncertain and that at this time preparation of an Environmental Assessment (EA) is the appropriate level of review under the National Environmental Policy Act (NEPA).

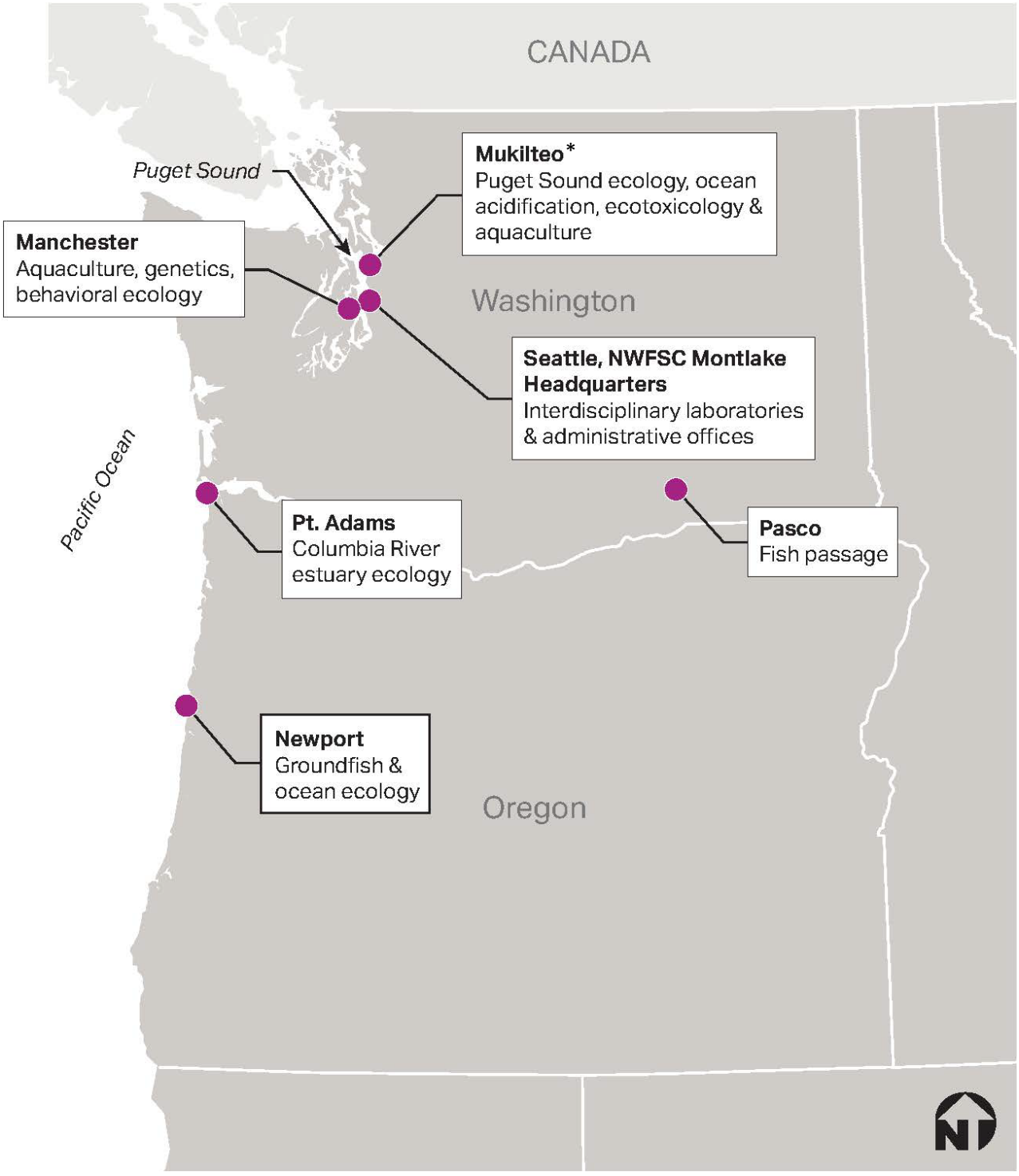


Figure 1.1-1 NWFSC Research Stations

* Mukilteo Research Station closed in 2021.

1.1.2 Background

NWFSC has operated the MRS since the 1970s, which is the largest marine research station within NOAA. Science undertaken at the MRS facility supports NMFS' efforts to conserve at-risk and endangered Pacific salmon, develop ecologically sustainable aquaculture, advance marine fish and shellfish biology, and restore marine habitat (NMFS 2022). Because of its location in western Puget Sound, it is an ideal location for aquaculture and Puget Sound ecosystem research. The site is adjacent to a Department of Defense fuel tank farm and was formerly used by the Navy as a fire training facility.

1.2 PROPOSED ACTION

NOAA's Proposed Action involves the installation of a replacement seawater treatment and distribution system MRS and the construction of up to four new buildings at the MRS, as described in Section 2.1, *Preferred Alternative*. The proposed replacement seawater processing, distribution, and depuration system would be designed to deliver processed water to a common head tank capable of supplying existing and future NOAA fisheries and aquaculture operations within the MRS. The proposed design is also designed to reduce overall seawater system operation and maintenance costs and to increase reliability. The new buildings would provide laboratories, hatcheries, office space, and storage areas to serve the Environmental and Fisheries Science and Conservation Biology Divisions or both.

1.3 PURPOSE AND NEED

1.3.1 Purpose

The NWFSC mission supports the conservation and management of living marine resources and their habitats in the Northeast Pacific Ocean. The MRS is the NWFSC's premier marine culture and experimental research station, developing state-of-the-art technology for salmonid and marine fish culture. The research performed helps support sound decisions that build sustainable fisheries, recover endangered and threatened species, sustain healthy ecosystems, and expand domestic seafood production through sustainable marine aquaculture.

The purpose of the Proposed Action is to build up space to accommodate expanded program requirements identified by NOAA as part of their 2022 Site Master Plan (Iron Horse Architects 2022) and to more reliably meet both the existing and future demand for the continuation of established MRS fisheries research that the existing seawater system cannot support. The existing seawater system has been incrementally developed over thirty years and provides 2,500 gallons per minute (GPM) of filtered and ultraviolet (UV)-treated seawater from the Puget Sound, distributing it to over a dozen distinct fish rearing and research buildings and tanks throughout the station.

The Proposed Action would provide adequate research and wet laboratory facilities and a more reliable and efficient seawater filtration, distribution and disposal system to serve existing and future marine aquaculture research operations and to reduce operational and maintenance costs.

1.3.2 Need

The NWFSC is a leader in the development of aquaculture for salmon and steelhead as well as new marine species for commercial aquaculture. Core research at the MRS includes both restoration and commercial aquaculture of shellfish and anadromous and marine finfish. All of this research depends on seawater systems for source water intake, treatment, distribution and depuration.

With expansion of marine aquaculture under directives of NOAA and NMFS Strategic Plans as well as the Executive Order 13921 Promoting American Seafood Competitiveness and Economic Growth, the facilities needed for marine aquaculture research need to increase. In 2022, a master planning process was undertaken for the MRS (Iron Horse Architects 2022) by NOAA with the following goals and objectives:

- Consider and meet near and long-term operational requirements for NMFS including expansion of the marine aquaculture program to include program space to be moved from NMFS Mukilteo and Montlake Research Stations, along with prospective future programs that include the NOAA Diving Center and Office of Marine and Aviation Operations Marine Operations Center – Pacific relocation.
- Plan and preserve areas on the MRS campus for the new seawater system including equipment and supply corridors while avoiding the existing system.
- Provide a cohesive site master plan that identifies strategic locations for future buildings to accommodate the expanded program requirements identified by NOAA.

The current seawater distribution system at the site is only minimally able to meet the current needs of the MRS and is not sufficient for anticipated future use. The pumping, filtering and distribution systems are a mixture of components that were installed in an ad-hoc fashion, and do not provide a coherent, reliable system to meet current or future needs. The Proposed Action will restore the integrity of the flowthrough water supply and discharge system that is vital for this laboratory and the success of its research mission.

2 PROPOSED ACTION AND ALTERNATIVES

2.1 PREFERRED ALTERNATIVE

2.1.1 Location and Land Use

The NOAA property supporting the NWFSC MRS is in unincorporated Kitsap County, approximately one mile north of Manchester, Washington. The property is a part of the 31-acre Manchester Annex (Assessor's Parcel Number 162402-1-001-2005) and located in a rural industrial complex on the western shore of Clam Bay in Puget Sound (see Figure 2.1-1 and Figure 2.1-2). The Annex is within Section 16, Township 24 North, Range 02 East, Willamette Principal Meridian, Washington. The Annex is owned by the US federal government, with the US Environmental Protection Agency (EPA) and the Department of Commerce NOAA as holding agencies. The southern 22.5-acre portion of the Annex (hereafter referred to as the NOAA property or the MRS) is occupied by NWFSC's MRS laboratory facilities. The northern portion of the Annex (to the northeast of the MRS) is currently occupied by EPA's Manchester Environmental Laboratory. The street address of the MRS is 7305 Beach Drive East, Manchester, Washington, 98353.

The southeastern portion of the NOAA property is largely developed with various buildings, laboratories, parking and hardscaping areas and landscaping, as shown on Figure 2.1-3. The northwestern portion of the NOAA property is heavily vegetated with limited structures. The main driveway passes from the southwest corner to the northeast corner and continues to provide access to the EPA facility to the northeast. A branch from the main driveway connects with Manchester State Park to the north, but is gated and not available for public access. The adjacent property to the south is owned by the Navy, which leases two buildings (Buildings 4 and 5) to the NWFSC MRS.

More details on existing conditions at the site are provided in Section 3.0, *Existing Environment* and in the Affected Environment subsections for each resource topic in Section 4.0, *Affected Resources and Environmental Consequences*.

2.1.2 Components of Preferred Alternative

The Preferred Alternative would include the installation of a new seawater treatment and distribution system to replace the existing system (Phase 1), as well as construction of up to four new buildings to provide additional space and facilities for anticipated future research needs (Phase 2). Detailed design for the seawater system has not been completed, and design for the proposed buildings has not yet commenced, therefore, the exact details, number of buildings, dimensions, layout and/or footprint of the proposed components may change during the design process. The proposed site plan, based on currently available design details, is shown on Figure 2.1-4.

Proposed components of the Preferred Alternative would be installed within an approximately 11-acre portion of the NOAA property, shown in Figure 2.1-5 as the Limits of Disturbance (LOD). The LOD defines the maximum limits within which the proposed components would be constructed, and also includes any areas of temporary disturbance such as tree trimming and project staging areas. Areas outside of the LOD would not be disturbed as part of the Preferred Alternative. Areas within the LOD could be disturbed, depending on final design, but the total amount of development within the LOD

would be limited to the extent described within this EA. No changes to the existing offshore facilities (e.g., number, location, size, or use of the net-pens) are proposed as part of the Preferred Alternative.

SEAWATER TREATMENT AND DISTRIBUTION SYSTEM

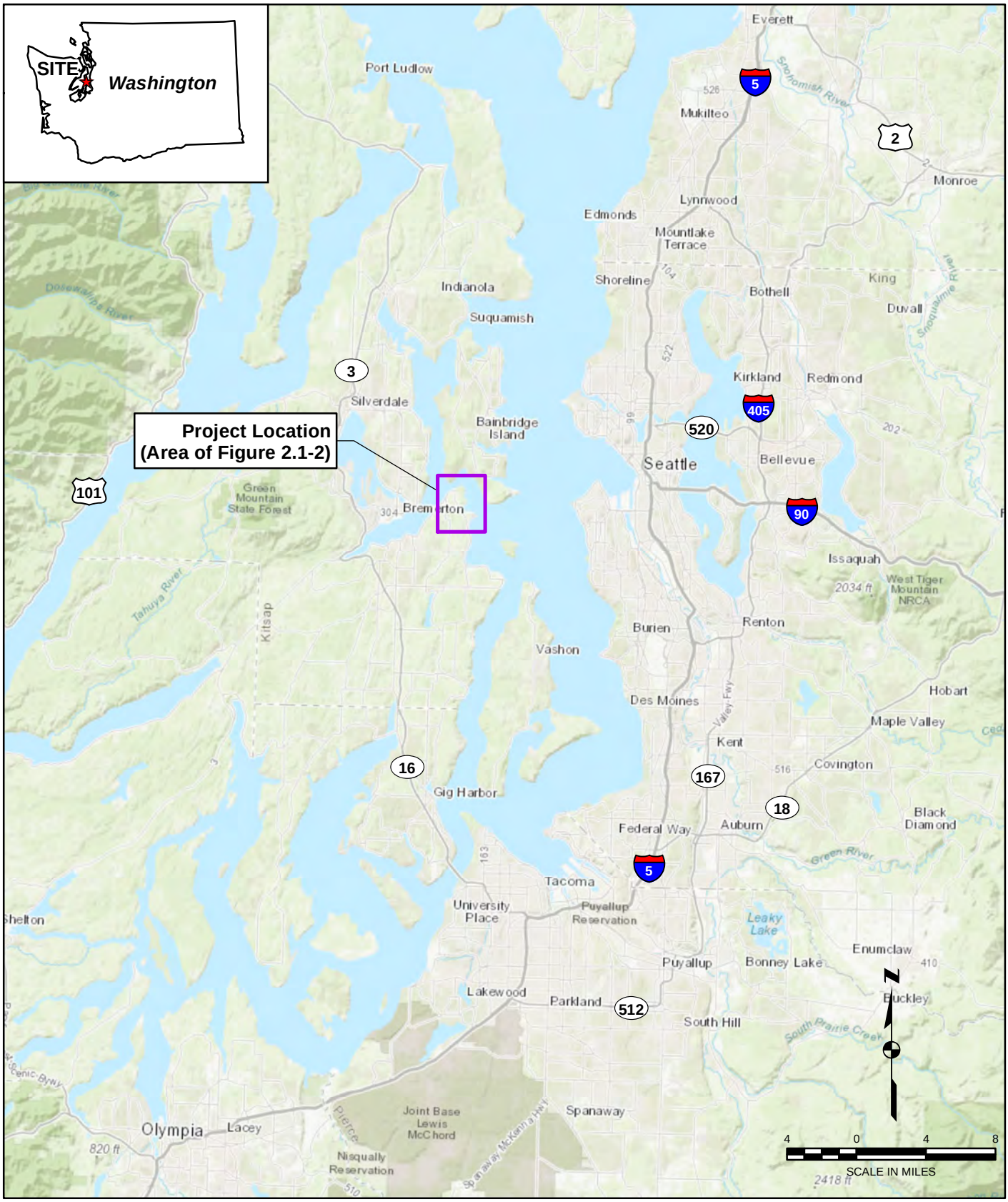
The Preferred Alternative would include the installation of seawater distribution pipelines throughout the upland areas of the site. The seawater distribution pipelines would connect the existing seawater intake facilities to a proposed new filter/UV system, an aeration head tank, and a distribution valve manifold; and would distribute treated seawater to existing laboratories and other buildings throughout the site. Most of the pipelines would be underground, except in the vicinity of the Filter/UV system, head tank, distribution valve manifold, and near Buildings 6 and 12. Below-grade pipelines would be constructed of high-density polyethylene material, whereas above-grade pipelines would be of Schedule 80 polyvinyl chloride. Table 2-1 describes the key components of the proposed replacement seawater system.

All proposed actions will be upland of the higher high water level (or 11 feet North American Vertical Datum of 1988 [NAVD88]). The finished grade elevation of the proposed facilities and pipeline routes range from 68 feet mean sea level (MSL) to 18 feet MSL. The existing seawater intake system in Clam Bay would not be altered by the Proposed Action – the new pipeline would tie into existing raw water intake pipelines at an upland location to the east of Building 13 at an elevation of approximately 17 feet MSL. No new outfalls would be constructed—discharge from the proposed replacement seawater circulation system would connect to the existing main seawater discharge outfall at a location upland from Clam Bay, specifically at an elevation of approximately 18 feet MSL (see Figure 2.1-4). All other existing outfalls would be capped or plugged and abandoned in place (with no ground disturbance).

The proposed augmentations or replacements to the seawater distribution system will not alter seawater intake quantities compared to existing conditions. The existing system pumps between 2,200 to 2,500 gallons per minute of seawater intake, 24 hours per day, 7 days per week. The existing pumps would be retained onsite and no increase in pumping capacity would occur as a result of the proposed action.

Similarly, the total water effluent volume would not change compared to existing conditions, but the location of the outflow would be consolidated into one existing outfall. The velocity of the main outfall is anticipated to increase slightly compared to existing, from approximately 4.9 to 5.6 feet per second, because all 2,500 gallons per minute of seawater outflow from the site would now discharge from this main outfall, rather than the current 2,200 gallons per minute.

The proposed Filter/UV System, Aeration Head Tank, and Distribution Valve Manifold would be supplied electricity from new electrical panelboards and stepdown transformers. This new infrastructure would connect with existing on-site electrical utilities near Building 22, via underground connections alongside the proposed pipeline corridor. The proposed facilities would also be connected to the existing diesel engine back-up generator in Building 9 which has sufficient capacity to handle additional load from these components (Burns McDonnell 2022). All UV filter equipment would be connected to an uninterruptible power supply capable of powering the equipment for 15 minutes until the standby generator comes online during an outage event. New pole/stanchion mounted LED lights would be installed to illuminate these three proposed facilities.



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

REGIONAL MAP

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NOVEMBER 2022
60680959

NOAA NWFSC MANCHESTER RESEARCH STATION
SEAWATER SYSTEM REPLACEMENT AND CAMPUS ADDITION PROJECT
MANCHESTER, WASHINGTON

FIGURE 2.1-1

K:\Puget_Sound\MXD\Regional Map.mxd

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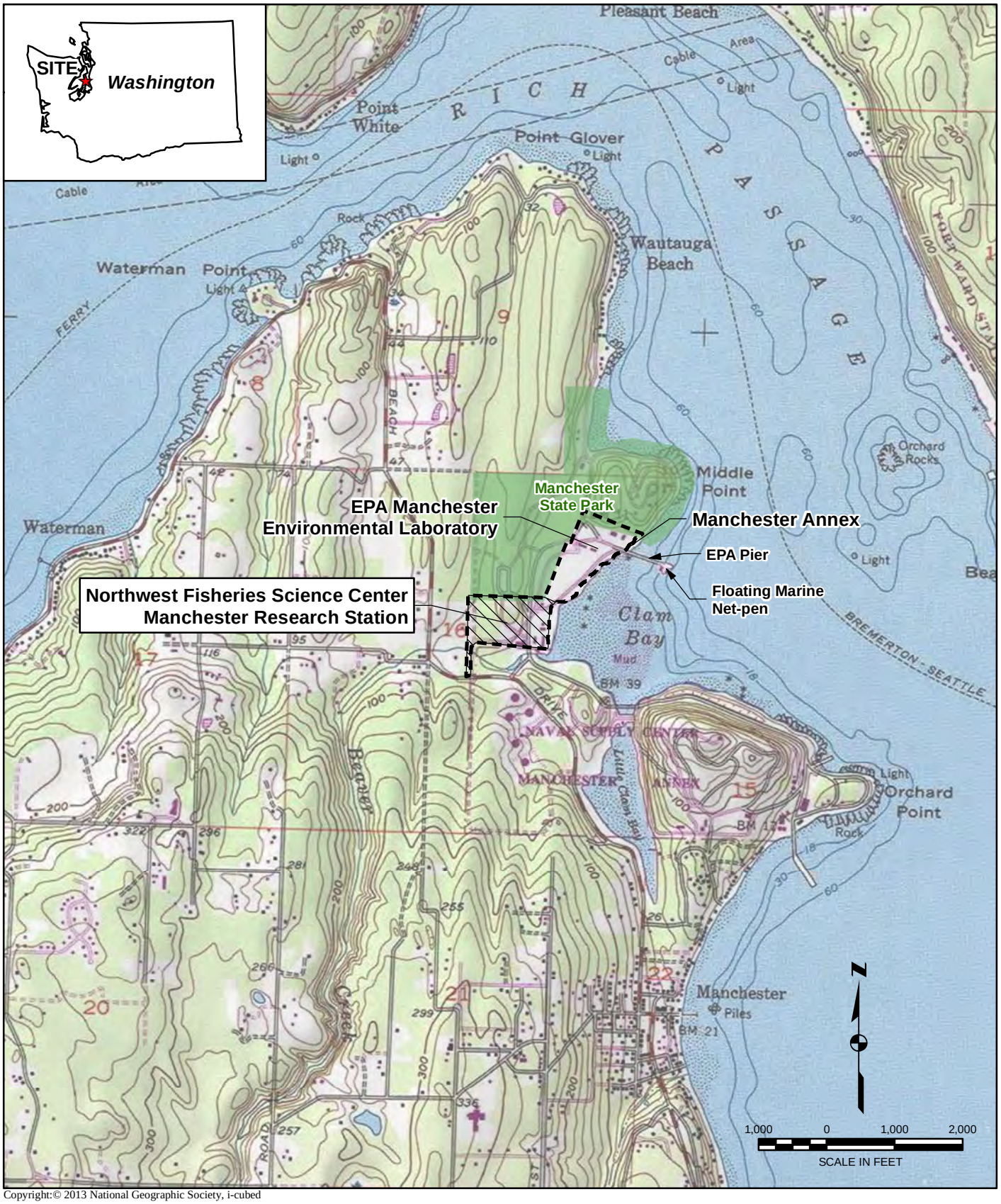

PROJECT AREA AND VICINITY MAP

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FEBRUARY 2023
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NOAA NWFSC MANCHESTER RESEARCH STATION
SEAWATER SYSTEM REPLACEMENT AND CAMPUS ADDITION PROJECT
MANCHESTER, WASHINGTON

FIGURE 1

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50 0 50 100

SCALE IN FEET

LEGEND

PROPERTY BOUNDARY

2' ELEVATION CONTOURS (NAVD88)

EXISTING BUILDINGS KEY

1 - MAIN BUILDING
2 - MAIN BUILDING
3 - MAIN BUILDING
4 - NAVY ANNEX I
5 - NAVY ANNEX II
6 - PATHOLOGY LAB
8 - WAREHOUSE
9 - EMERGENCY POWER GENERATOR
10 - CHEMICAL STORAGE CONTAINER
11 - FISH REARING
12 - SALTWATER MARINE LAB
13 - BPA
14 - FISH BEHAVIOR LAB
15A - OZONE GENERATOR
15B - OXYGEN GENERATOR
16 - ELECTRICAL SUPPORT STREAM CHANNEL
17 - SUPPORT FOR STREAM CHANNEL
18 - RECIRCULATION FOR B14
19 - MARINE FISH
21 - KENNETH CHEW CENTER
22 - NOOKSACK
23 - SALMON STREAM
24 - STORAGE & KELP LAB
25 - BEHAVIOR ECOLOGY - COVERED TANKS
26 - ALGAE GROWING BUILDING
27 - ALBALONE AND SEA CUCUMBER NURSERY
28 - TARP COVERED WORK AREA
29 - COVERED STORAGE
30 - QUONSET HUT PUMP HOUSE
31 - TEMPORARY OCEAN ACIDIFICATION FACILITY

DRAWING SOURCE: HDR.
IMAGERY SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY
CONTOURS FROM USGS NATIONAL ELEVATION DATASET, 2015.

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MANCHESTER RESEARCH STATION - EXISTING SITE FEATURES

NOAA NWFSC MANCHESTER RESEARCH STATION
FEBRUARY 2023 SEAWATER SYSTEM REPLACEMENT AND CAMPUS ADDITION PROJECT
60680959 MANCHESTER, WASHINGTON

FIGURE 2.1-3

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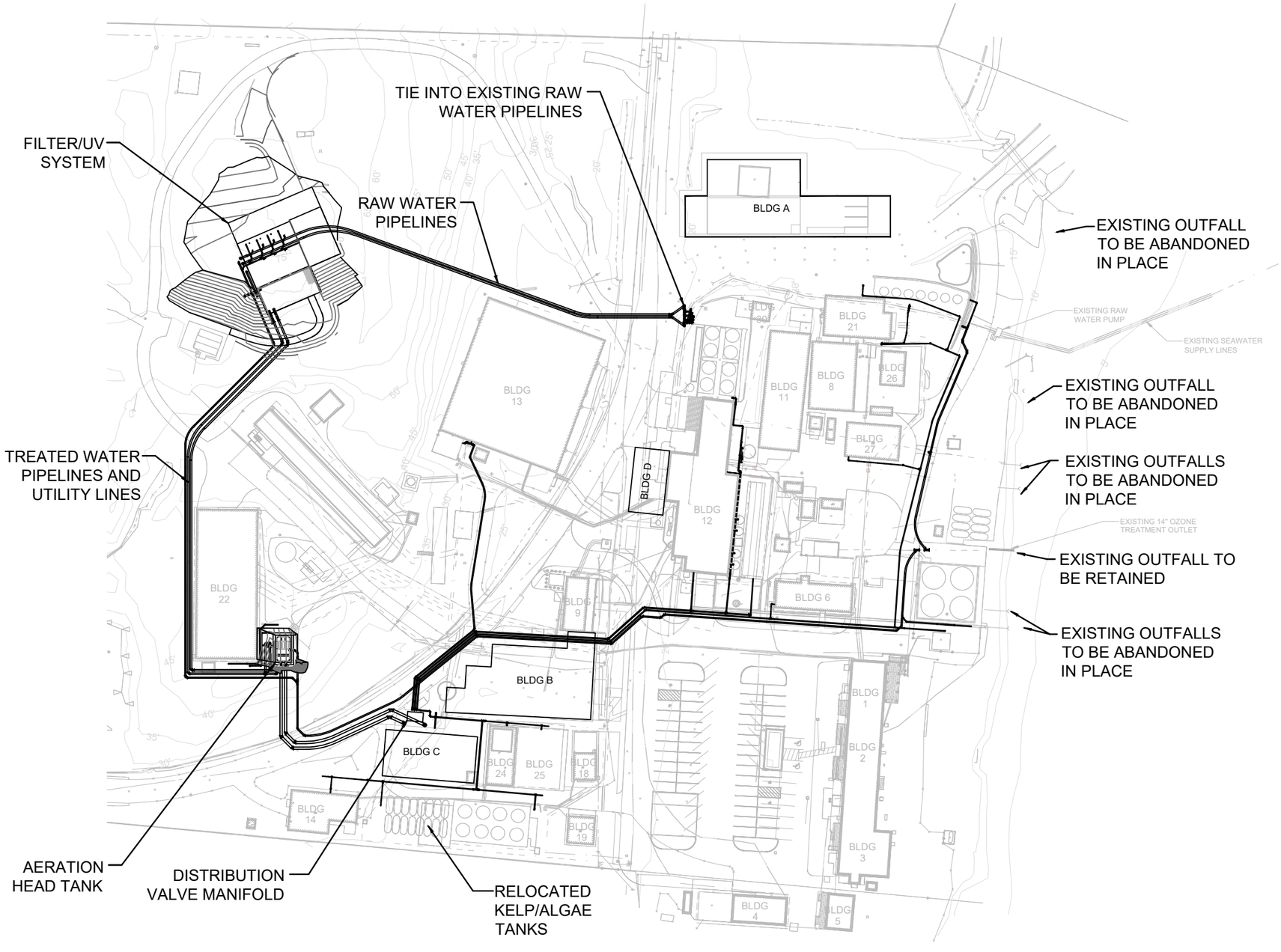

50 0 50 100
SCALE IN FEET

LEGEND
EXISTING SITE FEATURES
PROPOSED ACTION COMPONENTS

EXISTING BUILDINGS KEY
1 - MAIN BUILDING
2 - MAIN BUILDING
3 - MAIN BUILDING
4 - NAVY ANNEX I
5 - NAVY ANNEX II
6 - PATHOLOGY LAB
8 - WAREHOUSE
9 - EMERGENCY POWER GENERATOR
10 - CHEMICAL STORAGE CONTAINER
11 - FISH REARING
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27 - ALBALONE AND SEA CUCUMBER NURSERY
28 - TARP COVERED WORK AREA
29 - COVERED STORAGE
30 - QUONSET HUT PUMP HOUSE

ABBRE□IATIONS
RW - RAW SEAWATER
TW - TREATED WATER
TL - TL TRUNK LINE
OF - OVERFLOW
WD - WASTE DRAIN
CO - CLEANOUT
PL - PIPELINE
ø - DIAMETER

DRAWING SOURCE: HDR.
TIDAL DATUM SOURCE: NOAA BEACH SLOPE REFERENCE 2022.

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PREFERRED ALTERNATIVE SITE PLAN

NOAA NWFSC MANCHESTER RESEARCH STATION
FEBRUARY 2023 SEAWATER SYSTEM REPLACEMENT AND CAMPUS ADDITION PROJECT
60680959 MANCHESTER, WASHINGTON

FIGURE 2.1-4

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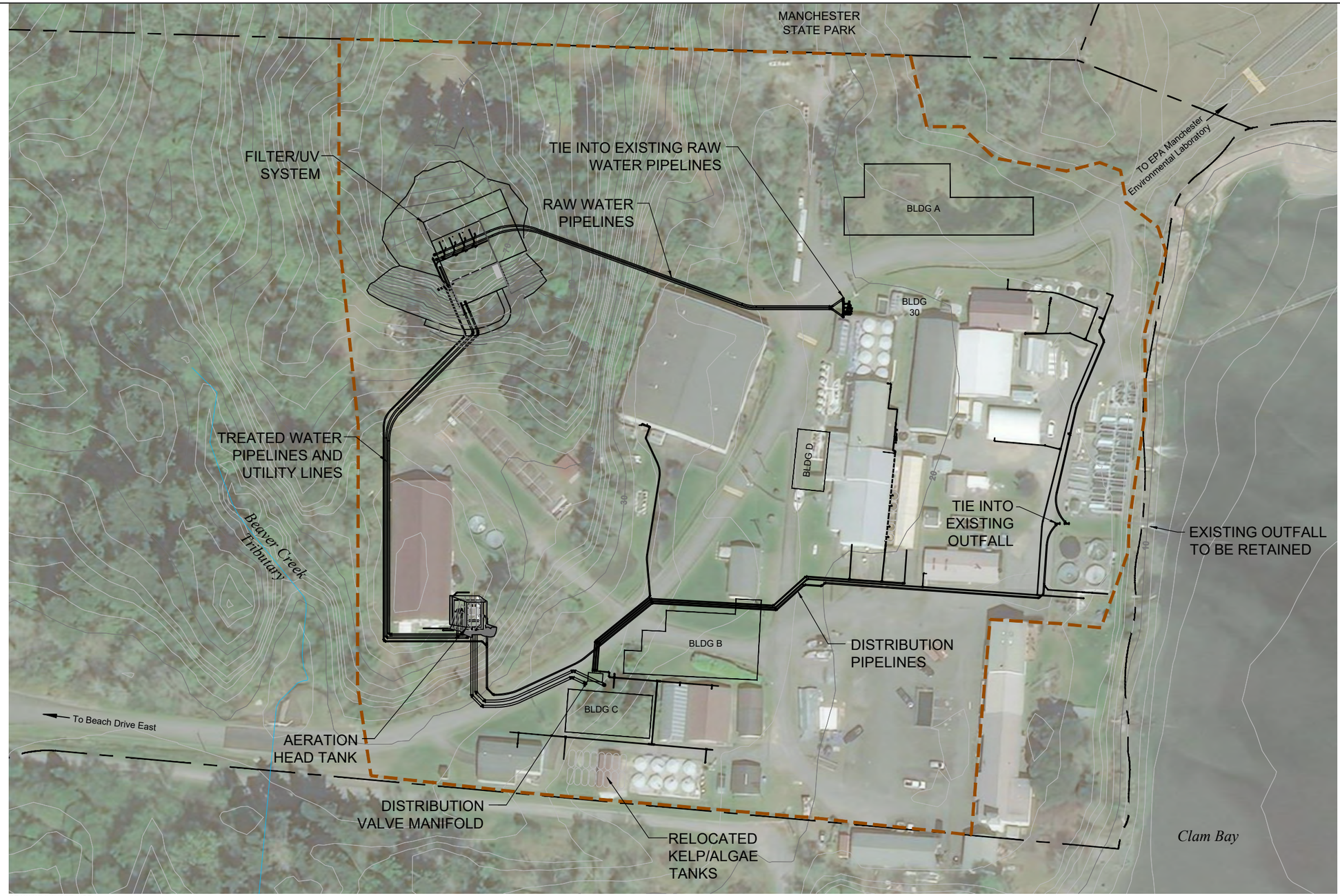

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CONTOURS FROM USGS NATIONAL ELEVATION DATASET, 2015.

PREFERRED ALTERNATIVE - MAXIMUM LIMITS OF DISTURBANCE (LOD)

NOAA NWFSC MANCHESTER RESEARCH STATION
FEBRUARY 2023 SEAWATER SYSTEM REPLACEMENT AND CAMPUS ADDITION PROJECT
60680959 MANCHESTER, WASHINGTON

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FIGURE 2.1-5

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Table 2-1 Proposed Seawater Treatment and Distribution System Components

Component	Location	Description
Raw water (RW) Pipelines	Originates at the existing seawater intake pipeline (~100 feet west of Building 30) then runs along the north of Building 13, then up the slope to connect to proposed Filter/UV System.	Two 16-inch diameter HDPE pipelines. Approximately 350 linear feet.
Filter/UV System	Approximately 150 feet west of Building 13	Approximately 50 x 68 feet two-tiered concrete pad with screens and filters on upper level (50 x 44 feet) and ultraviolet (UV) disinfection equipment on lower level (50 x 24 feet). A gravel pad would be constructed to the east (approximately 30 feet wide) and north (approximately 20 feet wide) of the concrete pad, to facilitate crane access to allow for filter swap-out and other maintenance activities. An approximately 15-foot-wide gravel driveway would provide access to the pad from the existing dirt road to the north. Aboveground components would extend up to approximately 5 feet above the pad.
Treated Water (TW) Pipelines	From south of Filter/UV System, along western and southern edges of Building 22 to connect with aeration head tank.	Two 16-inch diameter treated water (TW) HDPE pipelines. Approximately 425 linear feet.
Aeration Head Tank	Approximately 11 feet east of Building 22 (Nooksack Pole Building)	Approximately 24 x 14 feet concrete tank extending approximately 14 feet above grade, with aerators extending up to 6 feet above the tank. A 3.5-foot steel perimeter guard rail would be installed around the top of the tank. The existing gravel driveway would be extended to the northern and western sides of the tank, and a 3-foot-wide gravel pathway would be along the eastern and southern sides.
Treated Water (TW) Pipelines	Between Aeration Head Tank and Distribution Valve Manifold.	Two 24-inch diameter treated water pipelines. Approximately 175 linear feet.
Distribution Valve Manifold	To east of main driveway, approximately 80 feet west of Building 24.	Approximately 14 x 8 feet concrete pad with above-ground valves and meters extending up to approximately 5 feet above grade.
Trunk Line (TL) Pipelines	Main TL corridor heads north from Manifold along main driveway then turns to pass south of Building 9 and along northern edge of main parking lot then north along eastern (coastal) driveway. Branch lines connect to various existing and proposed buildings and structures.	Five HDPE pipelines of 8- or 10-inches diameter, with branch lines of 6-, 4-, or 3- inches for building connections. Approximately 2,500 linear feet.
Overflow (OF) Pipelines	Primary OF pipeline runs from Filter/UV pad along same path as main TW and TL corridor to connect with existing Main Ozone Treatment Outfall just north of existing halibut tanks. Secondary OF pipeline runs from just east of Building 26 (with connections from existing drains from several Buildings) along eastern (coastal) driveway to connect to existing Ozone Treatment Outlet.	HDPE pipelines of 12-inch diameter. Existing building and tank waste drains would tie into the new OF pipe. Primary OF is approximately 1,200 linear feet. Secondary OF is approximately 250 linear feet.

CAMPUS ADDITION

New Buildings

The Preferred Alternative would also include the construction of up to four new buildings on the site to accommodate expanded program requirements identified by NOAA as part of their Site Master Plan. The new buildings would provide laboratories, hatcheries, office space, and storage areas to serve the NWFSC's Environmental and Fisheries Science and Conservation Biology Divisions or both. Table 2-2 describes each of the proposed buildings. Detailed design for the buildings has not commenced, therefore this section conservatively describes the changes based on conceptual design and represents a "maximum envelope of development" for each component, such that the analysis within this EA will still be valid, even if the exact details, number of buildings, dimensions, layout and/or footprint of the proposed buildings change during the design process[1].

Table 2-2 Proposed Campus Addition Components

Component	Location	Description	Function
Building A – RAS hatcheries	To the north of the existing road in northeast of the MRS.	Approximately 9,000 SF single-story metal-framed building with concrete foundation. Approximately 150 x 60 feet, up to 25 feet maximum height.	Hatcheries, laboratories, storage, and office space serving the EFS Physiology and Feeds and Nutrition programs.
Building B – Laboratories and Offices	In area between Buildings 9 and Buildings 18, 24, and 25.	Approximately 6,000 SF single-story metal-framed building with concrete foundation. Approximately 120 x 50 feet, up to 25 feet maximum height.	Laboratories and office space serving both EFS and CB Divisions.
Building C – OA, Physiology, Ecotox hatcheries	Immediately east of Building 24	Approximately 3,000 SF single-story metal-framed building with concrete foundation. Approximately 75 x 40 feet, up to 25 feet maximum height.	Hatcheries and storage areas serving both EFS and CB Divisions.
Building D – Feed Development	Immediately east of Building 12	Approximately 1,500 SF single-story metal-framed building with concrete foundation. Approximately 30 x 50 feet, up to 25 feet maximum height.	Laboratories and storage areas for research and development into algae-based fish food pellets.

Acronyms: CB = Conservation Biology Division; Ecotox = Ecological Toxicity; EFS = Environmental and Fisheries Science Division; OA = Ocean Acidification; RAS = Recirculated Aquatic System; SF = square feet;

Many of the research activities that would be undertaken in the new buildings would be similar in nature to the existing research activities undertaken at the MRS. For example, the new research hatcheries in

[1] If detailed design changes such that the proposed components no longer fit within the "maximum envelope of development" described herein, additional analysis of environmental impacts under NEPA may be required.

Buildings A and C would be similar to existing activities undertaken in Buildings 6, 11, 12, 18 and 22, except that Building C would also support new research on ocean acidification and ecotoxicology to support programs moved from the former NOAA research station at Mukilteo. Ocean acidification research is currently undertaken in a temporary structure (Building 31) at the MRS. The new laboratories and office space in Buildings A and B would be similar to existing activities currently occurring in Buildings 1, 6, and 12. The new feed development laboratory in Building D would provide a larger, dedicated area for research and development of algae-based fish food pellets, which is currently undertaken at a smaller scale within Buildings 9 and 12.

The new buildings and related campus improvements included as part of the Preferred Alternative would not include built space to accommodate potential future relocation of other activities not listed above from the Montlake or Mukilteo Research Stations, NOAA Diving Center or OMAO Marine Operations Center - Pacific, as such future relocations have not been confirmed at this time. Any future relocation of these activities, if they were to occur, would require additional redevelopment at the MRS which would be a separate federal action subject to its own review under NEPA.

Operation of the Preferred Alternative would not result in any changes to the existing offshore facilities, e.g., the number, location, size, or use of the fish-pens.

Utilities and Services

The four proposed buildings would be connected to existing on-site services including electricity, potable water, sanitary sewer, and communications. The exact location of proposed utility connections for these buildings has not yet been determined; however, given their proximity to existing development within the site, it is anticipated that utility connections would be limited to previously disturbed areas of the site and would not require substantial vegetation clearance other than minor landscaping.

Parking, Site Circulation and Landscaping

To accommodate the proposed new buildings, changes to the internal site circulation and parking areas would be required. Detailed design for these site changes has not yet been developed, however preliminary planning has indicated that the following changes would be required:

- The two existing driveway connections between the main roadway and northeast corner of the main parking lot would be removed and a new entrance-only driveway would be constructed to the north of Building 9.
- The existing no-exit driveway between Buildings 18 and 19 would be extended as an exit-only connection from the main parking lot to the main roadway.
- Additional building accesses/driveways from the main roadway would be provided to serve proposed Buildings B and C, existing Building 9, proposed Building D, and proposed Building A.
- Three additional parking spaces would be provided, near Building A.

A conceptual layout for these changes is shown in Figure 2.1-6, which is subject to change during design.

Figure 2.1-6 Conceptual Site Circulation Layout

Adapted from Iron Horse Architects 2022.

2.1.3 Operation and Maintenance

SEAWATER TREATMENT AND DISTRIBUTION SYSTEM

Expansion of existing facilities or property use is not proposed. It is assumed that proposed revisions or replacements to the seawater distribution system will not alter seawater intake velocities and volumes and water effluent quality and volumes currently operating consistent with existing permit limitations.

The Preferred Alternative would result in all seawater from the system discharging from the main (ozone treatment) seawater outfall, with the other outfalls being abandoned in place. The main seawater outfall currently discharges approximately 88 percent of seawater from the system (2,200 gallons per minute), which would increase to 100 percent (2,500 gallons per minute) once the new distribution system is operational. The velocity of discharge from the main outfall may increase slightly compared to existing conditions, from approximately 4.9 feet per second to approximately 5.6 feet per second, due to the increased volume. The new seawater treatment and distribution system would not require any additional staffing, deliveries, or other changes to site operations.

Typical maintenance activities for the new system would include:

- Supply Piping and piping between the Filter/UV structure and the Head tank will be flushed and the active piping changed per the current flushing schedule.
- Check and clean debris from debris screen daily.
- Every two weeks run a hot water backwash of the filters.

- Every two weeks check filter backwash nozzles and screens and replace or clean defective components.
- Every two weeks clean the backwash strainers.
- Every two months remove the filter screens and replace with clean screens. The dirty screens will be left to dry to kill biological growth and then pressure washed to ready them for the next cleaning cycle.
- Twice a year remove the active aerators and replace with clean aerators. Dirty aerators will be left to dry to kill biological growth and then pressure washed to ready them for the next cleaning cycle.
- Twice a year remove drums from the filters and clean accumulated biological growth from inside the filter tanks.
- Normal equipment maintenance as recommended by the equipment supplier.

CAMPUS ADDITION

The proposed site improvements would allow an increase of approximately 6 additional permanent staff at the MRS, as well as up to ten additional temporary (daily or weekly) visitors on an occasional basis. Deliveries to the site would increase slightly, relative to the size of the new facilities, but the types of deliveries are not anticipated to change substantially.

2.1.4 Site Preparation and Construction Activities

Construction of the Preferred Alternative would occur in phases, with the replacement seawater treatment and distribution system being installed during the first year of construction, and proposed buildings and associated hardscaping and landscaping changes occurring in the second year. Construction staging is anticipated to be confined to the immediate vicinity of the component footprints and other previously disturbed areas of the site (e.g., the main parking lot) to the extent feasible and are not anticipated to require substantial additional vegetation clearance beyond that required for construction.

PHASE 1 – SEAWATER TREATMENT AND DISTRIBUTION SYSTEM

Construction of the replacement seawater treatment and distribution system is anticipated to begin in approximately August 2023 and would last approximately 12 months. Construction activities would typically occur between 7 a.m. and 7 p.m., Monday through Friday, although occasional weekend work or early start/late finishes may be required. Anticipated construction equipment for this phase would include crane, backhoes, grader, dozer, vibratory or sheepsfoot roller, concrete trucks, concrete pumps, and tree-removal equipment.

The temporary Ocean Acidification facility (Building 31 on Figure 2.1-3) that is currently east of Building 22 would be removed to make space for the proposed Aeration Head Tank. Grading would be required in the vicinity of the Filter/UV System, Aeration Head Tank, and Distribution Valve Manifold, including construction of retaining walls up to 10 feet in height near the Filter/UV System. Trenching would be required for pipeline installation. The estimated net impervious surface area and area of temporary disturbance for each component, based on conservative assumptions, are shown in Table 2-3.

Table 2-3 Estimated Impervious Surfaces and Temporary Disturbance Areas – Phase 1

Component	Net Impervious Surface Area[1] (permanent)	Approximate Temporary Disturbance Area	Approximate Area of Vegetation Removal[4]	Approximate Maximum Depth of Excavation
Filter/UV System	8,500 SF	20,000 SF	20,000 SF	13 feet below existing grade
Aeration Head Tank	950 SF	1,500 SF	negligible	6 feet below existing grade
Distribution Valve Manifold	150 SF	500 SF	negligible	6 feet below existing grade
Raw Water & Treated Water Pipeline Trenching	negligible	12,000 SF[2]	5,000 SF[5]	6 feet below existing grade
Trunk Line and OF Pipeline Trenching	negligible	12,000 SF[3]	negligible	2 feet below existing grade
TOTAL (Phase 1)	**9,600 SF**	**48,000 SF**	**25,000 SF**	**N/A**

LF = linear feet; OF = overflow; SF = square feet; UV = ultraviolet; N/A = not applicable
1. Includes proposed concrete and gravel surfaces.
2. Assumes 10 feet disturbance width along approximately 1,200 LF between raw-water tie-in and distribution manifold.
3. Assumes average 6 feet disturbance width along approximately 1,200 LF of main trunkline/overflow pipeline route, and average 3 feet disturbance width along approximately 1,500 LF of single trunk lines and building/tank connections.
4. Does not include previously disturbed landscaped areas (e.g., mowed grass and planted trees/shrubs).
5. Assumes average 10 feet vegetation clearance along approximately 500 LF of raw water and treated water pipeline routes passing through previously undisturbed vegetation.

In general, the pipeline routes have been designed to avoid the need for vegetation removal where possible (e.g., by following the previously disturbed areas adjacent to Buildings 13 and 22, however up to approximately 400 linear feet of vegetation removal (not counting previously-disturbed, grassed areas) would be required in the western part of the site (between Building 13 and the Filter/UV System, and between the Filter/UV System and Building 22) to facilitate trenching. Assuming a disturbance corridor of approximately 10 feet, this equates to approximately 5,000 square feet of vegetation clearance for pipeline trenching. Some tree trimming may also be required for construction equipment access along the existing dirt road from Building 13 to the Filter/UV System.

The maximum depth of pipeline trenching would be up to 6 feet below ground surface for the largest pipelines (24-inch diameter). The width of trenching would vary depending on the number and size of pipelines to be installed within the same trench but is not expected to exceed 5 feet. Trenches would be backfilled with imported gravel and suitable stockpiled on-site excavated soils. Smaller pipelines would require shallower/narrower trenching – for example, a single 4- to 10-inch trunk line would typically require a trenching width of approximately 16- to 22-inches and a depth of 24 inches.

An estimated 1,800 cubic yards (CY) of cut and 600 CY of fill would be required for the Filter/UV System, Head Tank, and Distribution Valve manifold, based on 90 percent design (Entitlement and Engineering Solutions, 2022). For pipeline trenching within unpaved areas (e.g., raw water and treated water pipelines between the existing system tie-in and manifold) most of the excavated soil is anticipated to be reused to backfill the trench and/or would be spread in the immediate vicinity of the trench so that

no excess spoils are generated. For pipeline trenching within paved areas (e.g., trunk lines and overflow pipeline downstream of the manifold), there would be limited potential for reuse of excavated soils, and it is anticipated that up to 1,500 CY yards of excess spoils could be generated from these areas. Approximately 600 CY of construction-grade fill may also need to be imported for backfilling the trenches if excavated materials are not suitable for re-use. For the purposes of environmental analysis within this EA, to allow flexibility during final design, it is conservatively assumed that Phase 1 construction may generate up to twice these estimated volumes, i.e., up to 6,600 CY of excess spoils and up to 2,400 CY of imported fill.

Upon completion of construction activities, disturbed areas would be repaved or hydroseeded, as appropriate. In previously paved areas of the site, the amount of saw cutting and pavement removal needed for pipe installation would be minimized, and the pavement would be repaired to match the existing surface.

The existing treatment and distribution system would be operational throughout construction to ensure a continued supply of seawater to meet facility needs. Once the new treatment and distribution system is operational, the obsolete components of the existing seawater treatment and distribution system would be disconnected. Underground components and existing beach outfalls would be abandoned in-place, while sand filters and other aboveground components to the east of Building 12 would be removed and disposed of.

PHASE 2 – CAMPUS ADDITION

Construction of the new buildings would not commence until after the new seawater treatment system has been completed, in approximately August 2024 and is anticipated to take approximately 12 months. Construction activities would typically occur between 7 a.m. and 7 p.m., Monday through Friday, although occasional weekend work or early start/late finishes may be required.

Anticipated construction equipment for this phase would include crane, backhoes, grader, dozer, vibratory or sheepsfoot roller, concrete trucks, concrete pumps, and tree-removal equipment.

The removal or relocation of some existing structures will be necessary prior to construction of new buildings at the site, including:

- Relocation of existing covered storage from current location east of Building 14 to new location west of Building 19, to accommodate relocation of kelp/algae tanks (see next bullet, and Figure 2.1-6). This would require a new approximately 800 square feet (SF) concrete foundation.
- Relocation of 16 existing kelp/algae tanks from current location near shoreline to new location on existing covered storage foundation (see previous bullet, and Figure 2.1-6). Existing foundation would be expanded by approximately 1,000 SF. Eight of the tanks would remain in their current location.
- Removal of existing seawater treatment and distribution system components currently to east of Building 12 to facilitate construction of Building D.

In addition to the buildings and structures that would be relocated or removed to facilitate construction, removal of landscaping and hardscaping would be required within building footprints and utilities may need to be rerouted. Approximately 0.26 acres of vegetation would be removed to accommodate Building A. None of the features to be removed are of an age where hazardous building materials such as lead-based paint or asbestos would be a concern. The estimated net impervious surface area and area of temporary disturbance for each component, based on conservative estimates, are provided in Table 2-4, below.

Table 2-4 Estimated Impervious Surfaces and Temporary Disturbance Areas – Phase 2

Component	New Impervious Surfaces[1]	Approximate Temporary Disturbance Area[2]	Approximate Area of Vegetation Removal[3]
Building A	9,000 SF	11,250 SF	11,250 SF
Building B	6,000 SF	7,500 SF	negligible
Building C	3,000 SF	3,750 SF	negligible
Building D	1,500 SF	1,875 SF	negligible
Site Improvements	14,000 SF	15,400 SF	negligible
New Covered Storage Pad	800 SF	1,000 SF	negligible
Kelp Tank Pad Expansion	1,000 SF	1,250 SF	negligible
TOTAL (Phase 2)	**35,300 SF**	**42,025 SF**	**11,025 SF**

SF = square feet
[1] Does not account for existing impervious surfaces within proposed footprints.
[2] Assumes 25 percent increase beyond building foundations and 10 percent increase for new paved areas.
[3] Does not include previously disturbed landscaped areas (e.g., mowed grass and planted trees/shrubs).

The proposed buildings would be single-story, metal-frame construction with concrete foundations. The exact type and depth of foundation would be determined during design based on site-specific geotechnical conditions but based on recent building construction projects at the site, may require drilled concrete piles to a depth of approximately 9 feet. Based on conservative assumptions regarding average excavation depths (3 feet average depth for building foundations and 2 feet average depth for other site improvements) the total estimated cut volume would be approximately 3,700 CY.

2.2 NO-ACTION ALTERNATIVE

The No-Action Alternative for the Proposed Action would be to leave the existing facilities and seawater treatment and distribution system in place and continue site operations as currently undertaken. There would be no substantial new research undertaken at the site, no new buildings constructed. Under the No-Action Alternative, the existing seawater treatment and distribution system is anticipated to eventually fail, which would require NOAA to cease all seawater-based research at the research station.

2.3 ACTION ALTERNATIVE 1 – SEAWATER SYSTEM ONLY

Under Action Alternative 1, the proposed replacement seawater treatment and distribution system would be installed at the site, exactly as described for the Preferred Alternative. However, no new buildings would be constructed, and no changes to the on-site roadways or landscaping would occur.

2.4 ALTERNATIVES CONSIDERED AND REJECTED

The proposed seawater treatment and distribution system is intended to replace and upgrade the existing seawater system serving existing research activities at the MRS. Therefore, any consideration of an alternative site for the seawater treatment and distribution system would also require relocation of all the existing research facilities from the existing site to a new site, which would be substantially more expensive, time consuming, and disruptive to NWFSC's mission.

None of the other NWFSC laboratories in the Puget Sound area have existing seawater systems that could accommodate the relocation of existing Manchester research facilities or anticipated future research needs. The Manchester site already contains substantial research facilities and an existing seawater intake and outfalls. Any alternative locations would need to be constructed from scratch, which would substantially increase associated costs, schedule, and disruption to existing research undertakings.

Different types of filtration and aeration equipment were considered during design of the seawater treatment and distribution system. The UV system utilizes equipment that NOAA already owns so no alternatives were evaluated for this equipment. Other filtration systems were rejected because of one or more of the following:

- Lack of operational experience with the relatively new equipment technology compared with the filters selected.
- The filtration equipment would have required too much backwash water to make operations feasible.
- The costs were too high.

Other aeration systems were rejected because they would have required more maintenance than the equipment selected and would have cost more.

Multiple site layout options and component siting arrangements were also considered and refined during design of the seawater treatment and distribution system, to meet various design criteria including constructability, operational requirements, cost, avoidance of potential wetland features and areas with known contamination, and to minimize the amount of vegetation clearance and/or grading to the extent feasible. The Preferred Alternative represents the culmination of this design process.

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3 EXISTING ENVIRONMENT

The NOAA property supporting the NWFSC MRS is approximately 22 acres, with the existing MRS facilities concentrated on the relatively flat eastern section of the NOAA property. This area ranges in elevation from approximately 13 to 18 feet NAVD88. To the west and north of the developed portion of the site are forested slopes ranging in elevation from approximately 20 to 68 feet NAVD88.

The NOAA property is bordered by the Manchester State Park to the north, EPA's Manchester Environmental Laboratory to the northeast, Clam Bay to the east, the U.S. Navy's Manchester Fuel Depot to the south, and rural residential-uses to the west.

Existing facilities at the site are shown on Figure 2.1-3 and include:

- Office space (Building 1,2,3, 4 and 5 on Figure 2.1-3).
- Land-based tank rearing space (Building 11 on Figure 2.1-3).
- A freshwater experimental stream for salmon studies (Building 23 on Figure 2.1-3).
- A fish behavior laboratory (Building 14 on Figure 2.1-3).
- Kenneth K. Chew Center for shellfish research and restoration (Building 21 on Figure 2.1-3).
- Analytical laboratories (Buildings 6, 12, and 19 on Figure 2.1-3).
- Macro- and microalgae culture facilities (Buildings 24 and 26 on Figure 2.1-3).
- Seawater supply intake, pump, and pipelines that supply up to 2,500 gallons per minute of filtered and UV treated seawater to facilities within the site.
- Seven seawater outfalls that discharge into the Clam Bay intertidal area.

In addition to the facilities listed above, MRS operates an 8,230-SF (88.5 feet by 93 feet) floating marine net-pen complex for testing pilot-scale commercial aquaculture and understanding the impacts of commercial rearing activities. The net-pens are located at the end of the EPA pier, approximately 1,600 feet northeast (offshore) from the northeast corner of the NOAA property (Figure 2.1-2). No changes are proposed to the net-pen complex as part of the proposed action.

The northeast corner and eastern (coastal) edge of the NOAA property are within a 100-year floodplain. To the west of Building 13, there is a moderate erosion hazard area and a moderate landslide hazard area. There is a potential wetland in the southwestern portion of the parcel near the site entrance (Kitsap County 2022). An additional wetland feature was identified to the east of the main access road, just west of Building 22.

South of the MRS on adjacent property, Beaver Creek flows east-west and discharges into the estuarine habitats in Clam Bay. An unnamed tributary flows approximately north-south in the undeveloped western portion of the NOAA property. Both Beaver Creek and the unnamed tributary are fish-bearing streams.

More details on existing conditions at the site are provided for each resource topic in Section 4.0, *Affected Resources and Environmental Consequences*.

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4 AFFECTED RESOURCES AND ENVIRONMENTAL CONSEQUENCES

This section describes the affected resources and anticipated environmental consequences from implementation of the Preferred Alternative, Action Alternative 1, and the No-Action Alternative, including mitigation measures that would avoid, reduce, or minimize any potentially significant adverse effects of the Proposed Action.

The Council on Environmental Quality's NEPA regulations require federal agencies to evaluate three types of effects in environmental reviews: (i) direct effects, which are "caused by the action and occur at the same time and place;" (ii) indirect effects, which are "caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable;" and (iii) cumulative effects, which result from "the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions". Indirect effects should be considered as part of direct effects for all projects. As used in NEPA, the term "significant," requires considerations of both *context* and *intensity* as defined below:

Context means that the significance of an action must be analyzed in several contexts such as society as a whole (human, national), the affected region, interests, and the locality. Significance varies with the setting of the Proposed Action. For instance, in the case of a site-specific action, significance would usually depend on the effects in the locale rather than in the world as a whole. Both short- and long-term effects are relevant.

Intensity refers to the severity of impact. Responsible federal officials must bear in mind that more than one agency may make decisions about partial aspects of a major action. The following should be considered in evaluating intensity:

- Impacts that may be both beneficial and adverse. A significant effect may exist even if the federal agency believes that on balance the effect will be beneficial.
- The degree to which the Proposed Action affects public health or safety.
- Unique characteristics of the geographic area such as proximity to historic or cultural resources, parklands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
- The degree to which the effects on the quality of the human environment are likely to be highly controversial.
- The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.
- The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.
- Whether the action is related to other actions with individually insignificant, but cumulatively significant, impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.

- The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places (NRHP) or may cause loss or destruction of significant scientific, cultural, or historical resources.
- The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.
- Whether the action threatens a violation of federal, state, or local law or requirements imposed for the protection of the environment.

For this analysis, the intensity of an impact is assessed in terms of change or degree of change in a resource condition. Common characterizations used include the degree of change from existing conditions or effects to managed or scarce resources, often expressed as the relative area of impact, measured units of change, differences in levels of use, etc. Terminology used for depicting the overall magnitude of impact include:

- No Effect—The Proposed Action would not cause a detectable change.
- Negligible—The impact would be at the lowest level of detection; the impact would not be significant.
- Minor—The impact would be slight but detectable; the impact would not be significant.
- Moderate—The impact would be readily apparent; the impact would not be significant.
- Major—The impact would be clearly adverse or beneficial; the impact has the potential to be significant.

These levels of potential effect can consider duration, geographic extent, and the potential likelihood to occur, as indicated below:

- Duration—How long the impact would be expected to occur or last, measured in length of time. Common characterizations are short-term, long-term, permanent, etc.
- Geographic extent—Where the impact would be expected to occur geographically in the project area. Common characterizations for this Proposed Action are largely local or regional in nature.
- Potential to occur (likelihood)—How probable the impact would be. Common characterizations include the likelihood of the impact if the project were to be permitted, or probability of occurrence based on the results of analysis. Common characterizations are unlikely, possible, probable, or certain to occur.

4.1 LAND USE

This section describes the current land use at and near the NOAA property and evaluates whether the Proposed Action would conflict with existing land-use, zoning, or other special use designations. The description of existing setting and evaluation of the impacts is based on review of published information from affected federal, state, and local governments. Land use designations and land management decisions are guided by state law and local comprehensive plans which specify the allowable types and locations of present and future land use. Designations for land use are typically made by the local jurisdiction through management plans and associated policies, ordinances, and regulations, unless the property is owned by a state or federal agency.

4.1.1 Regulatory Setting

FEDERAL

Public Buildings Amendments

The Public Buildings Amendments of 1988, 40 U.S. Code (USC) 3312 requires a federal agency to comply with a nationally recognized model building codes and consideration of state and local zoning laws. Applicable national standard codes, such as electrical, life safety, and plumbing codes are required to be implemented when constructing structures or altering any federal property. The Public Buildings Amendments also stipulate that federal agencies consider state or local zoning, consult with appropriate officials, and make plans available upon request. State and local government may make recommendations and the federal agency should give due consideration to those recommendations and local conditions. However, no action, fine or penalty may be brought against the Federal Government for failure to meet the requirements of this Public Law, or for failure to carry out any State or local government recommendation.

STATE

Article XVII State of Washington Constitution

At Statehood in 1889, Article XVII of the state of Washington's constitution gave the state ownership of the "beds and shores of all navigable waters in the state." These state-owned submerged and aquatic lands are managed by the Washington State Division of Natural Resources (DNR) Aquatic Resources Division, who issues aquatic land leases with which funds are reinvested to restore aquatic ecosystems, protect the health and productivity of aquatic resources, and fund local projects that create public access to aquatic lands and the state's aquatic reserves.

Washington State Growth Management Act.

Washington State’s Growth Management Act (Revised Code of Washington [RCW] 36.70A) of 1990 requires state and local governments to manage statewide growth by identifying urban growth areas and preparing comprehensive plans, capital improvement programs, and development regulations. The Growth Management Act requires infrastructure (transportation, water, sewer, and other urban services)

to achieve population and employment targets established by the regional and local comprehensive plans. The Growth Management Act also specifies that transportation projects be identified and constructed concurrent with future development projects.

Coastal Zone Management Program

The Washington State Department of Ecology (Ecology) administers Washington's Coastal Zone Management Program, which applies to all lands and waters in Washington's coastal counties, including Kitsap County where the project is located. The coastal zone extends seaward from the shoreline three nautical miles. As a federal action, the proposed project is subject to the federal consistency provision of the Coastal Zone Management Act and the state's Coastal Zone Management Program, as discussed in Section 4.11, Coastal Zone Management.

Washington State Shoreline Management Act

The state of Washington Shoreline Management Act was passed by the Washington Legislature in 1971 and adopted by voters in 1972. Its overarching goal is "to prevent the inherent harm in an uncoordinated and piecemeal development of the state's shorelines." There are three basic policy areas: shoreline use, environmental protection, and public access. The Shoreline Management Act requires all counties and most towns and cities with shorelines to develop and implement Shoreline Master Programs. The law also defines Ecology's role in reviewing and approving local programs. Kitsap County has a state-approved Shoreline Master Program (SMP).

LOCAL

Puget Sound Regional Council VISION 2050

VISION 2050 is a long-range growth management strategy for the Puget Sound region (King, Kitsap, Pierce, and Snohomish counties) (Puget Sound Regional Council 2020). The policies described in VISION 2050 are carried forward in the comprehensive plans and policies of Kitsap County.

Kitsap County Comprehensive Plan 2016-2036

The Kitsap County Comprehensive Plan was adopted in June 2016 and amended through April 2020 (Kitsap County 2020a). The plan provides goals and policies to guide growth and development in the unincorporated areas of Kitsap County, as required by the Washington State Growth Management Act (RCW 36.70). The first Washington State Growth Management Act--compliant comprehensive plan for Kitsap County was adopted in February 1999. The comprehensive plan has a 20-year planning horizon, but is updated every 10 years. In-between updates, the County can adopt amendments.

Kitsap County Shoreline Master Program

The Shoreline Management Act is a state-mandated cooperative program of shoreline planning with local government and state responsibilities (RCW 98.58.050). Under the Shoreline Management Act, Kitsap County adopted an SMP in 1976. An SMP is a set of policies and regulations that encourage reasonable and appropriate development of shorelines, protect the natural resources and character of the shoreline,

and promote public access (Kitsap County 2020b). The SMP applies to shorelines of the state (shorelines), which are waterbodies that meet the size of flow criteria in the Shoreline Management Act. The extent of the shoreline is 200 feet from the ordinary high water line or high tide line and includes associated wetlands, floodways, and up to 200 feet of floodplain.

The SMP must undergo a review every 8 years, as required by state law (RCW 90.58.080). The most recent review took place in 2021, and the amended SMP took effect on October 7, 2021, along with Title 22 (Shoreline Master Program) of the Kitsap County Code (KCC) and amendments to Title 19 (Critical Areas Ordinance) and Title 21 (Land Use and Development Procedures) of the KCC.

Development within the SMP jurisdiction generally must comply with the requirements of the SMP and KCC Title 22. However, under KCC 22.100.120 Section B(6), projects on shorelines under exclusive federal jurisdiction are not required to obtain shoreline permits or local reviews, though KCC 22.100.120(C) states that federal agency activities affecting the uses or resources subject to the Shoreline Management Act must be consistent to the extent practicable with the enforceable provisions of the Shoreline Management Act and the County's SMP. See the Coastal Zone Management section for a detailed description of the applicability and requirements of the local SMP.

Kitsap County Critical Areas Ordinance

Under Kitsap County Critical Areas Regulations, Chapter 19.100, critical areas review is typically required to conduct work in critical areas and their buffers within unincorporated Kitsap County. Critical areas include: wetlands, fish and wildlife habitat conservation areas, geologically hazardous areas, frequently flooded areas, and critical aquifer recharge areas. As with all local permit processes, NOAA as a federal agency would comply with Kitsap County's critical areas regulations to the maximum extent practicable, as defined under the Public Buildings Amendments of 1988.

4.1.2 Affected Environment

The MRS is located on parcel number 162402-1-001-2005 in unincorporated Kitsap County, approximately one mile north of Manchester, Washington, and directly south of Manchester State Park (the park). Kitsap County is one of fifteen coastal counties within Washington and subject to the State and County Coastal Zone Management Programs. The MRS is a part of the 31-acre Manchester Annex and located in a rural industrial complex on the western shore of Clam Bay. The northern portion of the Annex is currently occupied by EPA's Manchester Environmental Laboratory. The property itself is zoned as "Military," but is bordered by the park to the north, Rural Residential-zoned parcels to the west, and additional Military-zoned land to the south (a Department of Defense fuel tank farm).

The parcel is not within an Urban Growth Boundary, as defined by the Washington State Growth Management Act. It is also not within a subarea or subject to a neighborhood plan under the Kitsap County Comprehensive Plan. Uses on Military-zoned land are not defined in the Kitsap County Code Title 17 (Zoning). However, the purpose of the Rural Residential zone that lies to the west of the property is to promote low-density residential development and agricultural activities. The maximum density for these parcels is one dwelling unit per 5 acres. The park to the north of the property does not allow

dwelling units and is not intended to accommodate population growth. Land zoned as a Park is intended for the development of parks, open spaces, and recreational facilities for the benefit of the citizens of Kitsap County.

Portions of the property contain some critical areas, as defined by the Critical Areas Ordinance contained in KCC 19.100. Portions of the existing access road in the northeastern corner of the parcel, and a narrow area along the coastline are within a 100-year floodplain (see Section 4.10, Floodplains). To the west of Building 13, there is a moderate erosion hazard area and a moderate landslide hazard area (see Section 4.2, Geological Resources). A potential wetland is identified in the southwestern portion of the NOAA property (near the site entrance from Beach Drive East) that is outside of the LOD (Kitsap County 2022).

4.1.3 Environmental Consequences

PREFERRED ALTERNATIVE

There would be no substantial change to land use at the site of the Preferred Alternative. Land use in the surrounding area is rural residential, military, and park and would not be altered as a result of the proposed development of the Preferred Alternative. All proposed development associated with the Preferred Alternative would be located within the boundaries of the existing NOAA MRS so it would be a compatible land use. Other facilities currently existing at the MRS are used for similar purposes. The new seawater treatment and distribution system would replace the existing system to allow continued operations at the site and the four new buildings would support future research operations, which would be of a similar nature to existing research undertaken at the site.

Most of the proposed development for the Preferred Alternative would be outside of the potential SMP boundary. However, some portions of the underground piping, and the tie-in to the existing main outfall would be within 200 feet of the ordinary high water line. The Coastal Zone Management section discusses the consistency with the SMP for these portions of the Preferred Alternative.

There would be ***no adverse impact*** to land use from Preferred Alternative.

NO-ACTION ALTERNATIVE

Under the No-Action Alternative, the existing facilities and seawater treatment and distribution system would be left in place and the MRS would continue site operations as currently undertaken for as long as feasible. The existing seawater treatment and distribution system is anticipated to eventually fail, which would require NOAA to cease all seawater-dependent research activities at the station. There would be no impacts to land use in the short-term, as there would be no new structures and no change in use. In the long-term, future land use at the site could change due to cessation of research activities; however, the environmental effects of such a future change cannot be determined without speculation.

ACTION ALTERNATIVE 1

The impacts to land use under Action Alternative 1 would be mostly the same as the Preferred Alternative, with some exceptions. This Alternative would not include any road improvements within the

SMP boundary but would still include the piping and tie-in to the existing main outfall within the shoreline area. Existing research activities at the site would continue for the foreseeable future, but new buildings would not be constructed, which would limit the types of future research that could be undertaken at the site.

4.1.4 Mitigation Measures

No mitigation measures are required for the Preferred Alternative, No-Action Alternative, or Action Alternative 1 in relation to land use.

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4.2 GEOLOGICAL RESOURCES

This section describes the existing geological setting of the project area and evaluates impacts of the Proposed Action associated with geological resources. This includes hazards such as landslides, erosion, fault rupture, seismic shaking, liquefaction, sinkholes and subsidence, and effects to geological resources such as mineral resources or protected geologic features. Some geological hazards can be reduced or mitigated by engineering, design, or modified construction practices so that risks to health and safety are acceptable. The following geological hazards are discussed within this section:

Landslide Hazards: Areas prone to landslides, soil failure and/or subsidence resulting in movement of fill, soil, rock, or other geologic strata.

Erosion Hazards: Areas where soils may experience severe to very severe erosion due to construction activity. The susceptibility to erosion is generally a function of soil type, topography, wave or tidal action, occurrence of groundwater seepage or surface runoff, and the built environment.

Seismic Hazards: Areas subject to severe risk of earthquake damage from ground rupture, ground shaking, soil liquefaction, or tsunamis. Earthquakes are driven by geological processes which produce stresses in the earth's crust (plate tectonics). Seismic hazards can include the following:

- Ground rupture is a visible breaking and displacement of the Earth's surface along the trace of the fault, which may be of the order of several feet in the case of major earthquakes. Therefore, ground rupture only occurs along an active fault trace.
- The most damaging effect of an earthquake is strong shaking at the ground surface. It is well observed that the presence of soft soils on top of bedrock amplifies the ground surface shaking during an earthquake, therefore ground shaking during an earthquake is strongest in areas of soft, unconsolidated soils, such as artificial fills, in river valleys or along shorelines of bays and lakes. Ground shaking can occur far from the earthquake source. A method for characterizing the ground-motion amplifying effects has been developed and modified since 1994. In 1997, the simplified site class groupings were adopted by the International Code Council in the Uniform Building Code and are referred to as National Earthquake Hazard Reduction Program site classes.
- Liquefaction is a phenomenon in which strong earthquake-generated ground shaking cause soil to rapidly lose its strength and temporarily behave like liquid or quicksand. Liquefaction typically occurs in artificial fills and in areas of loose granular soils that are saturated with water, such as low-lying coastal areas, lakeshores, and river valleys. Lateral spreading is a related phenomenon that involves lateral displacement of large, intact blocks of soil down gentle slopes or toward a steep free face such as a stream bank or coastal margin, due to liquefaction of a shallow underlying deposit during an earthquake.
- Tsunamis are destructive waves that can be caused by coastal or submarine landslides or volcanism, but they are most commonly caused by large submarine earthquakes. Tsunamis are generated when these geologic events cause large, rapid movements in the sea floor that displace the water column above, generating a series of high-energy waves that radiate outward. Offshore tsunamis can strike adjacent shorelines within minutes and also cross the ocean at speeds as great

as 600 miles per hour to strike distant shores. The potential impacts of a tsunami include the adverse effects of temporary inundation by the tsunami wave and damage/injury caused by debris carried by the wave.

4.2.1 Regulatory Setting

FEDERAL

Federal Land Policy and Management Act

The Federal Land Policy and Management Act of 1976 (PL 94-579) requires that the public lands be managed in a manner that protects the "… quality of scientific ..." and other values, which includes paleontological resources such as fossils. Paleontological resources may also be protected by the Antiquities Act or the Archaeological Resources Protection Act.

Occupational Safety and Health Administration

The Occupational Safety and Health Administration's (OSHA) Excavation standards, Title 29 Code of Federal Regulations (CFR) Part 1926, Subpart P, contain requirements for excavation and trenching operations. The standards apply to all open excavations made in the earth's surface, including trenches. The standards include specific excavation requirements, including designation of an excavation competent person and monitoring/inspection requirements, as well as requirements for protective systems such as sloping/benching or shoring.

STATE

Washington State Department of Natural Resources

DNR is charged with administering many statewide rules as they pertain to harvesting and protecting the state's natural resources. DNR's Geology and Earth Resources Division regulates geologic activities that take place throughout the state pertaining to: oil and gas, geothermal activities, metals, mining and milling, and surface mining reclamation. DNR also monitors, assesses, and informs the public, planners, and municipal officials about the known risks associated with Washington's earthquakes, landslides, and volcanoes to reduce the human and financial costs of natural disasters.

DNR also establishes and manages nearly 120,000 acres within Natural Resources Conservation Areas The majority of Natural Resources Conservation Areas protect outstanding examples of ecosystems, habitats, and landscapes, but some also protect geologic sites of importance.

LOCAL

Kitsap County Comprehensive Plan 2016-2036

Kitsap County's Comprehensive Plan includes a Mineral Resource Overlay, which designates and protects land containing mineral resources of long-term significance (Kitsap County 2020a). The Mineral Resource Overlay designation combines other land use designations to limit mineral activity to areas

within the Mineral Resource Overlay while restricting intense rural land uses within the Mineral Resource Overlay to preserve future access to the mineral resources.

Kitsap County Code

Under the Kitsap County Code, Chapter 12.10, a site development activity permit is typically required for redevelopment projects in unincorporated Kitsap County resulting in 2,000 SF or more of new or replaced hard surface area or disturbance of 7,000 SF or more. Under Chapter 12.16, an approved engineered grading plan is typically required for projects with 5,000 CY or more of cut and fill, or disturbance of 1 acre or more in unincorporated Kitsap County. Chapter 14, Buildings and Construction, sets out building code requirements for development within unincorporated Kitsap County, including County-specific seismic design criteria. As with all local permit processes, NOAA as a federal agency would comply with Kitsap County Code requirements to the maximum extent practicable, as defined under the Public Buildings Amendments of 1988.

4.2.2 Affected Environment

TOPOGRAPHY, GEOLOGY, SOILS

The LOD for the Preferred Alternative includes approximately 11 acres of uplands that are adjacent to the shoreline and submerged aquatic lands of Clam Bay. The existing MRS facilities are located on a relatively flat section of land ranging in elevation from 13 to 18 feet NAVD88. To the west and north of the developed portions of the site are forested areas. These upland areas range in elevation from approximately 20 to 68 feet NAVD88. Adjacent to the northeast (on EPA-owned property) is a capped landfill.

Published geological information indicates that the NOAA property contains Quaternary aged glacial deposits, underlain with Holocene marine terrace deposits and Tertiary volcanic and marine sedimentary deposits (Yount et al 1993). Site-specific geotechnical investigations for a previous construction project at the MRS facility (Krazan and Associates 2011) identified 3 to 7 feet of topsoil underlain by loose silty sand with gravel fill. The fill is underlain by 14 to 18 feet of clayey silt glaciolacustrine deposits. Groundwater was not encountered during the 2011 geotechnical investigation, with the exception of perched groundwater noted from 3 to 4 feet depth in one boring. Similar soil conditions were identified during investigations performed in the landfill area just north of the MRS facility (Hart Crowser 1997). More detailed information relating to groundwater conditions is provided in Section 4.5, *Water Resources and Hydrological Processes*.

GEOLOGICAL HAZARDS

Ecology's Coastal Atlas mapping tool indicates that the NOAA property is classified as having "stable" slopes (Ecology 2022) and no historic landslide deposits have been mapped at the NOAA property (DNR 2018). Kitsap County has identified the sloped area to the northwest of Building 13 as having a "Moderate" erosion hazard, and the very steepest portions of this slope are mapped as "Moderate" landslide hazard (Kitsap County 2022). See Figure 4.2-1.

According to the Kitsap County Regional Shoreline Feasibility and Prioritization Study (Kitsap County 2012), the NOAA property is mapped as low or very low risk to infrastructure for sediment and erosion issues and is not in an area with protection or restoration projects prioritized. However, NOAA staff have reported recent erosion and undercutting of the coastal embankment near the kelp/algae tanks at the center of the property's coastline (USACE 2019).

In the Pacific Northwest, oceanic crust is being pushed beneath the North American continent along a major boundary parallel to the coast of Washington and Oregon. This boundary, known as the Cascadia Subduction Zone, lies approximately 50 miles offshore and extends from the middle of Vancouver Island in British Columbia past Washington and Oregon to northern California. The Puget Sound area is in a high seismicity region in the western U.S., with regional ground-motion hazard governed by the following:

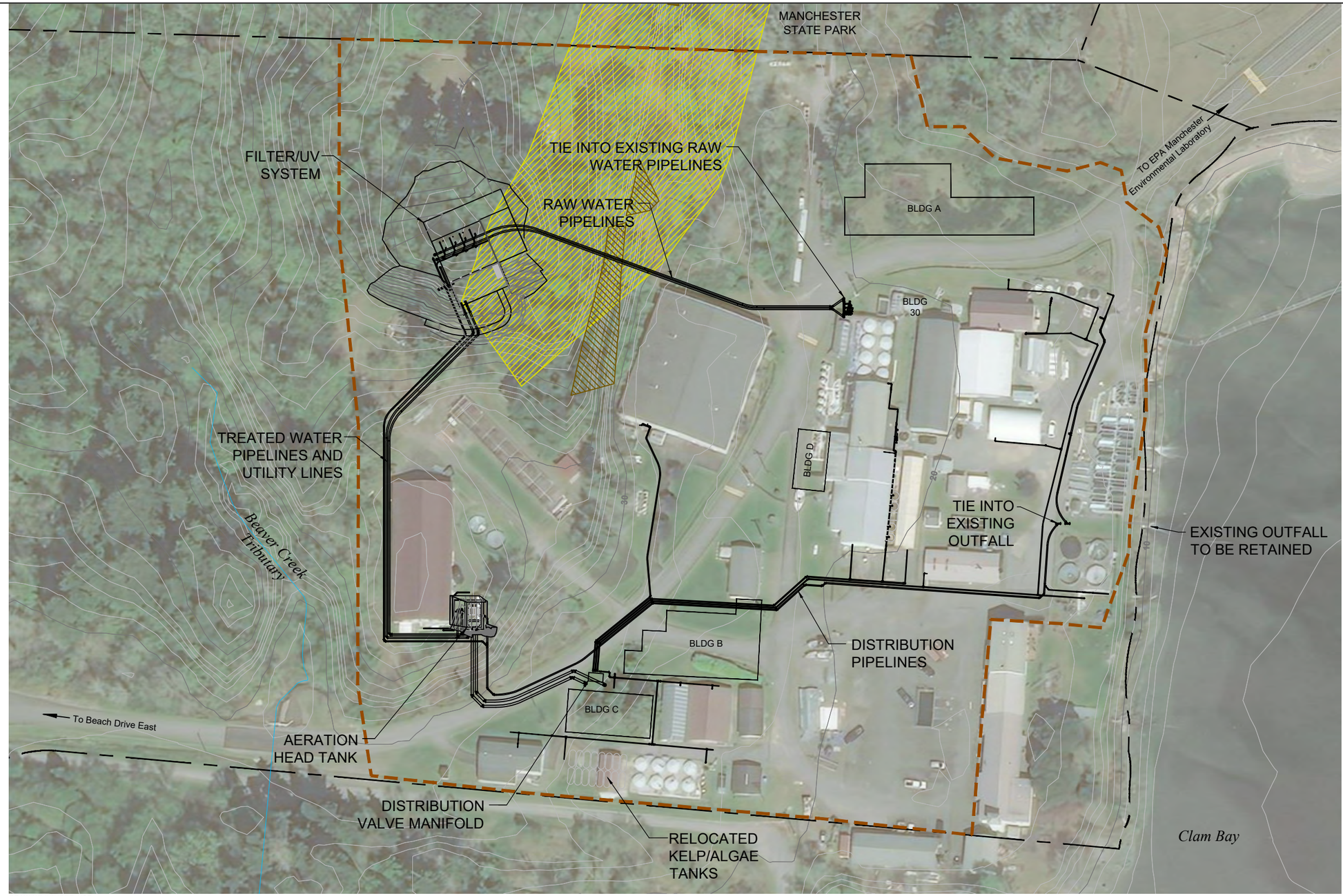
- Great magnitude ($M > 8$) earthquakes on the interplate[2] portion of the Cascadia Subduction Zone;
- Large magnitude ($6 < M < 7.5$) earthquakes on the intraplate[2] portion of the Cascadia Subduction Zone, at depths ranging between approximately 40 km and 90 km; and
- Moderate to large magnitude shallow crustal earthquakes, including those events capable of occurring in known active faults, such as the Seattle and South Whidbey Island faults.

The site is within the Seattle Fault Zone (SFZ). The DNR Geologic Information Portal identifies an unnamed, east-west trending fault which is part of the SFZ approximately 1,000 feet to the south of the site, and an unnamed, northeast to southwest trending fault approximately 1,000 feet to the north (DNR 2018). The site is also identified being subject to very strong or severe ground shaking intensity during a seismic event associated with the Cascadia Subduction Zone or Seattle Fault Zone, respectively (DNR 2018).

According to hazard maps of Kitsap County, Washington (Palmer et al., 2004a; 2004b) prepared by the state DNR, the LOD has a very low to low liquefaction susceptibility and is designated Site Class C under the National Earthquake Hazard Reduction Program[3]. Site specific field investigations support a low liquefaction risk due to the dense and compact nature of the glaciolacustrine deposits.

[2] Interplate refers to seismic events that occur where two tectonic plants meet; intraplate refers to events that occur within a single plate.

[3] Site class C represents a dense rock or soft clay condition, where earthquake shaking is slightly amplified by the near-surface geology. Site classes D, and E represent increasingly softer soil conditions which result in a progressively increasing amplification of ground shaking. Site class provides only a general guide to areas where shaking will be the strongest and where the potential damage to buildings and other structures may be elevated because of soil effects. Site class does not incorporate other factors affecting the actual severity of ground shaking, such as the magnitude of the earthquake and distance from the epicenter (Palmer et al., 2004a).



50 0 50 100

SCALE IN FEET

LEGEND

- PROPERTY BOUNDARY
- LIMITS OF DISTURBANCE
- PROPOSED ACTION COMPONENTS
- 2' ELEVATION CONTOURS (NAVD88)
- HIGH LANDSLIDE HAZARD AREA
- MODERATE EROSION HAZARD AREA

DRAWING SOURCE: HDR.
IMAGERY SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY
HAZARD AREA SOURCE: KITSAP COUNTY, 2022
CONTOURS FROM USGS NATIONAL ELEVATION DATASET, 2015.

AECOM

GEOLOGICAL HAZARD ZONES

NOAA NWFSC MANCHESTER RESEARCH STATION
FEBRUARY 2023 SEAWATER SYSTEM REPLACEMENT AND CAMPUS ADDITION PROJECT
60680959 MANCHESTER, WASHINGTON

FIGURE 4.2-1

K:\Puget_Sound\MKD\JPE.dwg Mar 06, 2023 - 10:39am

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The coastal edge (approximately 30 to 50 feet inland from the coastal embankment) and northwest corner of the NOAA property, as well as areas near the mouth of Beaver Creek to the south, are within the tsunami inundation model areas for a SFZ rupture event of magnitude 7.3 or greater, or a Cascadia Fault Zone event of magnitude 9.1 or greater (DNR 2018). A more recent study published by Washington Geological Survey identifies the shoreline of Clam Bay as a "shoreline where inundation is inferred but not quantified" during a magnitude 7.5 or greater SFZ rupture event, with modeled maximum current speeds of 6 to 9 knots near the shoreline and greater than 9 knots in some offshore areas (Dolcimascolo et al 2022).

MINERAL RESOURCES AND PROTECTED GEOLOGICAL FEATURES

There are no protected mineral resources near the MRS. There are no Natural Resource Conservation Areas or other protected geologic sites in the vicinity of the MRS. The closest Conservation Area is the Stavis Natural Resource Area approximately 15 miles to the west (DNR 2022).

4.2.3 Environmental Consequences

PREFERRED ALTERNATIVE

Excavation would be necessary for trenching and installation of the seawater piping infrastructure, as well as for the Filter/UV System, Aeration Head Tank, and Distribution Manifold during Phase 1 construction; and for the construction of up to four new buildings and associated site improvements during Phase 2.

The pipe trenching would require a maximum excavation depth of 6 feet below ground surface for the largest pipes (24-inch diameter), with shallower trenches for the smaller diameter pipes. The width of trenches will vary depending on the pipe diameter and number of pipes per trench but is not expected to exceed 5 feet. Trenches would be backfilled with imported gravel and suitable stockpiled on-site excavated soils. The total area of temporary soil disturbance for Phase 1 construction would be approximately 48,000 SF (approximately 1.1 acres) as described in Table 2-3 in Section 2.1.4, *Site Preparation and Construction Activities*. Based on conservative estimates, up to approximately 6,600 CY of excess spoils could be generated during Phase 1, which would be disposed of offsite at a suitable landfill facility. Up to approximately 2,400 CY of clean, construction grade fill would be required for Phase 1, which would be sourced from a suitable commercial vendor within approximately 15 miles of the project area.

The amount of soil disturbance Phase 2 construction is estimated at approximately 42,000 SF (approximately one acre), as detailed in Table 2-4 in Section 2.1.4, Site Preparation and Construction Activities. The proposed buildings would be single-story, metal-frame construction with concrete foundations. The exact type and depth of foundation would be determined during design based on the site-specific geotechnical conditions, but could require drilled concrete piles to a depth of approximately 9 feet. Based on conservative estimates of average foundation depth, an estimated 3,700 CY of excess spoils could be generated during Phase 2, which would be disposed of offsite at a suitable landfill facility.

Landslide Hazards

As noted above, the majority of the LOD is not within a known landslide hazard area, except for a small area of sloped land to the west of Building 13, which is identified as having moderate potential for landslides (Kitsap County 2022). Approximately 25 linear feet of the raw water pipeline would cross the landslide hazard area, approximately perpendicular to the slope. Installation of the pipeline would require vegetation removal along an approximately 10-foot wide corridor and trenching up to approximately 6 feet depth. Trenching activities would be temporary and backfilled to approximately existing ground surface once the pipes have been installed. Because the trenching would be perpendicular to the slope, rather than parallel, the potential for destabilization of the slope would be reduced. Furthermore, OSHA excavation standards would apply to all trenching activities, which require protective systems such as trench wall sloping, benching, or shoring to be used to prevent collapse. Overall, with implementation of the BMPs described in Section 4.2.4 below, the impact would be *short term and minor*.

Erosion Hazards

The majority of the LOD is not within a known erosion hazard area, except for the slope to the west of Building 13 which is identified as a moderate erosion hazard area (Kitsap County 2022), as shown on Figure 4.2-1. Approximately 150 linear feet of the raw water pipeline and a portion of the Filter/UV System would be located within the erosion hazard area. As discussed above, the pipelines would be installed approximately perpendicular to the slope and trenching would be undertaken in accordance with OSHA excavation standards. Tree cover is extensive on the slopes on the west side of the NOAA property, which would minimize the risk of substantial erosion; however, the proposed action would require clearance of vegetation within the footprint of the Filter/UV System and along the pipeline corridor. The potential for erosion from disturbed areas during construction is discussed in more detail in Section 4.5, *Water Resources and Hydrological Processes*. As discussed in that section, with implementation of standard best management practices (BMPs) as part of a Stormwater Pollution Prevention Plan (SWPPP) prepared in compliance with EPA's Construction Stormwater General Permit, the potential for erosion from disturbed areas of the site during construction would be reduced and the impact would be *short-term and minor*.

Once construction of the Preferred Alternative is complete and all temporary disturbance areas have been reinstated, there would be no substantial change in the potential for erosion hazards at the site. As discussed further in Section 4.5, *Water Resources and Hydrological Processes*, the minor increase in discharge volume and velocity from the existing main outfall to Clam Bay is not anticipated to cause increased erosion of tidal sediments or the coastal embankment, as the outfall discharges onto rip-rap. The long-term impact to erosion from operation of the Preferred Alternative would be *negligible*.

Ground Rupture

The site is situated in the middle of the SFZ, with fault traces passing both north and south of the site. The nearest known fault trace is approximately 1,000 feet away. The Preferred Alternative would not result in construction of new buildings across or immediately adjacent to a known fault trace; therefore, impacts from fault rupture hazards would be *negligible*.

Ground Shaking / Ground Motion Amplification

Due to its location within a seismically active area, the potential for high levels of ground shaking exists at the NOAA property. The Preferred Alternative would not exacerbate the potential for seismic ground shaking, which is a function of the location of the epicenter, the size of the event, and the underlying geological formations, none of which would be adversely affected by the Preferred Alternative. The presence of Site Classes C (Palmer et al 2004a) represents mostly stable soil conditions which will not result in significant amplification of ground shaking. Soils at the NOAA property are comprised of dense and compact glaciolacustrine deposits that are not prone to liquefaction.

The Preferred Alternative would include the construction of new infrastructure and habitable laboratory and office buildings and would result in an increase in the number of people present at the MRS facility, thereby increasing the potential for structural damage or human safety impacts during a seismic event. The Preferred Alternative, like all construction projects, are required to follow seismic design standards found in the most recent version of the Uniform Building Code, which includes measures to ensure that structures can withstand the maximum expected ground shaking without catastrophic failure. While complete avoidance of any damage may not be feasible, incorporation of industry-standard seismic design measures in accordance with current Uniform Building Code standards would result in potential impacts from strong seismic ground shaking to be *minor*.

Tsunamis

Although the shoreline of the MRS may be subject to inundation during a large tsunami event, the LOD for the Preferred Alternative is not within a mapped tsunami hazard zone. Furthermore, the components of the Preferred Alternative closest to the shoreline would be buried pipelines that would not result in any increased hazard associated with tsunami. There would be *no impact*.

Geological Resources

Due to the lack of mineral resources or protected geologic features at or near the MRS, the Preferred Alternative would have *no impact* on geological resources.

NO-ACTION ALTERNATIVE

Under the No-Action Alternative, no construction activities would occur and the existing facilities would remain at the site and continue to operate in the existing manner, until such time as the existing seawater distribution system eventually fails. Because there would be no construction or intensification of use at the site, there would be *no impacts* relating to geological hazards or geological resources under the No-Action Alternative.

ACTION ALTERNATIVE 1

Impacts from soil erosion during construction of Action Alternative 1 would be the same as described for Phase 1 of the Preferred Alternative and would be less than for the Preferred Alternative as a whole, due to the substantial reduction in the area of temporary ground disturbance.

Impacts from geological hazards for Action Alternative 1 would also be reduced compared to the Preferred Alternative, as this alternative would introduce fewer new structures to the site, thereby not exacerbating the potential for structural damage as much as the Preferred Alternative; and would not increase the number of site personnel, thereby avoiding any increased potential for human safety impacts during a seismic event.

4.2.4 Mitigation Measures

PREFERRED ALTERNATIVE

No mitigation measures are required for the Preferred Alternative for impacts associated with geological resources.

The following standard BMPs and requirements would be followed during construction:

- The construction contractor would prepare and implement a Construction SWPPP and other erosion control measures as detailed in Section 4.5, *Water Resources and Hydrological Processes*.
- Trenching and excavation activities would be undertaken in accordance with OSHA excavation standards (29 CFR Part 1926 Subpart P).

NO-ACTION ALTERNATIVE

No mitigation measures are required for the No-Action Alternative.

ACTION ALTERNATIVE 1

No mitigation measures are required for Action Alternative 1. The BMPs for Action Alternative 1 are the same as for the Preferred Alternative.

4.3 CLIMATE CHANGE AND SEA LEVEL RISE

According to the Fourth National Climate Assessment (May et al. 2018) the impacts of climate change area already being felt in communities across the country because of human activities and emissions of greenhouse gases. Greenhouse gases (GHGs) are natural or anthropogenic gases that trap heat in the atmosphere. Much of the trapped heat is absorbed by the oceans, resulting in thermal expansion and sea level rise. Sea level rise increases the risk of flooding from storm events, astronomical tides, and wave run-up. Other changing conditions include warmer air temperatures, increased frequency of severe weather events, ocean acidification, reductions in winter snowpack, increased drought, and increased duration and severity of wildfires.

This section describes existing climate change conditions and evaluates impacts of the Proposed Action on climate change through the contributions of greenhouse gases during construction and operations. The analysis in this section is qualitative, due to a lack of baseline greenhouse gas emissions inventory or other related facility-specific information for emissions. None of the GHG estimating tools and resources provided by CEQ (https://ceq.doe.gov/guidance/ghg-tools-and-resources.html) are considered appropriate for the types of activities undertaken at the existing MRS facility (or that would be undertaken at the facility following implementation of the Proposed Action). The MRS is not required to report annual emissions to the EPA's National Emissions Inventory (https://www.epa.gov/air-emissions-inventories/national-emissions-inventory-nei). Because no single project is large enough individually to result in a measurable increase in global concentrations of GHG emissions, climate change impacts of a particular project are considered on a cumulative basis.

This section also evaluates the impact of climate change on the Proposed Action. Because of its coastal setting, the section will focus on the impacts related to sea level rise. The assessment will again be qualitative due to a lack of site-specific sea level rise modeling data available.

4.3.1 Regulatory Setting

FEDERAL

NOAA Administrative Order 216-6A Companion Manual, Section 6.F(i): Considering a Proposed Action's Contribution to Climate Change

As long as tools, methodologies, or data inputs are reasonably available, decision makers should quantify a Proposed Action's projected direct and indirect GHG emissions. The Council on Environmental Quality has compiled a repository of available GHG accounting tools (Council on Environmental Quality 2022a). Decision makers can then use projected GHG emissions as a proxy for assessing potential climate change effects when preparing a NEPA analysis.

When the decision maker does not quantify the action's projected GHG emissions because tools, methodologies, or data inputs are not reasonably available to support calculations for a quantitative analysis, the decision maker should include a qualitative analysis in the NEPA document and explain the basis for determining that quantification is not reasonably available.

NOAA Administrative Order 216-6A Companion Manual, Section 6.F(ii): Considering the Impact of Climate Change on a Proposed Action

Because NEPA reviews require decision makers to consider the impacts of proposed actions and alternative into the future, these analyses must consider these actions in the context of the future state of the environment, which includes consideration of the impacts of climate change on the environment. Decision-makers need not undertake new research or analysis of potential climate change impacts in the Proposed Action area but may instead summarize and incorporate by reference the existing relevant scientific literature, including the most recent national climate assessment or reports from the US Global Change Research Program.

Executive Order (EO) 14057 Catalyzing Clean Energy Industries and Jobs through Federal Sustainability

In responding to the climate change crisis, President Biden issued EO 14057 to achieve a carbon pollution-free electricity sector by 2035 and net-zero emissions economy-wide by no later than 2050. Federal facilities serve as a nexus to reduce emissions while improving energy efficiency and strengthening resiliency and sustainability. Implementing Instructions for EO 14057 (Council on Environmental Quality 2022b) state that all new construction and modernization project greater than 25,000 gross square feet (GSF) to be designed as a Federal net-zero emission building. EO 14057 also requires new construction and modernization projects to include requirements to reduce and divert construction and demolition debris from landfills and other disposal facilities.

STATE

Climate Commitment Act

Washington's comprehensive climate law is the Climate Commitment Act signed on May 17, 2021, which establishes a "cap and invest" program to set a limit on the amount of greenhouse gases that can be emitted in Washington (the cap) and then auctions off allowances for companies and facilities that emit greenhouse gases until that cap is reached. Over time, the cap will be reduced to match greenhouse gas emissions limits set in 2020 (e.g., reduce to 1990 levels by 2020; 45% below 1990 levels by 2030; 70% below 1990 levels by 2040, and 95% below 1990 levels by 2050). Facilities and state agencies that emit at least 10,000 metric tons of carbon dioxide equivalent per year (Washington Department of Ecology 2020) are required to report their emissions and publish an inventory of greenhouse gases to help with the development of policies and programs.

LOCAL

Kitsap County Climate Change Resiliency Assessment (2020)

The Kitsap County Climate Change Resiliency Assessment (Kitsap County 2020) notes that low-lying coastal areas have already been more susceptible to recurring flooding events in Kitsap County, and that future climate projections for the Puget Sound area will continue to exacerbate the vulnerability of low-lying coastal areas to climate impacts. Kitsap County presented sea level rise scenarios derived from an

interactive sea-level rise data visualization tool from the University of Washington Climate Impacts Group with data from Sea Level Rise in Washington State – a 2018 Assessment (Miller et al. 2018).

Kitsap County Multi-Hazard Mitigation Plan (2019)

The Kitsap County Multi-Hazard Mitigation Plan (Kitsap County 2019) identifies and evaluates specific hazards and presents hazard mitigation strategies related to flooding, severe storm, land shift, earthquake, drought, and tsunami.

4.3.2 Affected Environment

The Pacific Northwest has warmed nearly 2 degrees Fahrenheit since 1900 and is expected to continue to warm during all seasons under all future climate scenarios, though the rate of warming depends on current and future emissions of greenhouse gasses and on the response of Earth's climate system (May et al 2018). The NOAA property is located on the east side of the Olympic Peninsula adjacent to Clam Bay, along the Rich Passage. The shoreline adjacent to the research station is relatively flat and contains estuarine and marine wetlands, according to the National Wetlands Inventory (refer Section 4.9, *Wetlands*).

The shoreline is mapped as Zone AE by Federal Emergency Management Agency (FEMA) defined as a special flood hazard area that has a 1% chance of annual flood and based on 2017 data (FEMA 2017). This area is generally limited to the shoreline and does not extend far inland and onto the NOAA property, although some temporary structures (e.g., kelp tanks) are located within the mapped flood zone. The rest of the property is mapped as Zone X, defined as an area of minimal flood hazard. According to the Kitsap County Regional Shoreline Feasibility and Prioritization Study (Kitsap County 2012), the NOAA property is mapped as low or very low risk to infrastructure for sediment and erosion issues and is not in an area with protection or restoration projects prioritized. However, NOAA staff have reported recent erosion and undercutting of the coastal embankment near the kelp tanks at the center of the property's coastline (USACE 2019).

Neither the FEMA flood maps nor the Regional Shoreline Study account for sea level rise. It is generally expected that the risks of coastal flooding and erosion will increase with future sea level rise. The NOAA property is not mapped as affected for sea level rise between 0 and up to 5 feet (NOAA 2022). Small portions of the northern and southern edges of the property are mapped within modeled areas for inundation by 6 feet of sea level rise, and by 9 feet of sea level rise, most of the developed areas of the research station would be inundated. Based on a 50-year planning horizon for the site, sea level is likely to rise by 1.2 feet (50% probability) to 2.6 feet (1% Probability) by the year 2070, relative to the average from 1991-2009[4] (Miller et al. 2018).

[4] Assumes RCP 8.5 (High Scenario); (Washington Coastal Resiliency Network 2018)

4.3.3 Environmental Consequences

PREFERRED ALTERNATIVE

Construction

Greenhouse gas emissions generated during construction of the Proposed Action would be short-term, lasting approximately 24 months. Equipment used during construction (as detailed in Section 2.1.3) would include crane, backhoes, grader, dozer, vibratory or sheepsfoot roller, concrete trucks, concrete pumps, and tree-removal equipment. Indirect effects would also result from removal of trees. Adherence to applicable rules and regulations set forth by the Puget Sound Clean Air Agency that pertain to emission standards for construction equipment, and implementing typical tailpipe emission reduction practices, would reduce construction related GHG emissions. As stated in Section 4.15, construction and demolition waste would be reused on-site to the extent possible, to reduce the need for haul trips, with materials unsuitable for reuse taken to a transfer station or discarded to the appropriate landfill. Given the short construction duration and intensity, it is anticipated that impacts due to construction related GHG emissions would be *short term and minor*.

Operation

Greenhouse gas emissions related to operations of the Preferred Alternative are expected to be long-term and minor. The new seawater distribution system will not significantly change or increase current maintenance and operations at the site. Because the new buildings would not exceed 25,000 GSF, compliance with EO 14057 would not be required. Regardless, considerations for reducing emissions have been incorporated into the Preferred Alternative, such as efficient campus-wide site design, space optimization, and energy efficiency, and best practices from the CEQ's Guiding Principles for Sustainable Federal Buildings would be implemented, where feasible.

Operation of the Preferred Alternative would add capacity for six additional permanent staff, ten additional temporary (daily or weekly) visitors on an occasional basis, and a slight increase in deliveries to the research station. Emissions relating to operational transportation would therefore increase proportionately, which would result in a minor increase in operational traffic. For all these reasons, greenhouse gas emissions related to operations of the Preferred Alternative are expected to be *long-term and minor*.

Sea Level Rise

None of the Preferred Alternative components are within the area anticipated to be affected by sea level rise of less than 5 feet. Based on the modeling conducted by Miller et al. (2018), which predicted 2.6 feet of sea level rise by 2070 (with a 1% probability) and the sea level rise mapping by NOAA, the Preferred Alternative would not be affected by sea level rise within the next 50 years. All proposed actions would be upland of the higher high water level (11 feet NAVD88). The finished grade elevation of the proposed facilities and pipeline routes range from 68 feet MSL to 18 feet MSL. The finished grade elevation of the proposed buildings has not yet been determined; however, the proposed building footprints and associated access improvements currently range in elevation from approximately 15 feet MSL (Building A) to 25

feet MSL (Building C). The impacts of sea level rise on the Preferred Alternative would be *long-term and negligible*.

NO-ACTION ALTERNATIVE

The No-Action Alternative assumes that no construction activities would occur and that the existing facilities would remain at the site and continue to operate in the existing manner, until such time as the existing seawater distribution system eventually fails. There would be no construction-related GHG emissions from the No-Action Alternative, and no change to existing emissions in the near term, as existing research activities would continue, no substantial new research would occur at the site, and there would be no increase in employee numbers. In the long term, existing GHG emissions would be anticipated to substantially reduce after the existing seawater system fails, as the majority of research activities at the site would cease. The impact of the No-Action Alternative on climate change would be *negligible*.

As noted above, only a few temporary structures are located within the coastal flood zone and none of the existing structures are within the area anticipated to be affected by sea level rise within the next 50 years.

ACTION ALTERNATIVE 1

Action Alternative 1 assumes all the same consequences as listed in the Preferred Alternative for the seawater distribution system only. Action Alternative 1 would not include construction of four new buildings or changes to the configuration of parking and access roads. Action Alternative 1 would be subject to the same amount of sea level rise and associated flooding risk as both Preferred Alternative and the No-Action Alternative.

4.3.4 Mitigation Measures

PREFERRED ALTERNATIVE

No mitigation measures are required for the Preferred Alternative in relation to sea level rise.

Other than standard best management practices for construction emissions (see Section 4.4.4 for *Air Quality*), no mitigation measures are required for the Preferred Alternative in relation to greenhouse gas emissions. However, implementation of the following measures, to the extent practicable, are recommended to further reduce greenhouse gas emissions from the Preferred Alternative:

- Design of new buildings to be Leadership in Energy and Environmental Design certified
- Implementation of CEQ's Guiding Principles for Sustainable Federal Buildings
- Installation of electric vehicle charging station(s)
- Planting of trees to mitigate greenhouse gas emissions.
- Installation of solar panels on buildings, over parking spaces, on tanks, etc.

NO-ACTION ALTERNATIVE

No mitigation measures are required for the No-Action Alternative in relation to sea level rise and climate change.

ACTION ALTERNATIVE 1

Other than standard best management practices for construction (see Section 4.4.4), no mitigation measures are required for the Action Alternative 1 in relation to greenhouse gas emissions.

No mitigation measures are required for the Action Alternative 1 in relation to sea level rise.

4.4 AIR QUALITY

Air quality in a given location is described as the concentration of various pollutants in the atmosphere, generally expressed in units of parts per million (ppm) or micrograms per cubic meter. Short-term or long-term effects on air quality is determined by the type and cumulative amount of pollutants emitted into the atmosphere from various sources, the size and topography of the air basin, and the prevailing meteorological conditions. The significance of a pollutant concentration is determined by comparing it to federal and/or state ambient air quality standards. These standards represent the maximum allowable atmospheric concentrations that may occur and still protect public health and welfare with a reasonable margin of safety.

This section describes existing air quality conditions and evaluates impacts of the Proposed Action on air quality from project construction and operations. Impacts are associated with aspects of the project that result in the release of air quality pollutants, such as vehicle emissions and dust generated by movement of earth.

4.4.1 Regulatory Setting

FEDERAL

Clean Air Act

The Clean Air Act of 1970 (42 USC 7401 et seq.), as amended in 1977 and 1990, is the core federal statute governing air pollution. In addition to federal regulations, the Clean Air Act provides states with the authority to regulate air quality within state boundaries.

National Ambient Air Quality Standards (NAAQS)

The EPA, in Title 40 CFR Chapter 50, establishes NAAQS for six principal pollutants, called "criteria" pollutants, including: particulate matter (PM), sulfur dioxide, carbon monoxide, nitrogen dioxide, ozone, and lead. Under these regulations, PM is further regulated classified into two categories: coarse PM, having an aerodynamic diameter less than or equal to 10 microns (PM_{10}); and fine PM, having an aerodynamic diameter less than or equal to 2.5 microns ($PM_{2.5}$). The NAAQS include two levels of standards for each criteria pollutant: primary standards developed to protect public health, and secondary standards developed to protect public welfare. While the EPA sets and regularly reviews the NAAQS, states are responsible for attaining and maintaining the standards.

Areas that meet the NAAQS for a criteria pollutant are designated as being in "attainment" while areas where criteria pollutant levels exceed the NAAQS are designated as "nonattainment" areas. The nonattainment classifications for carbon monoxide and PM_{10} are further divided into moderate and serious categories. Ozone nonattainment areas are further classified based on the severity of the pollution problem, which is considered basic, marginal, moderate, serious, severe, or extreme. A maintenance area is an area that was formerly a nonattainment area and has recently been re-designated as an attainment

area. During the maintenance period, most of the Clean Air Act rules for nonattainment areas continue to apply in these areas.

General Conformity Rule

The EPA promulgated a General Conformity Rule (Section 110 of the Clean Air Act and Title 40 CFR Part 51.853) that requires responsible federal agencies to make determinations of conformity of actions with State Implementation Plans. Each federal action within a non-attainment or maintenance area must be reviewed to determine whether it (1) qualifies for an exemption listed in the General Conformity Rule; (2) results in emissions that are below General Conformity Rule *de minimis* emissions thresholds; or (3) would produce emissions above the General Conformity Rule *de minimis* thresholds applicable to the specific area, requiring a detailed air quality conformity analysis.

Mobile Source Air Pollution Control Requirements

Mobile source air pollution control requirements for gasoline and diesel on-road engines are codified in 40 CFR 80, 40 CFR 85, and 40 CFR 86. The Clean Air Act initially set air quality standards, and in 1991 the EPA began introducing Tier standards to reduce engine emissions, with Tier 1 standards phased in through the late 1990s, Tier 2 standards between 2001 and 2005, and Tier 3 standards beginning in 2006. The most recent emission standards under Tier 3 were finalized in 2014, to be phased in between 2017 and 2025.

STATE

Washington State General Regulations for Air Pollution Sources (Washington Administrative Code [WAC] 173-400)

Establishes technically feasible and reasonably attainable standards and establishes rules generally applicable to the control and/or prevention of the emission of air contaminants.

Washington State Controls for New Sources of Toxic Air Pollutants (WAC 173- 460)

Establishes the systematic control of new or modified sources emitting toxic air pollution to prevent air pollution, reduce emissions, and maintain air quality that will protect human health and safety.

Washington State Ambient Air Quality Standards (WAC 173-476)

Establishes the maximum acceptable levels in the ambient air for particulate matter, lead, sulfur dioxide, nitrogen dioxide, ozone, and carbon monoxide.

Washington State Clean Air Act (RCW 70A.15)

Establishes the public policy to preserve, protect, and enhance the air quality for current and future generations. Establishes rules to preserve acceptable air quality and levies penalties for violations.

LOCAL

Kitsap County falls under the jurisdiction of the Puget Sound Clean Air Agency (PSCAA), which has a goal of protecting public health, improving neighborhood air quality, and reducing greenhouse gases. This agency monitors air pollution and has various regulations (most recently updated in June 2022), which pertain to operating permits, outdoor burning, emission standards, non-road engines, and other aspects of air quality. There are no pertinent air quality regulations specific to Kitsap County.

4.4.2 Affected Environment

REGIONAL AIR QUALITY

For air quality purposes, the study area for the Proposed Action encompasses the four-county urban area of King, Kitsap, Pierce, and Snohomish County, which corresponds to the area over which PSCAA has jurisdiction. PSCAA and Ecology work together to monitor air quality in the Puget Sound region. This four-county area encompasses a large portion of the Everett-Seattle-Tacoma urban area, as well as surrounding communities in the Puget Sound region.

PSCAA develops annual air quality data summaries that provide an overview of regional air quality. The most recent summary was completed in 2021 (PSCAA 2021a), with a detailed report available for 2020 (PSCAA 2021b). These reports provide information about air quality in the region, as well as by county. Based on these reports air quality in the Puget Sound Region is generally good. $PM_{2.5}$ and ozone are the pollutants of greatest concern in the region (PSCAA 2021b).

The Air Quality Index is a nationwide reporting standard for the criteria pollutants that is used to relate air quality levels to health effects in a simple way (good, moderate, unhealthy for sensitive groups, and unhealthy). In 2021, "good" Air Quality Index days continue to dominate the region's air quality (84 percent of days or better, depending on the county), with some "moderate" days (up to 61 days, depending on the county) and very few "unhealthy for sensitive groups" or "unhealthy" days resulting from wildfire smoke. Air quality in Kitsap County is generally better than that of the other three counties in the region, with 359 "good" days, 5 "moderate" days, and 1 "unhealthy for sensitive groups" day in 2021 (PSCAA 2021a).

ATTAINMENT STATUS AND REGIONAL AIR QUALITY CONFORMITY

The NOAA property is in an area that is in attainment for all criteria pollutants. There are no non-attainment or maintenance areas in Kitsap County (EPA 2022). Therefore, a general conformity review is not required for the Proposed Action. The larger four-county study area includes previous nonattainment areas that are covered by maintenance plans. They include the Interstate-5 corridor in King, Pierce, and Snohomish counties that was a previous non-attainment area for carbon monoxide, a large area in the Seattle-Tacoma urban area that was a previous non-attainment area for 1-hour ozone, small portions of King and Pierce counties that were previous non-attainment areas for PM_{10}, and the Tacoma area in Pierce County, which was a previous non-attainment area for $PM_{2.5}$ (EPA 2022).

4.4.3 Environmental Consequences

PREFERRED ALTERNATIVE

Construction

Construction of the Preferred Alternative would result in short-term effects to air quality associated with vehicle emissions, as well as earthmoving and other activities that generate fugitive dust. Work would occur in two phases, as described in Section 2.1.3, which together would last an estimated period of 2 years. Activities that would contribute to air quality impacts include removal and relocation of structures, vegetation removal, grading, trenching, placement of fill, paving of disturbed areas, and construction of new facilities.

During the 2-year construction period, elevated criteria air pollutant concentrations would result from increased tail-pipe emissions from construction equipment and personal vehicles of construction workers, and from fugitive dust. Construction equipment used during the 2-year construction period would include a crane, grader, dozer, roller, and multiple backhoes, concrete trucks, concrete pumps, and tree removal equipment. Additionally, as discussed in Section 4.14, *Transportation*, the Preferred Alternative is anticipated to generate up to 1,200 truck trips over the first 12-month phase of construction and up to 500 truck trips during the second 12-month phase, and up to a maximum of 100 worker trips per day throughout both phases. The number of construction workers required would vary throughout construction but are not anticipated to exceed 50 workers on site at any one time, resulting in approximately 100 additional vehicle movements per day[5] during peak construction periods.

Adherence to applicable rules and regulations set forth by the Puget Sound Clean Air Agency that pertain to fugitive dust emissions and emission standards of construction equipment and implementing typical fugitive dust reduction practices and tailpipe emission reduction practices, would reduce construction-related emissions and prevent dust emissions from traveling beyond work sites. Given the short construction duration and intensity (scheduled over 2 years), and relatively small construction area (approximately 1 acre of ground disturbance during each phase for a total of 2 acres disturbance), it is anticipated that air quality impacts due to construction would be *short term and minor*.

Operation

Long-term air quality effects pertain to the emissions associated with the operation of the new facilities once construction is complete. Because the new seawater distribution is a replacement of an existing facility no substantial change in operations is expected from this project component. Operation of the four new buildings would result in a minor long-term increase in the number of permanent staff, facility visitors, and deliveries. Vehicle emissions associated with commuting trips by six additional staff, occasional visits by up to ten additional daily or weekly visitors, and a slight increase in the number of delivery trucks would contribute to air quality impacts over the long term. The Preferred Alternative

[5] Daily vehicle trips calculated by doubling the number of construction workers, based on assumption that each worker would drive to the construction site in the morning and drive home in the afternoon.

would not include new generators, as the updated seawater system and new research/laboratory buildings would be connecting to the existing back-up generator on the site. Given the small increase in vehicle use associated with operations, and no new stationary emission sources such as generators, air quality impacts from project operations are expected to be *long-term and minor*.

NO-ACTION ALTERNATIVE

Under the No-Action Alternative there would be no construction activities, and over the long term, operation of existing facilities at the site would eventually cease. Over the short term there would be no substantial change to air quality emissions compared to baseline levels, and no associated impacts to air quality. Over the long term there could be a negligible benefit to local air quality with cessation of existing facility operations.

ACTION ALTERNATIVE 1

Construction

Construction of Alternative would result in short-term effects to air quality associated with vehicle emissions and generation of fugitive dust during replacement of the seawater treatment and distribution system, as well as earthmoving and other activities that generate fugitive dust. Only one phase of construction would occur, lasting an estimated period of 12 months. Activities that would contribute to air quality impacts include removal or relocation of the temporary Ocean Acidification facility, vegetation removal, grading, trenching, placement of fill, and paving of disturbed areas. Construction equipment used would be similar to the equipment described for the Preferred Alternative, and emissions associated with equipment, haul trucks, and worker vehicles would be similar to those over the first year of construction under the Preferred Alternative. However, construction emissions would only occur over a single year. It is anticipated that air quality impacts due to construction would be short-term and minor, and would be less than under the Preferred Alternative.

Operation

Because the new seawater distribution is a replacement of an existing facility, no substantial change in operations is expected under Action Alternative 1. There would be no increase in the number of permanent staff, facility visitors, and deliveries under this alternative, and therefore no or negligible long-term impacts to air quality.

4.4.4 Mitigation Measures

PREFERRED ALTERNATIVE

Other than standard BMPs for construction, such as dust control and limits on vehicle idling, no mitigation measures are required for the Preferred Alternative in relation to air quality.

NO-ACTION ALTERNATIVE

No mitigation measures are required for the No-Action Alternative in relation to air quality.

ACTION ALTERNATIVE 1

Other than standard BMPs for construction, such as dust control and limits on vehicle idling, no mitigation measures are required for Action Alternative 1 in relation to air quality.

4.5 WATER RESOURCES AND HYDROLOGICAL PROCESSES

This section describes the water resources that are present in the vicinity of the MRS, and potential effects of the Proposed Action on those resources. Water resources and hydrological processes refers to surface water (e.g., streams, creeks, rivers, etc.) and groundwater in the vicinity of the NOAA property.

4.5.1 Regulatory Setting

FEDERAL

Section 10 of the Rivers and Harbors Act

A USACE Individual Permit or Nationwide Permit under Section 10 of the Rivers and Harbors Act of 1899 is required prior to the accomplishment of any work in, over or under navigable waters of the U.S., or which affects the course, location, condition or capacity of such waters. Under Section 10, the limit of USACE jurisdiction is the mean high water line for tidal waters, or the ordinary high water line for non-tidal waters.

Section 404 of the Clean Water Act

A U.S. Army Corps of Engineers (USACE) Individual Permit or Nationwide Permit is required under Section 404 of the Clean Water Act prior to discharge of dredged or fill material into the waters of the U.S., including special aquatic sites such as wetlands (see Section 4.9, *Wetlands*). Under Section 404, the limit of USACE jurisdiction for waters of the U.S. is seaward of the mean higher high water line for tidal waters or the ordinary high water line for non-tidal waters (or to the delineated extent of adjacent coastal or freshwater wetlands, if present).

Section 401 of the Clean Water Act

Section 401 of the Clean Water Act requires that activities permitted under Section 404 meet state water quality standards. Ecology is designated by statute as the state agency responsible for issuing a Section 401 Water Quality Certification (WQC) in Washington when the agency has reasonable assurance that the applicant's project will comply with state water quality standards and other aquatic resource protection requirements under Ecology's authority. The Section 401 Certification can cover both the construction and operation of a proposed project. Applying for a federal permit or license to conduct any activity that might result in a discharge of dredge or fill material into water or non-isolated wetlands or excavation in water or non-isolated wetlands triggers Section 401 review. Conditions of the Section 401 Certification become conditions of the Federal permit or license. The federal permit is not valid unless it has been certified by Ecology. A Section 401 WQC request form, along with a Joint Aquatic Resource Permit Application (JARPA), is required when a Section 401 WQC is needed from Ecology. Section 438 of the Energy Independence and Security Act

Under Section 438 of the Energy Independence and Security Act of 2007 (EISA), federal agencies are required to reduce stormwater runoff from federal development and redevelopment projects to protect water resources. This provision applies to any development or redevelopment project involving a federal

facility with a footprint that exceeds 5,000 square feet. Section 438 requires that site planning, design, construction, and maintenance strategies be implemented to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow.

National Pollution Discharge Elimination System

Under Title 40, Part 122 of the CFR, the EPA administers the National Pollutant Discharge Eliminations System (NPDES) program nationwide. Construction site operators are required to submit a Notice of Intent (NOI) to obtain coverage under EPA's Construction Stormwater General Permit if they are engaged in clearing, grading, and excavating activities that disturb one or more acres and discharge stormwater to surface waters of the state. While responsibility for issuing NPDES permits is largely promulgated to each state, because the MRS is a federal facility, the EPA rather than Ecology would issue the NPDES permit for the proposed federal action. The operator must prepare a Stormwater Pollution Prevention Plan prior to starting construction but does not need to submit it with the NOI. Project activities requiring a Construction Stormwater General Permit include ground disturbing activities, vegetation clearing, and earthwork, if these activities affect an area of at least one acre.

EPA's NPDES General Permit for Federal Aquaculture Facilities (Permit No. WAG130000) regulates discharge of pollutants in wastewaters from federal fish hatcheries to waters of the US within the boundaries of the State of Washington. The existing MRS is below the permitting thresholds for Concentrated Aquatic Animal Production (CAAP) facilities (EPA 2009) and therefore is not subject to regulation under this general permit. The EPA is proposing to reissue the permit, and public comments on the draft permit were accepted until December 22, 2022. No confirmed date for issuance of the new permit has yet been announced, and the final permit language has not been released. Once the new permit is issued, federal aquaculture facilities requiring coverage under the permit must apply for coverage within 90 days.

STATE

There are no State regulations pertaining to water resources or hydrological processes that are applicable to the Proposed Action.

LOCAL

Kitsap County Shoreline Master Program

The Shoreline Management Act is a state-mandated cooperative program of shoreline planning with local government and state responsibilities (RCW 98.58.050). Under the Act, Kitsap County adopted an SMP in 1976. An SMP is a set of policies and regulations that encourage reasonable and appropriate development of shorelines, protect the natural resources and character of the shoreline, and promotes public access (Kitsap County 2020). The SMP applies to shorelines of the state (shorelines), which are waterbodies that meet the size of flow criteria in the Shoreline Management Act. The extent of the shoreline is 200 feet from the from the ordinary high water line or high tide line and includes associated wetlands, floodways, and up to 200 feet of floodplain.

Kitsap County Critical Areas Ordinance

Under Kitsap County Critical Areas Regulations, Chapter 19.100, critical areas review is typically required to conduct work in critical areas and their buffers within unincorporated Kitsap County. Critical areas include: wetlands, fish and wildlife habitat conservation areas, geologically hazardous areas, frequently flooded areas, and critical aquifer recharge areas. As with all local permit processes, NOAA as a federal agency would comply with Kitsap County's critical areas regulations to the maximum extent practicable, as defined under the Public Buildings Amendments of 1988.

Kitsap County Stormwater Design Manual

Volume II, Chapter 2 of the County's *Stormwater Design Manual*, effective October 4, 2021 (Kitsap County 2021) provides stormwater pollution prevention measures for construction projects in Kitsap County, and is intended to be used in conjunction with Ecology's Stormwater Management Manual for Western Washington (Ecology 2019). The manual applies to construction activities that require a permit or approval from the Kitsap County Department of Community Development. As with all local permitting and regulatory processes, NOAA as a federal agency would comply with Kitsap County's stormwater guidelines to the maximum extent practicable, as defined under the Public Buildings Amendments of 1988, but would not require a County permit.

4.5.2 Affected Environment

SURFACE WATER

The region of the proposed project is drained by many small creeks and streams that predominantly flow northward and discharge into Puget Sound. Beaver Creek, is located just south of the property and runs west to east and before discharging into Clam Bay (see Figure 4.5-1). Beaver Creek supports a variety of resident fish, as well as anadromous fish species, and is classified as a Type F (fish-bearing stream under the Kitsap County Critical Areas Ordinance (see Section 4.8, Flora and Fauna for more details on fish habitat). The stream is fed by rainfall and dries up in the summer months.

An unnamed tributary to Beaver Creek flows approximately north-south through the undeveloped western portion of the MRS property, and is also classified as a Type F (fish-bearing) stream under the Kitsap County Critical Areas Ordinance. The Kitsap County Critical Areas Ordinance specifies a 150-foot stream buffer for Type F streams, within which no clearing or grading is allowed, plus an additional 15-foot building setback for structures and impervious surfaces. Existing structures within a stream buffer can be remodeled, reconstructed, or replaced in most cases.

GROUNDWATER

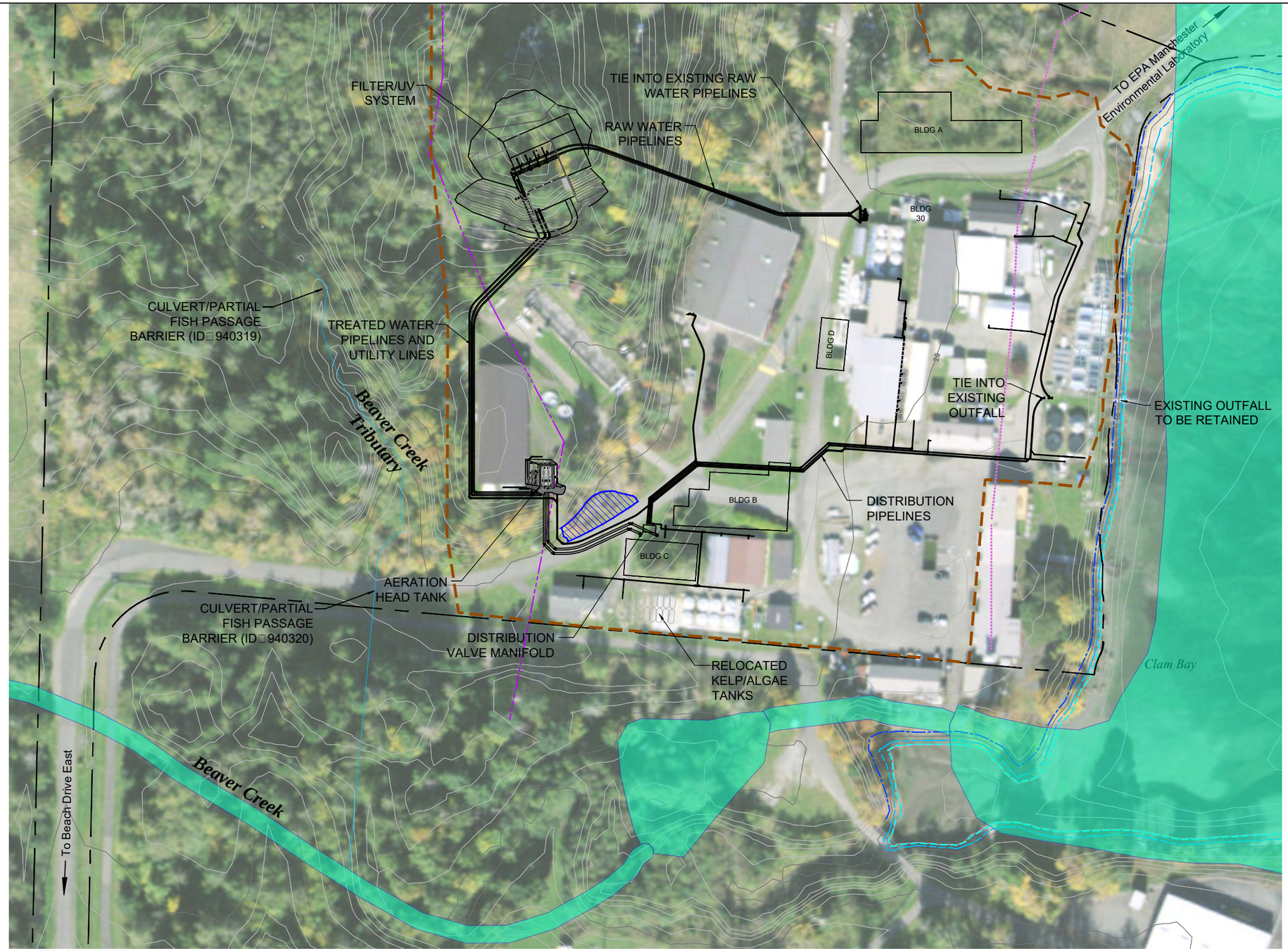
Groundwater levels in the project vicinity are highly influenced by tidal conditions. There are three groundwater zones in the vicinity of the NOAA property; the Surficial Fill Unit, the Outwash Channel Aquifer, and the Deep Proglacial Water Bearing Zone (Hart Crowser 1997).

The regional groundwater flow is to the east from upland areas toward the shoreline and Clam Bay with groundwater elevation ranging from approximately 18 feet in the northwestern corner of the site to approximately 9 feet near the shoreline, with tidal influences were observed in wells close to the shoreline (Hart Crowser 1997). A series of borings ranging from 3 to 15 feet bgs were taken in the eastern portion of the MRS in June 2021 (USACE 2022a; 2022b). Depth to groundwater in these borings ranged from 3 to 9 feet bgs in the vicinity of the main parking lot; from 1.5 to 3 feet bgs in the area between Buildings 6 and 27 and the coastline; and was 5 feet bgs in the northeast of the MRS (north of the main driveway (USACE 2022a; 2022b). Previous borings in the vicinity of Building 22 in October 2010, drilled to approximately 21 to 26 feet bgs, did not encounter groundwater, with the exception of perched groundwater noted from 3 to 4 feet depth in one of these borings (Krazan and Associates 2011). Precipitation was identified as the primary factor influencing groundwater levels at the site (Krazan and Associates 2011).

Groundwater at the site has been impacted by historical actions (prior to NOAA acquisition), as discussed further in Section 4.17.

STORMWATER

The majority of the LOD is currently occupied by permanent buildings, temporary structures, paved surfaces, landscaped surfaces, and areas of gravel and exposed soil. The northern and western portions of the LOD are heavily vegetated. Precipitation falling on the MRS is either absorbed into the ground or travels from impervious areas into catch basins in the main parking lot, or as sheet flow to gravel surfaced and grassy areas. Stormwater from these areas is eventually discharged untreated to Clam Bay by overland flow or groundwater seeps. There are no existing stormwater outfalls from the property to Clam Bay, although the catch basins in the main parking lot discharge from a pipe on the neighboring property to the south. The existing outfalls present along the coastline are associated with the existing seawater distribution system at the facility. The main seawater outfall, approximately mid-way along the coastline of the facility, drains from the ozone treatment pond and currently discharges approximately 80 percent of the total seawater discharge from the facility.



60 0 60 120

SCALE IN FEET

LEGEND

- PROPERTY BOUNDARY
- LIMITS OF DISTURBANCE
- PROPOSED ACTION COMPONENTS
- 165' CREEK SETBACK/BUFFER
- 200' SHORELINE MANAGEMENT ACT JURISDICTION
- APPROXIMATE MEAN HIGH WATER (8.2' NAVD 88)
- APPROXIMATE MEAN HIGH-HIGH WATER (9' NAVD 88)
- APPROXIMATE ASTRONOMICAL HIGHEST TIDE (11' NAVD 88)
- 2' ELEVATION CONTOURS (NAVD88)
- NATIONAL WETLAND INVENTORY WETLANDS
- FIELD IDENTIFIED WETLAND

DRAWING SOURCE: HDR.
IMAGERY SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY
CONTOURS FROM USGS NATIONAL ELEVATION DATASET, 2015.

AECOM

K:\Puget_Sound\WtD\Wetlands.dwg Mar 06, 2023 - 10:36am

WATER AND WETLAND FEATURES

NOAA NWFSC MANCHESTER RESEARCH STATION
FEBRUARY 2023 SEAWATER SYSTEM REPLACEMENT AND CAMPUS ADDITION PROJECT
60680959 MANCHESTER, WASHINGTON

FIGURE 4.5-1

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4.5.3 Environmental Consequences

PREFERRED ALTERNATIVE

Construction

Construction of the Preferred Alternative would not require any discharge of dredged or fill material into the waters of the U.S. or any work in, over, or under any navigable water of the U.S. Therefore, an Individual or Nationwide Permit under Section 404 of the Clean Water Act or a permit under Section 10 of the Rivers and Harbors Act would not be required. Because no Section 404 or Section 10 permits would be required, no water quality certification under Section 401 of the Clean Water Act would be required either. Because construction will disturb more than one acre, the project will require a NPDES Construction Stormwater General Permit.

Phase 1 construction (seawater treatment and distribution system replacement) would involve grading and excavation of approximately 22,500 square feet associated with the Filter/UV System, Aeration Head Tank, and Distribution Manifold. Trenching to install the pipe system would require temporary disturbance of an additional approximately 36,000 square feet (see Table 2-3 in Section 2.1, *Preferred Alternative*). These ground-disturbing activities could indirectly affect water resources in the project vicinity, through discharge of sediment-laden stormwater runoff, or potentially through the re-mobilization of contaminants that could potentially be present (see Section 4.17, *Hazardous Materials* for more information regarding known and potential contamination). Trenching for pipelines would require excavation up to 6 feet below ground surface for the largest pipes (24-inch diameter), with shallower trenches being required for smaller pipes. It is unclear if groundwater would be encountered during trenching and other activities associated with Phase 1 construction, but if it were, then construction dewatering would be required. If dewatering water is not appropriately handled or discharged then contaminants and soil/sediment erosion could impact stormwater quality and potentially discharge into Clam Bay.

Phase 2 construction would involve the temporary disturbance of approximately 42,000 square feet for the proposed new buildings, driveways, new or expanded foundations for relocated tanks and storage, as well as associated minor ground disturbance for utility connections (see Table 2-4 in Section 2.1.3). The exact type and depth of the building foundations would be determined during design based on site-specific geotechnical conditions, but could require drilled concrete piles to a depth of approximately 9 feet, which could potentially encounter groundwater. Similar to Phase 1 construction, these ground-disturbing activities could result in indirect impacts to stormwater or Clam Bay from sediment erosion, discharge of dewatering water, and/or remobilization of contaminated soils.

The Aeration Head Tank and a portion of the pipeline route is within the 150-foot stream buffer and additional 15-foot building setback for the unnamed tributary to Beaver Creek that flows north-south through the property. However, a forested ridge separates the LOD from the stream, and these elements of the Preferred Alternative that are within the stream buffer and building setback areas are located within existing developed areas around an existing building (Building 22). Vegetation within the LOD in these areas consists predominantly of disturbed shrub and herbaceous plant communities. Because the stream is

located on the other side of the forested ridge, potential erosion and sediment transport associated with vegetation clearing or disturbance, excavation, and grading required to construct these elements of the Preferred Alternative would have no effect on the stream. Additionally, because the LOD is predominantly within previously disturbed areas, vegetation clearing or disturbance is not anticipated to have a measurable effect on stream buffer functions. Although the County Critical Areas Ordinance does not apply to federal actions, the Preferred Alternative complies with the stream buffer and building setbacks to the extent practicable. Vegetation clearing and grading within the stream buffer, and the new pipeline and associated impervious surfaces within the additional 15-foot building setback are limited to previously disturbed areas at the toe of slope on the opposite side of the ridge, and would have no measurable effect on the stream or buffer function.

No in-water work would occur as part of the Preferred Alternative; therefore, no impacts to Clam Bay are anticipated. Assuming the best management practices and mitigation measures described in Section 4.5.4 are implemented, the impacts to water resources during construction would be *short-term and minor*.

Operation

The existing seawater intake system in Clam Bay would not be altered by the Preferred Alternative, as the new pipeline would tie into existing raw water pipelines at an upland location to the west of Building 13 at an elevation of 17 feet MSL, and no increase in intake velocity or volume is proposed. The existing intake pumps currently operate 24 hours a day and 7 days a week at a capacity of between 2,200 to 2,500 gpm and would continue to do so with operation of the Preferred Alternative.

Discharge from the proposed replacement seawater circulation system will be of a similar nature to the existing discharge in terms of water quality, as the types of laboratory research and seawater use in the new laboratories would be similar to existing research uses at the site. As previously described in Section 4.5.1, discharge from the existing outfall is not regulated under EPA's current NPDES General Permit for Federal Aquaculture Facilities (Permit No. WAG130000) since the MRS falls below the permitting thresholds for CAAP facilities (EPA 2009), and the facility would continue to fall below this existing permitting threshold even after implementation of the Preferred Alternative. Although the EPA intends to issue an updated General Permit in the near future (EPA 2023), such provisions are not yet in effect. If the MRS facility requires coverage under the future General Permit, NOAA would apply for coverage at that time and adhere to any required conditions.

The new seawater circulation system would connect to the existing main seawater discharge outfall at a location upland from Clam Bay (approximately elevation of 18 feet MSL), with no change in total discharge volume from the site. Due to the proposed consolidation of all seawater discharge via one outfall, the flow rate of water discharged from the main outfall is anticipated to increase from approximately 2,200 gpm under existing conditions, to 2,500 gpm under proposed project conditions. The velocity of discharge at the main outfall is anticipated to increase from approximately 4.9 feet per second under existing conditions to 5.6 feet per second under project conditions (Hackett, pers. comm., 2023). This minor (approximately 14 percent) increase in discharge velocity is not anticipated to substantially increase erosion of tidal sediments in the vicinity of the outfall, because the existing main outfall discharges onto an area of rip-rap/stony substrate (see Figure 4.5-2), and therefore the minor increase in

discharge velocity would not cause a substantial increase in the scour of fine sediments at the outfall. Furthermore, any potential minor increase in scour of fine sediments due to channelization of the discharge within the intertidal sediments at low tide would be offset by a decrease in channelization and scour at the other existing outfalls to be abandoned. The outfalls to be abandoned are located higher above the ground surface and some discharge onto areas of finer sediments. Therefore, consolidation of the site discharge into the main outfall is expected to result in a negligible change to erosion rates and associated turbidity or water quality issues within the intertidal area. *See Section 4.17 for further discussion relating to existing contamination at the site and within Clam Bay.*

Figure 4.5-2 Existing Discharge at Main Outfall during low tide conditions

Source: Adapted from U.S. Army Corps of Engineers, 2021. Final 2020 Data Analysis Report for Clam Tissue and Sediment Sampling (Figure 23).

The Preferred Alternative would add approximately 40,000 square feet of impervious surfaces at the site: approximately 4,100 SF from the seawater system components and approximately 35,300 SF from new building roofs, new driveway and parking areas, and associated improvements. Stormwater from these new roofs and other new impervious surfaces would be collected via proposed storm drains and would. Precipitation falling on pervious surfaces, including landscaped areas, would infiltrate into the ground. Although as a federal agency NOAA is not required to obtain local permitting approvals, stormwater design for the Preferred Alternative would comply with Volume II, Chapter 2 of the Kitsap County's *Stormwater Design Manual*, effective October 4, 2021 (Kitsap County 2021) to the maximum extent

practicable, as defined under the Public Buildings Amendments of 1988. The standards within the County's manual generally seek to conserve natural areas, retain native vegetation, reduce impervious services, integrate stormwater controls into existing drainage patterns to the extent feasible, and to use low impact development strategies. Operational impacts to water quality would be *long-term and minor*.

NO-ACTION ALTERNATIVE

Effects under the No-Action Alternative would be identical to existing operations in the near future, and would cease in the medium- to long-term; therefore, *no new impacts* to water resources would occur.

ACTION ALTERNATIVE 1

Construction

The construction-related impacts to water resources under Action Alternative 1 would be the same as described for Phase 1 of the Preferred Alternative. The impacts would be less than for the Preferred Alternative because the total area of disturbance and duration of construction would be substantially less. Furthermore, no building foundations would be excavated and no piles would be drilled; therefore, the chance of encountering groundwater or re-mobilizing contaminants would be less than for the Preferred Alternative. Action Alternative 1 would include the same work within the County's 150-foot stream buffer and additional 15-foot setback as described for the Preferred Alternative, and for the same reasons previously discussed would have no measurable effect on the stream or buffer function.

Assuming the best management practices and mitigation measures described in Section 4.5.4 are implemented, the impacts to water resources during construction of Action Alternative 1 would be *short-term and minor.*

Operation

Operational impacts to water resources from Action Alternative 1 would also be less than described for the Preferred Alternative, as the only new areas of impervious surfaces at the site would be the approximately 4,100 SF associated with the Filter/UV System, Aeration Head Tank, and Distribution Valve Manifold. Impacts would be *long-term and negligible.*

4.5.4 Mitigation Measures

PREFERRED ALTERNATIVE

The following standard BMPs and requirements would be followed during construction:

- The construction contractor would submit a Notice of Intent and prepare and implement a Construction SWPPP to avoid release of sediment and construction debris into nearby marine, estuarine, and riverine habitats (Clam Bay and Beaver Creek). The SWPPP would be prepared in accordance with EPA's Construction Stormwater General Permit, and would contain a Temporary Erosion and Sediment Control Plan and pollution prevention controls. Impact

avoidance and minimization measures and standard construction BMPs that would be included in the SWPPP are listed below:

- The number of access routes, size of staging areas, and the size of the active construction sites shall be limited to the minimum necessary to achieve project objectives and the staging, storage equipment laydown, access routes, and parking areas would be established on paved or previously disturbed areas to the extent feasible.
- Standard construction site erosion control measures such as silt fencing and covering of stockpiles shall be used where sediment from exposed slopes could erode and enter drainage facilities. Areas of disturbed soils that slope toward drainages would be stabilized when not actively used to reduce erosion potential.
- If work is conducted during the wet season October 1 through April 30, stockpiled fill materials and excavation spoils shall be covered.
- Silt fencing shall be installed around all areas of disturbed soil, stockpiled fill materials, and excavation spoils.
- A clean construction site shall be maintained to reduce the potential for debris entering surface waters. Any debris that enters the water shall be contained, removed, and disposed of at an upland location.
- The contractor shall be required to maintain construction equipment and vehicles to prevent them from leaking fuel or lubricants. Refueling shall occur in paved areas of the site, away from water bodies.
- Procedures to prevent or respond to leaks, spills, or other releases of pollutants shall be established and implemented.
- Monitoring and inspections by qualified personnel shall be undertaken to verify permit compliance. Inspections and any corrective actions shall be documented.

The following mitigation measures would be implemented:

- **Mitigation Measure 4.5-1, Maintain Pre-development Hydrology.** Site planning, design, construction, and maintenance strategies shall be implemented to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow. Design of new impervious surfaces (buildings and paved areas) shall utilize low-impact design and/or "green infrastructure" elements to avoid direct discharge of stormwater to waterbodies.
- **Mitigation Measure 4.17-1, Environmental Media Management Plan**. See Section 4.17.4 for details.

NO-ACTION ALTERNATIVE

No mitigation measures would be required under the No-Action Alternative.

ACTION ALTERNATIVE 1

The BMPs and mitigation measures for Action Alternative 1 are the same as for the Preferred Alternative.

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4.6 RECREATIONAL RESOURCES

This section describes existing recreational resources in the vicinity of the MRS and evaluates impacts of the Proposed Action on recreational resources. The study area includes recreational resources within a half-mile of the NOAA property. Recreational resources include national, state, and local parks, beaches, trails, and associated amenities that would potentially be affected by the Proposed Action. Private recreational areas and locations informally established for recreational use are also included. Factors to be considered include changes in the demand for or quality of the recreational resources potentially affected by the Proposed Action.

4.6.1 Regulatory Setting

FEDERAL

Land and Water Conservation Fund

The Land and Water Conservation Fund was established by Congress in 1964 to fulfill a bipartisan commitment to safeguard natural areas, water resources, and cultural heritage, and to provide recreation opportunities. The fund invests earnings from offshore oil and gas leasing to provide grants to state and local governments and acquire lands and waters for federal land management agencies (NPS 2022). The Land and Water Conservation Fund requires states and territories to periodically update a state comprehensive outdoor recreation plan to maintain eligibility for funds. The 2018-2022 Recreation and Conservation Plan for Washington State provides a strategic direction for how the state can assure the effective and adequate provision of outdoor recreation and conservation to meet the needs of state residents (RCO, 2022).

STATE AND LOCAL

There are no State or local regulations pertaining to recreational resources that are applicable to the Proposed Action.

4.6.2 Affected Environment

Two recreational resources are located within the study area. The closest recreational resource is Manchester State Park, which borders the NOAA property to the north. Manchester State Park is a 128-acre camping park located on a former Navy site. The park includes 1.9 miles of hiking trails, access to shoreline, and numerous locations for boating, diving, biking, and wildlife viewing within the park boundaries (WSPRC 2022). In 2021, Manchester State Park received 250,000 visitors, including 21,500 overnight campers (WSPRC 2021). A park campsite is located within approximately 100 feet to the north of the NOAA property (see Figure 4.5-1), which is open annually from April 1 to October 31 (WSPRC 2022).

South Kitsap Eastern Little League baseball fields, located at 6600 East Hilldale Road, are approximately a half-mile northwest of the NOAA property. The South Kitsap Eastern Little League is a private

organization that maintains five baseball fields and a concession stand for youth sports at the site (SKELL 2022).

4.6.3 Environmental Consequences

PREFERRED ALTERNATIVE

Construction

The Preferred Alternative would require the installation of a new seawater treatment and distribution system and the construction of four new buildings. Construction and installation would require delivery of equipment and materials. Construction-related vehicles would utilize the existing site access to MRS from Beach Drive East. Beach Drive East is also used to access Manchester State Park and South Kitsap Eastern Little League baseball fields. However, traffic levels on Beach Drive East are low (see Section 4.14, *Transportation*) and all recreational resources within the vicinity would remain accessible during construction using existing access routes. Construction activities would not directly impact recreational facilities and would not impede or obstruct access to recreational resources.

The campground at the State Park is approximately 100 feet from the proposed construction area associated with the Filter/UV System. Construction noise from activities that occur between April and October would be perceptible to campers at the Manchester State Park campground, which would potentially detract from the camping experience. As discussed in Section 4.13, *Noise*, Phase 1 construction may generate noise levels of up to 75 A-weighted decibel (dBA) at the campground. However, Manchester State Park is shielded from the construction site by thick vegetation, which would serve to dissipate construction noise such that the noise levels experienced at the campground would be lower than the values calculated in Section 4.13. Furthermore, construction activities would generally be limited to hours between 7:00 a.m. and 10:00 p.m. on weekdays when the park generally has fewer visitors, and therefore would not disturb campers during normal sleeping hours, except for the occasional early start that may be required. Noise impacts are discussed further in Section 4.13. To minimize potential noise impacts on the nearby campground, NWFSC would notify Manchester State Park about construction activities planned to occur between April and October so that the State Park can provide advance notice to visitors of potential disruptions (see Mitigation Measure 4.13-2 in Section 4.13). Most hiking trails in Manchester State Park are in the northern portion of the park, approximately 1,800 feet from MRS; therefore, it is not anticipated that hikers would be disturbed by construction noise.

During the construction of the Preferred Alternative, elevated levels of air emissions may occur due to fugitive dust. Fugitive dust could impact air quality at park locations closest to construction, such as the campground; however, fugitive dust reduction practices would be implemented to prevent dust emissions from traveling beyond the work site. Fugitive dust impacts are discussed further in Section 4.4, *Air Quality.*

Overall, construction of the Preferred Alternative would have a *short term, minor impact* on recreational resources.

Operation

Operation of the Preferred Alternative would not result in loud off-site noise, fugitive dust emissions, or substantial new traffic that would affect users of nearby recreational facilities. Operations under the Preferred Alternative would be similar to existing, with only slight increase in the number of employees and visitors to the site. As discussed in other sections of this EA, impacts such as traffic and noise from operational activities at the site would not be significant and are not anticipated to be noticeable to users of nearby recreational facilities. Additionally, the minor increase in employees would not create a noticeable increase in demand for local recreational facilities. Therefore, operation of the Preferred Alternative would have *no impacts* on recreational resources.

NO-ACTION ALTERNATIVE

The No-Action Alternative assumes that the existing facilities and seawater treatment and distribution system would be left in place and current site operations would continue until such time as the existing seawater system fails. There would be no changes at the site and no increase in employees or visitors in the short term. In the long-term, the number of employees and visitors would decrease. No impacts to recreational resources would occur under the No-Action Alternative.

ACTION ALTERNATIVE 1

Construction

Action Alternative 1 would only require the installation of a new seawater treatment and distribution system. No new buildings would be constructed. The installation of the new seawater treatment and distribution system would potentially generate construction noise perceptible to campers in Manchester State Park, similar to that described for the Preferred Alternative; however, the impacts would be shorter in duration than impacts from the Preferred Alternative (i.e., 12 months instead of 24 months). As described for the Preferred Alternative, fugitive dust from construction activities is not anticipated to adversely affect campers due to the thick vegetation between the two sites and standard dust control measures that would be implemented during construction. Therefore, proposed construction under Action Alternative 1 would have a *minor, temporary impact* to recreational resources.

Operation

Operation of Action Alternative 1 would be the same as existing conditions, with no increase in employees or visitors to the site, and no new sources of operational noise, traffic, or fugitive dust emissions that could impact adjacent recreational facilities. Therefore, operation of Action Alternative 1 would have *no impact* on recreational resources.

4.6.4 Mitigation Measures

PREFERRED ALTERNATIVE

The following mitigation measures would be implemented:

- **Mitigation Measure 4.13-2: Preconstruction coordination and notification**. See Section 4.13.4 for details.

NO-ACTION ALTERNATIVE

No mitigation measures would be required under the No-Action Alternative.

ACTION ALTERNATIVE 1

The mitigation measures for Action Alternative 1 are the same as for the Preferred Alternative.

4.7 CULTURAL RESOURCES

This section describes existing conditions relating to cultural resources and evaluates impacts of the Proposed Action to such resources. For the purposes of this EA, cultural resources are buildings, sites, structures, objects, districts, artifacts, and landscapes that are considered to have historical or cultural value. Hence, cultural resources include resources that may not have been evaluated yet for inclusion in the NRHP. Under NEPA, impacts to all types of cultural resources are considered regardless of their NRHP status. Cultural resources can include, but are not limited to:

- Historic Properties, defined as "any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP maintained by the Secretary of the Interior. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the NRHP criteria" (36 CFR 800.16), and as used in Section 106 of the National Historic Preservation Act (NHPA).
- Native American cultural items such as human remains, funerary items, sacred objects, and objects of cultural patrimony.
- Archaeological resources, which include pre-contact (i.e., dating to the period in North America predating the arrival of Euro-Americans) and historic-era (dating from the post-contact era) archaeological sites, as well as historic-era standing buildings, structures, and objects.
- Cultural uses of the natural environment, such as ceremonial or other religious use of places, plants, animals, and minerals. These types of resources can include Native American sacred sites that may or may not be considered as Traditional Cultural Properties, cultural landscapes, ethnographic landscapes, and historic landscapes.

4.7.1 Regulatory Setting

FEDERAL

National Historic Preservation Act

Separate from NEPA, NOAA must comply with Section 106 of the NHPA (16 USC Section 470) and its implementing regulations (36 CFR 800). These regulations require federal agencies to consider the effects of their actions on historic properties. The regulations require federal agencies to identify historic properties within an Area of Potential Effects (APE), determine if an undertaking will constitute an adverse effect to identified historic properties, and seek to resolve any adverse effects.

Cultural Resources that have not been evaluated for inclusion in the NRHP are evaluated using criteria listed in 36 CFR 60. Cultural Resources can be determined eligible for inclusion in the NRHP if they possess integrity, the capacity to convey their significant historic associations, and meet one of four criteria listed in Title 36, CFR 60:

> *The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess*

integrity of location, design, setting, materials, workmanship, feeling, and association and:

(a) are associated with events that have made a significant contribution to the broad patterns of our history; or

(b) are associated with the lives or persons significant in our past; or

(c) embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

(d) have yielded, or may be likely to yield, information important in prehistory and history.

Cultural resources are typically evaluated for inclusion in the NRHP if they are at least 50 years old, or if the resources have achieved significance within the past 50 years. If NRHP-eligible resources are identified, then federal agencies are directed to take prudent and feasible measures to avoid or minimize adverse effects, and to afford the Advisory Council on Historic Preservation, consulting parties, and the public an opportunity to comment on potential effects to historic properties.

Other Federal Laws

Numerous other laws, regulations, and EOs protect cultural resources. The American Indian Religious Freedom Act of 1978 (42 USC Section 1996) requires that federal agencies consider the effects of their actions on cultural resources that are of religious significance to Native Americans and Alaska Natives. Native American and Alaska Native graves, burial grounds, and associated funerary objects on federally managed lands are protected by the Native American Graves Protection and Repatriation Act (25 USC Sections 3001-3013).

EO 13007: Indian Sacred Sites

EO 13007: Indian Sacred Sites of 1996 directs federal agencies to allow Native Americans to worship at sacred sites located on federal property and to avoid adversely affecting such sites to the extent practicable. The Antiquities Act of 1906 (16 USC Section 431) establishes penalties for damage and destruction of antiquities and allows for designation of historic landmarks on federal lands. The Archaeological Resources Protection Act of 1979 (16 USC Section 470) establishes a permit process on public and Native American lands, and provides penalties for violations and damages to archaeological sites. EO 13287-Preserve America directs federal agencies to build partnerships with local governments, Indian tribes, and the private sector to preserve cultural resources, and improve the stewardship of cultural resources.

STATE

Indian Graves and Records (RCW 27.44)

Washington state law protects Native American graves and burial grounds, encourages voluntary reporting of these sites when discovered, and mandates a penalty for disturbance or desecration of such sites.

Archaeological Sites and Resources (RCW 27.53)

RCW 27.53 governs the protection and preservation of archaeological sites and resources and establishes the Washington Department of Archaeology and Historic Preservation (DAHP) as the administering agency for these regulations.

Abandoned and Historic Cemeteries and Historic Graves (RCW 68.60)

RCW 68.60 protects and preserves abandoned and historic cemeteries, historic graves, and skeletal human remains.

Shoreline Management Act (RCW 90.58)

The SMA provides a statewide framework for managing, accessing, and protecting Washington's significant shorelines (e.g., rivers, lakes, and coastal waters), including the consideration of significant cultural resources in these areas.

LOCAL

There are no local regulations pertaining to cultural resources that are applicable to the Proposed Action.

4.7.2 Affected Environment

The purpose of this section is to describe cultural resources within the APE, which is a geographic area that may be directly or indirectly affected by the Proposed Action, and therefore, comprises the affected environment for cultural resources. Effects could be the direct result of ground disturbances (direct), visible or audible disturbances, or changes in public access, visual intrusions, traffic patterns, or land use (indirect) as a result of the Proposed Action.

Information presented herein is based on a review of data on file at the restricted-access Washington Information System for Architectural and Archaeological Records Data (WISAARD) managed by DAHP and the results of a Cultural Resources Assessment, including subsurface shovel probing, performed July 2022 (AECOM 2022). The restricted-access, searchable Geographic Information System database depicts locations of previously recorded archaeological sites, cultural resource surveys conducted after 1995, NRHP properties, Washington Heritage Register resources, Heritage Barn Register resources, and cemeteries. A variety of historic maps and aerial photographs were also reviewed, as well as data publicly available on the internet.

AREA OF POTENTIAL EFFECTS

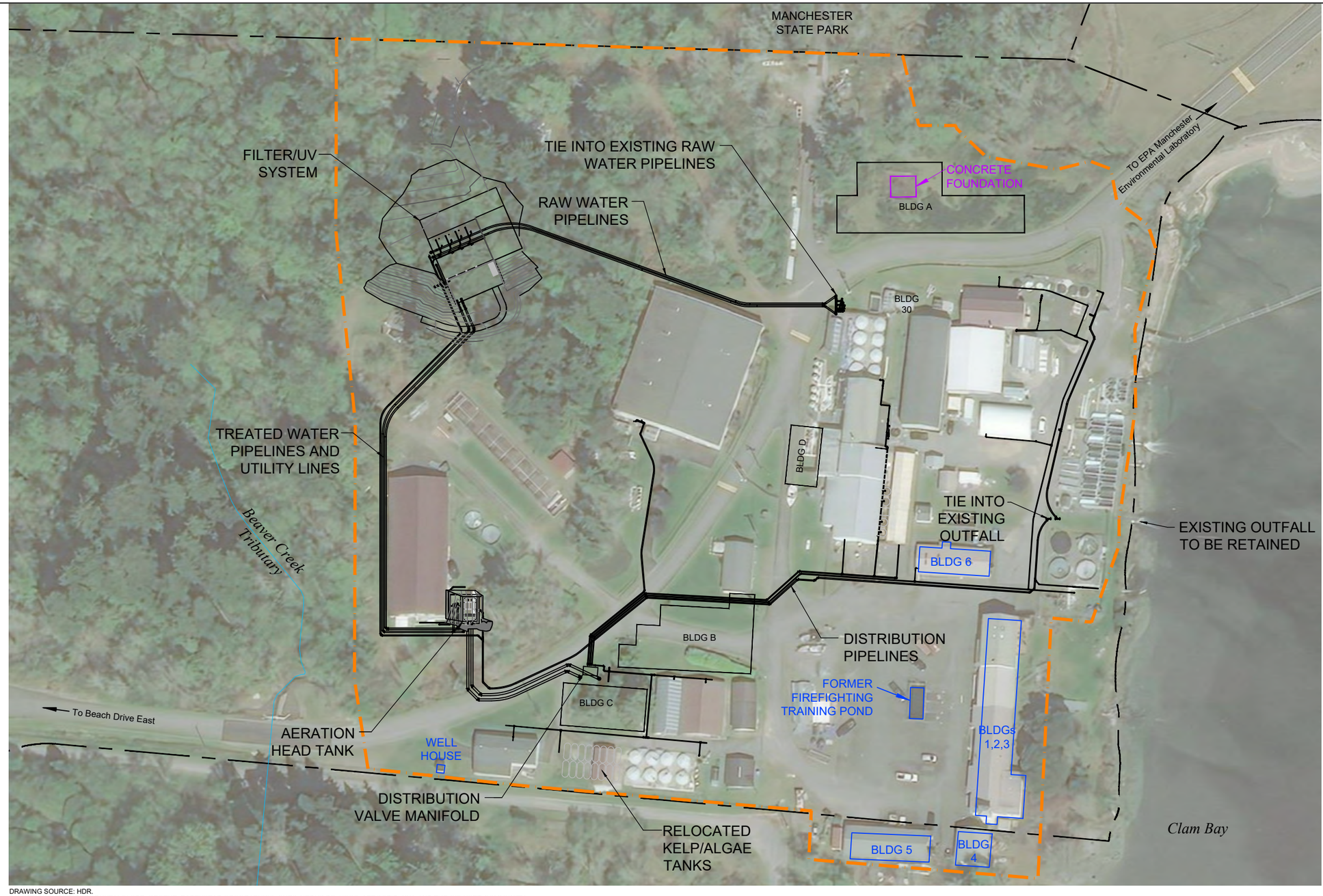
The APE describes the areal extent of where potential direct and indirect impacts to cultural resources could occur as a result of the Preferred Alternative. The APE for the Preferred Alternative, which defines the Affected Environment, is shown on Figure 4.7-1. The APE includes areas that could be directly affected by the Proposed Action (i.e., the LOD, where temporary disturbance could occur or permanent structures could be installed) as well as nearby areas that could be indirectly affected by the Proposed Action (e.g., through impacts to the visual setting). The direct APE includes more than 30 buildings and dozens of structures but only four were constructed prior to 1987. These historic-age resources are comprised of the World War II-era building and structures consisting of Building 1 2 3, Building 6, Well House, and the (former) Firefighting Training Pond. The indirect APE is intended to encompass effects on landscapes and viewsheds. From the literature reviewed, there has been no historic viewshed interest, and given that project area was formerly a Navy training facility that has been dramatically altered, the proposed installation of a new seawater treatment and distribution system to replace the existing system, as well as construction of four new buildings would not substantively affect the existing historic setting. However, the indirect APE includes two additional World War II-era buildings (Buildings 4 and 5) which are not located on the MRS property but were part of the original Navy training facility. The DAHP concurred with the APE for the Proposed Action on October 12, 2022 (DAHP 2022, see Appendix A-1).

PRECONTACT CONTEXT

Around 10,000 years ago, as the last Pleistocene glaciers retreated, ice sheets melted and sea levels rose, and landforms in the area became available for human settlement. Generally, archaeological sites along the Northwest Coast dating from the Archaic period from about 10,000 to 5,000 years ago are rare (Ames and Maschner 1999). Artifacts from Archaic period sites, variously called the "Old Cordilleran," "Lithic," or "Olcott" phase, include leaf-shaped projectile points and cobble tools that reflect an adaption to near-shoreline terrestrial mammal hunting and littoral gathering (Nelson 1990). Although these early sites provide evidence for use of maritime resources, they do not indicate permanent adaptation to coastal environments.

During the early and middle Holocene, sea levels began to stabilize and evidence for occupation of the region includes archaeological sites in upland settings in the Puget basin and Strait of Juan de Fuca. This period is referred to as the Early period and dates from approximately 8,000 BP to 5,000 BP. Artifact assemblages found in the Puget Lowlands during this period are called Olcott and are characterized by large leaf-shaped and stemmed points, scrapers, and cobble tools (Carlson 1990).

The Middle period dates from approximately 5,000 BP to 2,500 BP and is characterized by increased population density across western Washington and socio-economic complexity. The subsistence economy included a diversity of marine and riverine resources, which became more accessible as a result of sea-level stabilization. Ground stone implements, as well as bone and antler tools, appear in both coastal and inland sites after 5,000 BP (Ames and Maschner 1999).



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SCALE IN FEET

LEGEND

- PROPERTY BOUNDARY
- AREA OF POTENTIAL EFFECT
- PROPOSED ACTION COMPONENTS
- ARCHEOLOGICAL RESOURCE (NON-ELIGIBLE)
- BUILT-ENVIRONMENT RESOURCE (NON-ELIGIBLE)

DRAWING SOURCE: HDR.
IMAGERY SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

K:\Puget_Sound\WKD\APE.dwg Mar 06, 2023 - 10:38am

AECOM

AREA OF POTENTIAL EFFECT

NOAA NWFSC MANCHESTER RESEARCH STATION
NOVEMBER 2022 SEAWATER SYSTEM REPLACEMENT AND CAMPUS ADDITION PROJECT
60680959 MANCHESTER, WASHINGTON

FIGURE 4.7-1

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The Late period dates from approximately 2,500 BP to Euro-American contact in the early nineteenth century. The period is characterized by full-scale development of marine-oriented cultures on the Pacific coast, a mixed marine and terrestrial economy along the shores of Puget Sound, and inland terrestrial mammal and riverine fishing (Ames and Maschner 1999; Miss et al. 2008). Communities congregated at river confluences and along tidewater shorelines in permanent or semi-permanent winter villages, and cedar plank houses are well-represented in the archaeological record (Ames and Maschner 1999).

Site types reflecting precontact use of the Project Area could include seasonal camps, lithic scatters, fishing stations, or food processing. Archaeological materials could include stone, shell, bone, and antler tools; dentalium shells; fishing wiers; basketry; rock concentrations; post molds; masses of marine shell; fire pits/hearths; or other materials.

ETHNOGRAPHIC CONTEXT

The MRS and its vicinity lies in the heartland of the Suquamish People, the suq'^{w}abš, who represent but one of over 50 Southern Coast Salish tribal groups that traditionally frequented the Puget Sound Basin (Suttles and Lane 1990). The Suquamish, whose name is said to mean "place of the clear salt water" generally, resided on Kitsap Peninsula from near the mouth of Hood Canal south to Vashon Island and included Bainbridge Island, Blake Island, and the west side of Whidbey Island. They also resided on lands surrounding Port Ludlow, Hansville, and Silverdale. Summer villages further afield included Indian Island at the southern tip of Port Townsend Bay and Quilcene on the opposite shore of Hood Canal, and Belfair. The prominently known winter village, known as Old Man House, was home to Chief Seattle and Chief Kitsap and was located in the area of present-day Seattle, across Puget Sound from the MRS and Clam Bay.

The Suquamish traveled to gather and trade with other neighboring Native American peoples; for example the area near Elliot Point, a well-known gathering place north of present-day Seattle, likely witnessed interactions between the Suquamish and neighboring Native American peoples. These groups included the Snoqualmie who lived inland and upstream along the Snohomish and Snoqualmie Rivers and their tributaries; the Snohomish, who traditionally occupied northern Kitsap peninsula and the Mukilteo area; the Duwamish, who lived further south near present-day Seattle and the Duwamish River valley; and the Swinomish, Lummi, Skagit, and other tribal communities living on the islands and mainland to the north (Miss et al. 2008).

The suq'^{w}abš have an economic system focused heavily on marine resources, with ethnographic and historic period villages, camps, shellfish gathering localities, and fishing stations along the marine littoral of Kitsap County, including Clam Bay, at which the MRS is located. Suquamish Ancestors intensively used the shoreline of Clam Bay, Little Clam Bay, and Rich Passage. Four pre-contact archaeological sites have been recorded in the project area vicinity and Suquamish Elders identified a multi-season camp site south of the project area that was used to fish, hunt, collect plant resources, and collect shellfish (Hilbert et al. 2001; Lane 1974). The project area has a high probability for unrecorded archaeological deposits in locations that have not been disturbed by previous construction and remediation activities.

HISTORIC CONTEXT

During the nineteenth century, the area's Euro-American settlement was shaped by the Donation Land Claim Act of 1850, the Homestead Act of 1862, and former Hudson Bay Company employees who populated the Pacific Northwest (Emerson 2012). Development of the project area is characterized by the actions of the U.S. War Department in the late nineteenth and early twentieth centuries, the U.S. Navy during World War II, and U.S. Fish and Wildlife Service (USFWS) and NOAA during the post-World War II era. The project area is located within a larger government property historically known by several names including Battery Mitchell (Middle Point), Puget Sound Naval Shipyard Annex, Manchester Annex, Naval Fuel Depot, Old Navy Dump, and Manchester Research Facility.

PREVIOUS CULTURAL RESOURCES INVESTIGATIONS

According to WISAARD, archaeological monitoring was conducted within the APE during construction of a pole building (Lahren 2011) and three cultural resource inventories have been conducted within one mile of the APE. Expanding the records search to two miles resulted in a wider sample of cultural resource inventories. These previous studies were undertaken as compliance-related projects. One prior investigation (Stutzman 1995) was conducted for the U.S. Navy near the project area and two investigations were conducted for improvements at the Port of Manchester (Berger and Hartmann 2009; Norman 1999).

The project area does not contain nor overlap with any historic properties eligible for listing in the NRHP. Archaeological monitoring for construction of a pole building (Lahren 2011) within the APE did not yield any cultural resources; however, a cultural survey within the adjacent Manchester Fuel Depot resulted in the identification of two precontact sites and a multiple component site (Stutzman 1995).

PREVIOUSLY RECORDED ARCHAEOLOGICAL RESOURCES

According to WISAARD, no archaeological sites have been documented within the APE. The following three archaeological sites have been previously recorded within one mile of the APE and are located along the shore of Little Clam Bay within the U.S. Navy's Manchester Fuel Depot (Stutzman 1995):

- Site 45KP117, the closest site to the APE (0.25 mile), consists of a diffuse scatter of fire cracked rock (FCR), two pieces of lithic debitage, and a modified cobble.
- Site 45KP118 is a multi-component site composed of bottle fragments, a metal spike, 15 pieces of FCR, and two basalt flakes.
- Site 45KP119 consists of 20 pieces of FCR, two basalt flakes, and a bifacially modified cobble.

PREVIOUSLY RECORDED BUILT ENVIRONMENT RESOURCES

According to WISAARD, no built environment resources have been documented within the APE. Within 0.5 miles of the APE, 29 historic-era built environment resources were identified. Of those, the Fort Ward Historic District and Expansion is listed in the NRHP. Three built environment resources have been determined eligible or potentially eligible and include Middle Point Torpedo Storehouse, Middle Point

Command Post, and Manchester State Park-Former Torpedo Storehouse, Middle Point. All other built environment resources were evaluated as Not Eligible or Undetermined.

INVENTORY RESULTS

A cultural resources inventory, consisting of background research and archaeological and built environment field surveys, were conducted within the APE (AECOM 2022). The field surveys resulted in the identification of 7 cultural resources including 1 newly recorded archaeological site and 6 newly recorded built environment resources.

The newly recorded archaeological site is a historic-period archaeological site comprising a concrete foundation (a remnant of the former U.S. Navy northern fire training simulator building) in the northeast of the APE (see Figure 4.7-1). The site is lacking any associated artifacts and is recommended as not eligible for NRHP-listing. As part of the archaeological field survey, a total of 15 shovel test probes were excavated within the APE; no archaeological deposits were identified, and soils exhibited varying levels of previous ground disturbance.

The six newly recorded built environment resources include Building 1, 2, 3, Building 4, Building 5, Building 6, the Firefighting Training Pond, and the Well House, all of which are near the southeast corner of the APE (see Figure 4.7-1). These six resources were evaluated individually for the NRHP, and were also evaluated for the NRHP as a historic district comprising the NOAA NMFS Manchester Research Station. The structures themselves and the research station as a historic district were both recommended as not eligible for listing in the NRHP.

The cultural resources inventory (AECOM 2022), which includes the findings and recommendations of the archaeological and built environment field surveys, has been submitted to the DAHP. DAHP concurred with the finding of no historic properties affected on March 22, 2023 (see Appendix A-1).

4.7.3 Environmental Consequences

PREFERRED ALTERNATIVE

The six historic-age built-environment resources were evaluated for the NRHP, both individually and as a potential historic district, and were recommended as not eligible for listing in the NRHP (AECOM 2022). If DAHP concurs with this recommendation, there would be *no impact* to built-environment historic properties from construction or operation of the Preferred Alternative.

No archaeological remains were found during subsurface shovel probing within the APE. A single concrete foundation (shown on Figure 4.7-1) was documented as an archaeological site and is recommended as not eligible for NRHP-listing (AECOM 2022). If DAHP concurs with this recommendation, there would be *no impact* to identified or known significant archaeological resources from construction activity (including removal of the concrete foundation).

There is a low likelihood of encountering previously unidentified archaeological resources during construction activity. Although the majority of the APE is largely disturbed and the potential for

encountering intact archaeological resources is generally low; construction of some components (e.g., pipeline trenching and excavation for equipment pads or building foundations) could encounter undisturbed native soil. If excavated soil contains artifacts that appear to have potential archaeological significance, it would be treated as a potential NRHP-eligible resource and further notifications and consultations with Tribes and DAHP would occur to determine the most appropriate management. However, archaeological resources are neither known nor considered highly likely to be present; and therefore, with implementation of standard protocols for inadvertent discoveries the Preferred Alternative would have a *negligible to no impact* on previously unidentified archaeological resources.

NO-ACTION ALTERNATIVE

Under the No-Action Alternative, the existing facilities and seawater treatment and distribution system would be left in place and the MRS would continue site operations as currently undertaken for as long as feasible. The existing seawater treatment and distribution system is anticipated to eventually fail, which would require NOAA to cease all seawater-dependent research activities at the station. In the long-term, future ground-disturbing or demolition activities could occur; however, the effects of such potential future activities cannot be determined at this time without speculation. However, given the lack of historic properties in the APE and the low potential for encountering as-yet undiscovered archaeological resources, the impact of the No-Action Alternative would be *negligible to no impact.* If any currently unplanned activities happen in the future and are found to potentially affect historic properties or archaeological resources, they would be subject to the review requirements under Section 106 of the NHPA.

ACTION ALTERNATIVE 1

As discussed previously, there are no known historical properties or archaeological resources within the APE that are eligible for NRHP-listing, and no archaeological remains were found during subsurface shovel probing (AECOM 2022). Under Action Alternative 1, the proposed replacement seawater treatment and distribution system would be installed at the site, exactly as described for the Preferred Alternative. However, no new buildings would be constructed, and no changes to the on-site roadways or landscaping would occur. Therefore, the likelihood of encountering as yet unrecorded subsurface precontact and historic period archaeological resources at the site would be even lower than for the Preferred Alternative, due to the reduced area of ground disturbance, but could still be possible. Alternative 1 would therefore have a *negligible to no impact* on cultural resources and would be less than under the Preferred Alternative.

4.7.4 Mitigation Measures

PREFERRED ALTERNATIVE

No mitigation measures are proposed for impacts associated with cultural resources.

The following standard protocols for inadvertent discoveries—if encountered—would be followed, in consultation with DAHP:

- If, during excavation or other construction activities, any previously unidentified or unanticipated historical, archaeological, and cultural resources are discovered or found, activities that may damage or alter such resources will be suspended within 100 feet of the find. Resources include, but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rock or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, immediately notify the NOAA Contracting Officer so that the appropriate authorities and/or tribal representatives and other interested parties as appropriate may be notified and a determination made as to their significance and what, if any, special disposition of the finds should be made, consistent with 36 CFR 800.13. Secure the area and prevent employees or other persons from trespassing on, removing, or otherwise disturbing such resources. If the find is a human remain, the provisions of the Native American Graves Protection and Repatriation Act (NAGPRA) shall be followed (43 CFR Part 10).

NO-ACTION ALTERNATIVE

No mitigation measures are required for the No-Action Alternative in relation to cultural resources.

ACTION ALTERNATIVE 1

No mitigation measures are proposed for impacts associated with cultural resources.

The BMPs for cultural resources for Action Alternative 1 are the same as for the Preferred Alternative.

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4.8 FLORA AND FAUNA

This section describes existing flora and fauna and evaluates impacts of the Proposed Action on these resources, which is predominantly through loss or alteration of vegetation/habitat and noise/human disturbance. The analysis of flora considers vegetation communities on the MRS property, special status plant species, and noxious weeds. The analysis of fauna considers terrestrial wildlife species, fish, and other aquatic organisms. Marine mammals are also discussed briefly because the MRS is located on marine waters. However, as the Proposed Action does not include work below HHW it is not anticipated to affect marine habitats or species.

4.8.1 Regulatory Setting

FEDERAL

Endangered Species Act. 1973 (16 USC 1531-1544, as amended)

Federally listed threatened and endangered species are those listed for protection under the federal Endangered Species Act (ESA). The U.S. Fish and Wildlife Service (USFWS) and the NMFS jointly administer the ESA and are also responsible for the listing of species (i.e., the labeling of a species as either threatened or endangered). The USFWS has the primary management responsibility for terrestrial and freshwater species, while NMFS has primary responsibility for marine species and anadromous fish species (species that migrate from saltwater to freshwater to spawn). The ESA allows the designation of geographic areas as critical habitat for threatened and endangered species as well as the protection from "take." The ESA defines to "take" as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Section 7(a)(2) of the ESA requires federal agencies to consult with USFWS and NMFS to ensure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat of such a species.

Because no ESA-listed species or their habitat are known to occur in the proposed development areas and no ESA critical habitat is present within the limits of disturbance, formal consultation under Section 7 of the ESA is not required for this proposed action.

Magnuson-Stevens Fishery Conservation Management Act 1976 (Public Law 94-265, as amended)

The Magnuson-Stevens Fishery Conservation Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires that regional Fishery Management Councils, through federal Fishery Management Plans, describe and identify Essential Fish Habitat (EFH) for each federally managed species; minimize, to the extent practicable, adverse effects on such habitat caused by fishing; and identify other actions to encourage the conservation and enhancement of such habitats. Congress defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (16 USC 1802[10]). The term "fish" is defined in the Magnuson-Stevens Fishery Conservation Management Act as "finfish, mollusks, crustaceans, and all other forms of marine animals and plant life other than marine mammals and birds." The regulations for implementing EFH clarify that

"waters" include all aquatic areas and their biological, chemical, and physical properties, while "substrate" includes the associated biological communities that make these areas suitable fish habitats (50 CFR 600.10). Habitats used at any time during a species' life cycle (i.e., during at least one of its life stages) must be accounted for when describing and identifying EFH (NMFS 2002).

Marine Mammal Protection Act (MMPA). Title I. 1972. 16 USC 1361-1389, 16 USC 1401-1407, 1411-1417, and 1421-1421h, as amended

The MMPA of 1972 established, with limited exceptions, a moratorium on the "taking" of marine mammals in waters or on lands under U.S. jurisdiction. To "take," as defined in Section 3 of the MMPA, is "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture, or kill" any marine mammal. "Harassment" was further defined in the 1994 amendments to the MMPA, which provided two levels of "harassment," Level A (potential injury) and Level B (potential behavioral disturbance).

Section 101(a) (5) of the MMPA directs the Secretary of the Department of Commerce to allow, upon request, the incidental (but not intentional) taking of marine mammals by U.S. citizens who engage in a specified activity (exclusive of commercial fishing), if the taking will have a negligible impact on the species stock and will not have an immitigable adverse impact on the availability of such species or stock for taking for subsistence uses.

Migratory Bird Treaty Act. 1918 (16 USC 703-712, as amended)

The Migratory Bird Treaty Act (MBTA) of 1918 is the primary U.S. legislation established to protect migratory birds. Migratory birds are any species or family of birds that live, reproduce, or migrate within or across international borders at some point during their annual lifecycle. The Migratory Bird Treaty Act protects and prohibits the "take" of over 800 species of birds, their nests, or their eggs. 50 CFR 10.12 defines to "take" as to pursue, hunt, shoot, wound, kill, trap, capture, or collect migratory birds, or to attempt to do so, unless permitted by regulation. Under the current interpretation of the law (USFWS 2021a), both intentional and incidental take are prohibited under the MBTA.

Bald and Golden Eagle Protection Act 1940 (16 USC 668a-d, as amended)

The bald eagle (*Haliaeetus leucocephalus*) and golden eagle (*Aquila chrysaetos*) are afforded federal protection by the Bald and Golden Eagle Protection Act. This law prohibits anyone from taking, possessing, or transporting a bald eagle or golden eagle, or the parts, nests, or eggs of such birds, without prior authorization. This includes inactive nests as well as active nests. To "take" means to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, or disturb. To "disturb" means to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available: (1) injury to an eagle; (2) a decrease in its productivity, by substantially interfering with the normal breeding, feeding, or sheltering behavior; or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.

STATE

State regulations that pertain to protection of flora and fauna through state agencies are not applicable to federally managed lands. While there are no state regulations tied to priority habitats and species (WDFW) or priority species and ecosystems (WNHP), the state regards these data sources as the best available science for planning purposes.

LOCAL

Kitsap County Critical Areas Ordinance

Under Kitsap County Critical Areas Regulations, Chapter 19.100, critical areas review is typically required to conduct work in critical areas and their buffers within unincorporated Kitsap County. Critical areas include: wetlands, fish and wildlife habitat conservation areas, geologically hazardous areas, frequently flooded areas, and critical aquifer recharge areas. As with all local permit processes, NOAA as a federal agency would comply with Kitsap County's critical areas regulations to the maximum extent practicable, in accordance with the federal consistency provision of the Coastal Zone Management Act.

Fish and Wildlife Conservation Areas are areas associated with priority species and habitats (as defined by WDFW), as well as riparian habitats along flowing rivers and streams.

4.8.2 Affected Environment

A field reconnaissance of the NOAA property and vicinity was conducted on July 14, 2022. The field reconnaissance included an assessment of plant communities; fish and wildlife habitats; potential special status species and associated habitats; and noxious weeds within the study area. The study area for the analysis in this section is the approximately 11-acre LOD which includes the anticipated permanent project footprint as well as temporary disturbance areas such as tree trimming, trenching and excavations, and potential staging areas. However, information about the larger project vicinity has been included where it is pertinent to the analysis of impacts from the proposed project, particularly for fish and wildlife that may occur in the project vicinity and be exposed to noise and other disturbances.

HABITATS

Historically, the project vicinity included conifer forests typical of the western hemlock (*Tsuga heterophylla*) forest zone in the Puget Sound lowlands (Franklin and Dyrness 1988). Most of these native conifer forests have been converted to residential, industrial, and commercial areas. The MRS property itself, as shown in Figure 2.1-5, is predominantly developed land that includes buildings, other structures, roads, parking lots, and other associated paved areas, and mowed grass and landscaped vegetation. However, the limits of disturbance also include some undeveloped forest habitat that would be converted to development under the Preferred Alternative. Dominant species observed in the forested areas of the MRS property are Douglas-fir (*Pseudotsuga menziesii*) and bigleaf maple (*Acer macrophyllum*), with western redcedar (*Thuja plicata*) and grand fir (*Abies grandis*), low Oregon-grape (*Mahonia nervosa*), western swordfern (*Polystichum munitum*), and hairy honeysuckle (*Lonicera hispidula*) observed in the

understory and herbaceous layer. A more complete discussion of plant species present in project disturbance areas is presented in the following section (*Plants*).

During the July 14, 2022 site reconnaissance, a small (approximately 2,600-SF) scrub-shrub/emergent wetland was identified within the LOD, north of the main access road and across from proposed Building C (see Figure 4.5-1 and Section 4.9 *Wetlands*). No streams were observed within the LOD. South of the MRS on adjacent property, Beaver Creek flows east-west and discharges into the estuarine habitats in Clam Bay and an unnamed tributary flows approximately north-south in the undeveloped western portion of the MRS. A culvert west of the LOD (WDFW Site ID #940320, see Figure 4.5-1) that carries the unnamed tributary underneath the main access road to the MRS is considered to be a partial fish passage barrier (WDFW 2011). Upstream of the main access road, the tributary flows through an additional culvert (WDFW Site ID #940319, see Figure 4.5-1) under a dirt road on the MRS property; this culvert is also considered to be partial fish passage barrier (WDFW 2008). Beaver Creek and its tributary, as well as their associated instream and undeveloped riparian habitats, are outside the LOD and will not be adversely impacted by the project.

The larger project vicinity includes adjacent marine nearshore habitat in Clam Bay to the east. Intertidal estuarine/marine wetlands occur in the shoreline areas of the MRS, outside of the LOD. As discussed in more detail in Section 4.17, *Hazardous Materials,* the MRS and parts of Clam Bay adjacent to it are part of a former EPA Superfund site from which contaminated sediments were removed and replaced with clean fill (NOAA 2010). The bay supports aquatic vegetation, including eelgrass (*Zostera marina*), soft brown kelps, and other macroalgae (*Sargassum muticum*, *Ulva* sp., red algae) (DNR 2022). Undeveloped forested habitat occurs to the north, west, and south of the LOD. These adjacent forested habitats occur as small blocks that are fragmented by roads and other development in the area.

The estuarine and marine wetland at Clam Bay and the mouth of Beaver Creek is considered a priority habitat by WDFW (2022a). No other priority habitats are mapped in the project vicinity, although Beaver Creek provides habitat for priority fish species (See *Fish and Other Aquatic Organisms*, below).

PLANTS

Vegetation

Table 4-1 provides a summary of vascular plant species that were observed in proposed temporary disturbance areas for each component of the Preferred Alternative during the July 14, 2022 field reconnaissance.

Table 4-1 Documented Vegetation in Project Disturbance Areas

Component (Disturbance Area)	**Species Observed[1] and Notes**
Pipeline routes (approx. 36,000 SF total disturbance area; approximately 12,000 SF within vegetated areas)	Water pipeline alignment: Runs along edge of paved interior roads, currently mowed. Grasses: bentgrass, tall fescue (*Schedonorus arundinaceus*), common velvetgrass; annual rabbit's-foot grass (*Polypogon monspeliensis*). Other herbaceous species: English plantain (*Plantago lanceolata*), bird's-foot trefoil (*Lotus corniculatus*), least hop clover (*Trifolium dubium*), hairy hawkbit (*Leontodon saxatilis* ssp. *saxatilis*). Pipeline to new Filter/UV system: forest area with *western redcedar, *Douglas-fir, *low Oregon-grape (*Mahonia nervosa*), *oceanspray (*Holodiscus discolor* var. *discolor*), *western swordfern (*Polystichum munitum*). Pipeline from Filter/UV system to new Aeration Head Tank: *Oregon ash, reed canarygrass (*Phalaris arundinacea*), *bigleaf maple, *Douglas-fir, *common snowberry (*Symphoricarpos albus*), *Pacific madrone (*Arbutus menziesii*).
Construction access road	Existing dirt road but pruning of encroaching woody plants needed: *bigleaf maple, *Oregon ash, *western redcedar, *osoberry (*Oemleria cerasiformis*). Vegetation along dirt road: Himalayan blackberry, Scotch broom, common nipplewort (*Lapsana communis*), *self-heal (*Prunella vulgaris* var. *lanceolata*), herb-Robert (*Geranium robertianum*), creeping buttercup (*Ranunculus repens*), *bracken fern (*Pteridium aquilinum*), bentgrass, tall fescue, common velvetgrass.
New Filter/UV system (approx. 20,000 SF)	Forested area. Trees: *Douglas-fir, *bigleaf maple; Shrubs: *western redcedar, *grand fir (*Abies grandis*), *low Oregon-grape, English holly (*Ilex aquifolium*), *hairy honeysuckle (*Lonicera hispidula*), *dewberry (*Rubus ursinus*). Herbs: *western swordfern, *western starflower (*Lysimachia latifolia*), *western fescue (*Festuca occidentalis*), *Alaska oniongrass (*Melica subulata*), *Coralroot (*Corallorhiza* sp.).
New distribution valve manifold (approx. 1,000 SF)	The manifold will be placed in an area that is currently mowed grass.
New Building A (approx. 11,250 SF)	Building footprint will cover a weedy area that contains Himalayan blackberry (*Rubus bifrons*), Scotch broom (*Cytisus scoparius*), oxeye daisy (*Leucanthemum vulgare*), Queen Anne's-lace (*Daucus carota*), bentgrass (*Agrostis* sp.), common velvetgrass (*Holcus lanatus*), tansy ragwort (*Jacobaea vulgaris*), orchardgrass (*Dactylis glomerata*), Deptford pink (*Dianthus armeria* ssp. *armeria*). Construction of the building may also require removal of some trees that surround the weedy area, which may include small *western redcedar (*Thuja plicata*) and *Oregon ash (*Fraxinus latifolia*) and larger *Douglas-fir (*Pseudotsuga menziesii*) and *bigleaf maple (*Acer macrophyllum*).
New Building B (approx. 7,500 SF)	Building footprint will cover an existing road and a patch of cherry laurel (*Prunus laurocerasus*).
New Building C (approx. 3,750 SF)	Building footprint will cover an area with a small *western redcedar (possibly planted), *red alder (*Alnus rubra*), Himalayan blackberry, bentgrass, sweet vernalgrass (*Anthoxanthum odoratum*), common velvetgrass, hairy cat's-ear (*Hypochaeris radicata*), tansy ragwort.
New Building D (approx. 1,875 SF)	Building footprint will cover an existing developed area and mowed grass.

[1] native species are denoted with asterisk*. All other species listed are introduced.

Special Status Plant Species

Based on data from the Washington Natural Heritage Program (2022) there are no current or historical records of special status plant occurrences on the MRS property or in the vicinity. No special status plant species or unique plant communities were observed during the July 14 reconnaissance visit.

Noxious Weeds

Noxious weeds are nonnative, invasive plant species that threaten agriculture, rangelands, waterways, parks, wildlife, property values, public health and safety, and general ecological health and diversity of native ecosystems. Noxious weed infestations are the second leading cause of wildlife habitat degradation.

The Kitsap County Noxious Weed Control Program and Board refers to the Washington Noxious Weed Control Board for a list of noxious weed species that require control, eradication, or monitoring (WNWCB 2022). Class A noxious weeds are nonnative species with a limited distribution within the state and the highest priority for eradication to reduce the potential of becoming more widespread.

Class B noxious weeds are regionally abundant but may have limited distribution in some counties. Prevention of new infestations in these areas is the primary goal for control of these species. Class C noxious weeds are either already widely established or are of special interest to the agricultural industry. Placement on the state list allows counties to enforce control if desired.

The weed species observed during the site visit are listed in Table 4-2. No Class A weeds, four Class B weeds, and seven Class C noxious weeds were observed on the MRS property. Table 4-1 (on previous page) indicates specific project areas where these species were encountered, although noxious weeds were not limited in extent to these areas.

Table 4-2 Noxious Weed Observations

Scientific Name	Common Name	Status
Cirsium arvense	Canada thistle	Class C
Cirsium vulgare	bull thistle	Class C
Cytisus scoparius	Scotch broom	Class B
Daucus carota	Queen Anne's lace	Class C
Geranium robertianum	herb-Robert	Class B
Hypochaeris radicata	hairy cat's-ear	Class B
Jacobaea vulgaris	tansy ragwort	Class B
Leucanthemum vulgare	oxeye daisy	Class C
Phalaris arundinacea	reed canarygrass	Class C
Rubus bifrons	Himalayan blackberry	Class C
Rubus laciniatus	evergreen blackberry	Class C

WILDLIFE

General Wildlife

Although no surveys have been completed to document wildlife species in the project area, it is expected that most wildlife occurring in the developed areas of MRS would be birds and small mammals, although some large mammals have also been noted. NOAA staff have reported seeing northern flickers (*Colaptes auratus*) and other birds, river otters (*Lontra canadensis*), fox (*Vulpes vulpes*), coyote (*Canis latrans*), and the occasional black bear (*Ursus americanus*) at the site (J. Hackett and B. Berejikian, pers. comm). The intact forested habitat, which is contiguous with forested habitat in Manchester State Park to the north, likely supports a wider variety of native wildlife species than cleared and developed areas. The forest provides habitat for cavity nesters, and potential nesting trees for raptors such as bald eagle (*Haliaeetus leucocephalus*), osprey (*Pandion haliaetus*), and red-tailed hawk (*Buteo jamaicensis*). The extensive mudflats in Clam Bay provide habitat for waterfowl. Based on eBird sighting lists, 127 species of birds have been observed at the nearby Manchester State Park (eBird 2022). These include a mix of forest dwellers (e.g., dark-eyed junco [*Junco hyemalis*], Swainson's thrush [*Catharus ustulatus*], and woodpeckers); seabirds and shorebirds (e.g., double-crested cormorant [*Nannopterum auritum*], common goldeneye [*Bucephala clangula*], and surf scoter [*Melanitta perspicillata*]); and species that are typically found in more developed areas (e.g., American crow [*Corvus brachyrhynchos*], European starling [*Sturnus vulgaris*], and Steller's jay [*Cyanocitta stelleri*]). These species may also be found on MRS.

Special Status Wildlife

No federal or state-listed terrestrial wildlife species are known to occur in the proposed project development areas. A review of WDFW Priority Habitats and Species (PHS) data (WDFW 2022a) indicates no mapped PHS occurrences of terrestrial wildlife species in or near the MRS or vicinity. The only mapped PHS habitat occurrences are the estuarine and marine wetlands in Clam Bay, salmonid occurrences in Beaver Creek (discussed further in the following subsection on *Fish and Aquatic Organisms*), and a waterfowl wintering site approximately 1,100 feet southeast of the MRS.

Based on information from USFWS Information Planning and Consultation (IPaC), three federally listed terrestrial wildlife species were identified as potentially affected by activities in this location (USFWS 2022), although suitable habitat for these species is not present:

- Marbled murrelet (*Brachyramphus marmoratus*), ESA Threatened, State Endangered – birds forage in the marine waters of Puget Sound and could be found in the vicinity of the MRS. However, old-growth forests required for nesting are not present on the MRS or in the vicinity.
- Streaked horned lark (*Eremophila alpestris strigata*), ESA Threatened, State Endangered – while the MRS is in the species' historic range, the species is not currently known to occur in this area (USFWS 2021b) and large expanses of flat, open ground required for breeding are not present.
- Yellow-billed cuckoo (*Coccyzus americanus*), ESA Threatened, State Endangered – likely extirpated from Washington state, and large tracts of dense riparian woodlands are not present.

The IPaC list also mentions monarch butterfly (*Danaus plexippus*), a candidate for listing under the ESA, but suitable habitat for this species is not present at the MRS.

No ESA critical habitat for terrestrial wildlife species is mapped in the vicinity of MRS (USFWS 2022).

FISH AND OTHER AQUATIC ORGANISMS

No fish occur in the upland portions of the MRS property where the Proposed Action would occur. However, adjacent aquatic habitats of Beaver Creek and Clam Bay support fish and other aquatic species. Beaver Creek supports a variety of resident fish, as well as anadromous fish species.

Based on data from PHS (WDFW 2022a) and SalmonScape (WDFW 2022b), Beaver Creek supports the following salmonid species:

- Coastal cutthroat trout (*Oncorhynchus clarki*)
- Coho salmon (*Oncorhynchus kisutch*) – Candidate for ESA listing; documented spawning habitat
- Fall chum salmon (*Oncorhynchus keta*)

The unnamed tributary to Beaver Creek also has the potential to support these species based on documented habitat conditions, although existing culverts are currently partial fish passage barriers, as described previously (USFWS 2008, 2011).

Bull trout (*Salvelinus confluentus*) appears on the IPaC list for the MRS property but is not known to occur in Beaver Creek or nearby streams in the project vicinity. It does not use East Kitsap drainages for spawning habitat (USFWS 2015).

A variety of fish and aquatic invertebrates occur in Clam Bay and associated marine habitats. The Clam Bay shoreline supports a benthic community that includes various clam and oyster species (Navy 2018). Fish surveys conducted in Clam Bay for the Navy using scuba and beach seine methods in 2015 and 2016 documented 30 species of fish, the most prevalent of which were shiner perch (*Cymatogaster aggregata*) and three-spine stickleback (*Gasterosteus aculeatus*) (Navy 2018). Forage fish (Pacific sand lance [*Ammodytes personatus*] and surf smelt [*Hypomesus pretiosus*]) were collected during the beach seine. Salmonids collected included Chinook (*Oncorhynchus tshawytscha*), chum, coho, and pink (*Oncorhynchus gorbuscha*) salmon, and cutthroat trout.

ESA-listed marine species with the potential to be in the vicinity of Clam Bay include Puget Sound Chinook (Threatened), Puget Sound steelhead (*Oncorhynchus mykiss*, Threatened), and Puget Sound/Georgia Basin Distinct Population Segments (DPSs) of bocaccio (*Sebastes paucispinis*, Endangered) and yelloweye rockfish (*Sebastes ruberrimus*, Threatened) (NMFS 2022a). Fish species with designated critical habitat in the marine waters immediately adjacent to the MRS include bocaccio and Chinook salmon (NMFS 2022b)

MARINE MAMMALS

Marine mammals occur in Puget Sound and have the potential to be found in marine waters adjacent to MRS. Two species are listed under the ESA: the southern resident killer whale (*Orcinus orca*; endangered) and two populations of humpback whale (*Megaptera novaeangliae*; Central America Distinct Population Segment – Endangered; Mexico Distinct Population Segment - Threatened) (NMFS 2022). These species are also listed as endangered by the state of Washington (WDFW 2022c). Other marine mammals in the area are protected under the MMPA. Species with the potential to be found in Puget Sound include minke whale (*Balaenoptera acutorostrata*), gray whale (*Eschrichtius robustus*), harbor porpoise (*Phocoena phocoena*), Dall's porpoise (*Phocoenoides dalli*), Steller sea lion (*Eumetopias jubatus*), California sea lion (*Zalophus californianus*), northern elephant seal (*Mirounga angustirostris*), and harbor seal (*Phoca vitulina*).

Designated critical habitat for the southern resident killer whale includes marine waters immediately adjacent to the MRS (NMFS 2022b).

4.8.3 Environmental Consequences

PREFERRED ALTERNATIVE

Habitats

Construction of the Preferred Alternative would reduce the total acreage of undeveloped land on the MRS and would therefore decrease the amount of habitat available for use by wildlife. There would also be a decrease in the amount of forested habitat on the site, and cavity nesting trees could be removed. Given the prevalence of similar habitats in the area, and the small acreage affected, these impacts would be minor. No construction activities would occur in wetland habitats.

Provided appropriate construction BMPs are implemented to avoid release of sediments and construction debris from work sites, there would be *no impact* to adjacent or nearby marine, estuarine, and riverine habitats.

Plants

The Preferred Alternative would result in the permanent loss or conversion of approximately 5,000 SF of vegetation because of the construction of aboveground project components, and the temporary disturbance of approximately 36,000 SF (0.8 acre) of vegetated land during construction. The new buildings and the majority water pipelines would mostly be constructed in previously disturbed areas that currently support predominantly weedy, introduced species. The new Filter/UV system would be constructed in a forested area and would result in the permanent loss of native forest species, as documented in Table 4-1. Construction of Building A could also require the removal of some native trees. A portion of the pipeline route would also cross through forested areas and require clearing of vegetation during construction. Most of the pipelines would be placed underground, and disturbed areas associated with pipeline installation would be expected to revegetate following construction. However, there would be a long-term conversion from forested habitat to low growing and likely non-native species in these

disturbed areas. The construction access road would require some pruning of trees and shrubs and would affect mostly non-native species that occur along the roadside. Because the areas that would be lost are either low quality disturbed habitats dominated by native species or common native forest communities that are abundant in the region, impacts would be considered *minor*. No ESA-listed or other special status plant species or rare vegetation communities would be affected by project construction.

Given the documented presence of noxious weeds at the MRS, construction activities could lead to the spread of these species through creation of disturbed areas that are susceptible to colonization by invasive species, and through transport of propagules on construction equipment. With implementation of mitigation measures as detailed in Subsection 4.8.4, spread of noxious weeds during construction would be minimized and the impact would be *short term and minor*.

Ongoing maintenance of project disturbance areas, such as mowing of vegetation and trimming of hazard trees, would be required during project operations. These operational effects would be limited to areas already impacted during project construction and would therefore be *negligible*.

Wildlife

During construction, direct impacts to wildlife could occur through injury or mortality and through noise disturbance. While most wildlife are mobile and can move away from construction equipment, more vulnerable species such as burrowing mammals, ground-nesting birds, and very young individuals that do not yet have full mobility could be crushed by vehicles and other equipment. Away from work zones, increased presence of vehicles on access roads (both construction equipment and worker vehicles) could also result in a short-term increase in the risk of wildlife strikes occurring. Given the small area of disturbance and the lack of ESA-listed species in the project area, impacts associated with loss or injury of a small number of individuals would be minor. However, removal of trees that contain nests could result in injury or mortality of chicks or destruction of eggs. For migratory birds, such impacts would be considered take under the MBTA (and for eagles take under the Bald and Golden Eagle Protection Act). With implementation of mitigation measures as detailed in Section 4.8.4, unintentional take of MBTA or eagle species from tree removal activities would be avoided and the impact would be *short term and minor.*

Noise and human presence during construction could disturb wildlife in the area, which could interfere with breeding, hunting/foraging, or other behaviors linked to fitness and survival. Wildlife that occurs at the MRS is likely accustomed to some human presence; however, noise levels associated with construction equipment are expected to be substantially louder than baseline levels (see Section 4.13, *Noise*). Construction noise would occur during daytime hours and therefore would not interfere with nighttime wildlife activities. The increased noise levels would be short-term, occurring during periods of active construction and in various work areas during the 2-year construction period. Wildlife that are sensitive to increased noise levels would likely avoid the construction areas, and some individuals may be able to habituate. Therefore, impacts would generally be minor. However, initiation of construction work during active breeding by migratory birds could adversely affect reproductive success and could constitute take under the MBTA or Bald and Golden Eagle Protection Act. With implementation of

mitigation measures as detailed in Section 4.8.4, unintentional take of MBTA or eagle species from construction-related disturbance would be avoided and the impact would be *short term and minor*.

Indirect impacts to wildlife would occur from loss of habitat in areas where vegetation would be cleared or trees would be removed. Approximately 36,000 SF (0.8 acre) of vegetation would be removed to facilitate construction of the Preferred Alternative, resulting in the permanent loss of the same amount of potential habitat. Loss or conversion of forested habitat would have the potential to impact the greatest variety of native wildlife species, relative to other affected habitat types. However, given the small area affected and the prevalence of similar habitats in the area, these impacts would be *minor*.

During operations, noise levels associated with the research facility would be similar to baseline levels. With additional permanent staff and additional visitors to the site, there could be a small increase in human presence and associated noise, and in vehicle traffic on access roads. However, it is expected that over the long term, wildlife would either habituate to the minor increased activity or relocate. Impacts would be *long-term but negligible to minor*.

Fish, Marine Mammals, and Other Aquatic Organisms

All construction work would occur in upland areas away from habitats used by aquatic species. Provided appropriate construction BMPs are implemented to avoid impacts to adjacent or nearby marine, estuarine, and riverine habitats used by these species, it is expected that there would be *no or negligible effects* to fish, marine mammals, and other aquatic organisms in the project vicinity.

During operations, effluent from the seawater distribution system would have the same water quality and volume characteristics as under existing conditions; however, all discharge would now occur from one central outfall rather than from multiple outfalls along the shoreline, which could result in a higher discharge velocity. Discharge from the central outfall at a higher velocity than at present could alter conditions in the immediate vicinity of the outfall, but it is expected that effects on aquatic species would be *negligible*, because the existing outfall discharges onto rip-rap rather than fine sediments that could increase turbidity.

NO-ACTION ALTERNATIVE

The No-Action Alternative would not alter existing habitat conditions at the MRS and would have no impacts on habitats or species in the project vicinity.

ACTION ALTERNATIVE 1

Under Action Alternative 1 the extent of impacts to vegetation and terrestrial wildlife habitats would be less than under the Preferred Alternative, as no new buildings would be constructed and there would be no changes to the onsite roadways. Installation of the seawater distribution pipelines and construction of the new Filter/UV system, Aeration Head Tank, and Distribution Valve Manifold would result in the permanent loss or conversion of approximately 25,000 SF (0.6 acre) of vegetation within the LOD. Construction of the new Filter/UV system would result in the permanent loss of a small area of native forest habitat and could displace wildlife that use this area. As described for the Preferred Alternative,

because the areas that would be lost are either low quality disturbed habitats dominated by native species or common native forest communities that are abundant in the region, impacts would be considered minor. No ESA-listed or other special status plant species or rare vegetation communities would be affected by construction of Action Alternative 1.

The risk of noxious weed spread under Action Alternative 1 would be as described for the Preferred Alternative, although there would be fewer new disturbance areas and a shorter construction period.

The types of potential direct impacts to wildlife under Action Alternative 1 would be the same as those described for the Preferred Alternative, but with a shorter construction duration and less removal of native trees, the likelihood of injury or mortality would be less. During the construction period, construction noise levels would be similar to those that would occur under the Preferred Alternative, with similar types of impacts to wildlife, although the duration of elevated noise levels would be reduced by half. Mitigation measures to avoid unintentional take would still be needed (see Section 4.8.4). With such mitigation measures in place, direct impacts to wildlife would be short-term and minor, and less than those under the Preferred Alternative.

Similar to the Preferred Alternative, construction work would occur away from habitats used by aquatic species, and with appropriate BMPs in place, impacts to nearby aquatic species are not anticipated. While there could be a slight change in the conditions in the immediate vicinity of the outfall due to an increased velocity of discharge, it is expected that effects on aquatic species would be negligible.

Operation of Action Alternative 1 would have a negligible to minor impact on wildlife. Noise levels associated with the research facility would be similar to baseline levels, but without the small increase in human presence and vehicle traffic described for the Preferred Alternative.

4.8.4 Mitigation Measures

PREFERRED ALTERNATIVE

The following standard BMPs and requirements would be followed during construction to avoid impacts to adjacent or nearby marine, estuarine and riverine habitats used by fish, marine mammals, and other aquatic organisms:

- The construction contractor would prepare and implement a Construction SWPPP, to avoid release of sediment and construction debris into nearby marine, estuarine, and riverine habitats (Clam Bay and Beaver Creek). See Section 4.5, *Water Resources and Hydrological Processes,* for more detail.

The following mitigation measures would be implemented:

- **Mitigation Measure 4.8-1: Noxious Weed Control.**
    - Revegetate disturbed areas, as needed, with a native seed mix to prevent the spread or establishment of invasive species.

  - To prevent the establishment and spread of invasive species, assess populations of noxious weeds and treat weed populations prior to the start of ground-disturbing activities.
  - Use weed-free project staging areas and avoid or minimize travel through areas where noxious weed infestations have been documented.
  - Ensure that construction equipment arriving on site has been cleaned prior to entry. Clean all equipment before leaving the project site.
  - New or replacement landscape plantings shall use native species wherever practicable.

- **Mitigation Measure 4.8-2: Pre-Construction Surveys for Nesting Birds.** A qualified biologist shall survey the project footprint and appropriate survey radii (determined by the biologist based on the species) for migratory birds and their nests prior to construction. If breeding birds are identified, implement appropriate buffers (determined by the biologist based on the species) to prevent unintentional take through nest abandonment or failure. No construction activities shall occur within the buffers until the biologist confirms that activities may recommence.

NO-ACTION ALTERNATIVE

No mitigation measures are required for the No-Action Alternative in relation to flora and fauna.

ACTION ALTERNATIVE 1

The mitigation measures listed for the Preferred Alternative also apply to Action Alternative 1.

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4.9 WETLANDS

This section describes wetlands at the NOAA property and evaluates whether the Proposed Action would affect wetlands or wetland buffers, or conflict with applicable regulations protecting wetlands. The identification and classification of wetlands at the property is based on review of published federal, state, and local information on wetlands, in addition to information gathered during a site visit on July 14, 2022.

4.9.1 Regulatory Setting

FEDERAL

EO 11990: Protection of Wetlands

EO 11990 (Protection of Wetlands) requires federal agencies to provide leadership and take action to minimize the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. Each agency, to the extent permitted by law, must avoid undertaking or providing assistance for new construction located in wetlands unless the head of the agency finds: there is no practical alternative to such construction and the preferred alternative includes all practical measures to minimize harm to wetlands that may result from such use. In making this finding the head of the agency may take into account economic, environmental, and other pertinent factors. Each agency must also provide opportunity for early public review of any plans or proposals for new construction in wetlands. State and local agencies often codify similar requirements for compliance with permitting procedures.

Section 404 of the Clean Water Act

USACE regulates waters of the U.S., including wetlands, under Section 404 of the Clean Water Act. The USACE has determined that "isolated" wetlands or waters are not regulated (or "jurisdictional") waters of the U.S. Dredge or fill within jurisdictional wetlands or other waters of the U.S. requires federal authorization under Section 404 of the Clean Water Act. Federal authorization may be obtained using one or more Nationwide Permits or by obtaining and Individual Permit, depending on the extent of work within jurisdictional wetlands or other waters of the U.S. A Joint Aquatic Resource Permit Application (JARPA), with relevant supporting studies (e.g., wetland delineation report, mitigation plan) is typically used to apply for federal authorization under Section 404 of the Clean Water Act to conduct dredge or fill activities in jurisdictional wetlands or other waters of the U.S.

Section 401 of the Clean Water Act

Section 401 of the Clean Water Act requires that activities permitted under Section 404 meet state water quality standards. Ecology is designated by statute as the state agency responsible for issuing a Section 401 Water Quality Certification when the agency has reasonable assurance that the applicant's project will comply with state water quality standards and other aquatic resource protection requirements under Ecology's authority. The Section 401 Certification can cover both the construction and operation of a proposed project. Applying for a federal permit or license to conduct any activity that might result in a discharge of dredge or fill material into water or non-isolated wetlands or excavation in water or non-isolated wetlands triggers Section 401 review. Conditions of the Section 401 Certification become

conditions of the Federal permit or license. The federal permit is not valid unless it has been certified by Ecology. A Section 401 WQC request form, along with a Joint Aquatic Resource Permit Application (JARPA), is required when a Section 401 WQC is needed from Ecology.

STATE

Washington State Department of Ecology

Ecology regulates wetlands and streams in Washington State under the authority of the State Water Pollution Control Act and the Shoreline Management Act. These two state laws collectively define and limit permitted actions for Waters of the State. A Joint Aquatic Resource Permit Application is typically used to apply for regulatory approval for projects that impact wetlands.

LOCAL

Kitsap County Critical Areas Ordinance

Under Kitsap County Critical Areas Regulations, Chapter 19.100, critical areas review is typically required to conduct work in critical areas and their buffers within unincorporated Kitsap County. Critical areas include: wetlands, fish and wildlife habitat conservation areas, geologically hazardous areas, frequently flooded areas, and critical aquifer recharge areas. As with all local permit processes, NOAA as a federal agency would comply with Kitsap County's critical areas regulations to the maximum extent practicable, in accordance with the federal consistency provision of the Coastal Zone Management Act.

4.9.2 Affected Environment

Wetlands are commonly defined by federal, state, and local regulatory agencies as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions."

No onshore wetlands are mapped at the NOAA property in the National Wetland Inventory (NWI), WDFW PHS data, or Kitsap County's Watercourse and Surface Water map (USFWS 2022; WDFW 2022; Kitsap County 2017). One onshore wetland was identified within the LOD during the July 14 site visit. Based on a limited, informal investigation of the wetland during the site visit by AECOM biologists familiar with regional wetland indicators, this wetland can be classified as an approximately 2,600 square-foot, temporarily or seasonally saturated, depressional, palustrine scrub-shrub/emergent wetland. The estimated wetland boundary is depicted on Figure 4.5-1 in Section *4.5, Water Resources and Hydrological Processes*. The wetland appears to be hydrologically connected to a roadside ditch. A formal wetland delineation would need to be conducted to fully delineate the wetland boundary and determine if it is a jurisdictional wetland under Section 404 of the Clean Water Act.

The wetland would be considered a Water of the State and subject to regulation under the State Water Pollution Control Act. While NOAA as a federal agency is not subject to compliance with the State Water Pollution Control Act on federal land, federal agencies are subject to compliance with the federal consistency provisions of the Coastal Zone Management Act (see Section 4.11, Coastal Zone Management), and the State Water Pollution Control Act is one of the enforceable policies of the State Coastal Zone Management Program.

The wetland would also be considered a critical area under Kitsap County's Critical Areas Ordinance. However, NOAA is not subject to compliance with the County's critical area ordinance, unless the critical area falls under the jurisdiction of Shoreline Management Act, which is also one of the enforceable policies of the State Coastal Zone Management Program (see Section 4.11, Coastal Zone Management). Because this wetland is not associated with a marine water (Clam Bay) and is outside the 200-foot shoreline jurisdiction, it is not subject to the Shoreline Management Act.

The MRS is located on the shoreline of Clam Bay. The NWI classifies Clam Bay as intertidal estuarine/marine wetland with "less than 75 percent aerial cover of stones, boulders, or bedrock" and "less than 30 percent areal cover of vegetation." No vegetated intertidal wetlands were observed in potentially affected areas adjacent to the MRS during the July 14 site visit but may occur along the shoreline in the general project vicinity. However, any vegetated intertidal wetlands present outside the LOD are not considered part of the affected environment.

Beaver Creek flows west-east and discharges into the intertidal mudflats of Clam Bay south of the MRS. The creek includes an impoundment classified as a freshwater pond in the NWI just upstream of its tidally influenced segment. An unnamed tributary to Beaver Creek flows north-south through the western portion of the MRS site and crosses the main access road via a culvert west of the LOD. Upstream of the culvert crossing, this tributary stream flows through low-gradient upland forest habitat within the MRS property (WDFW 2008, 2011). Both Beaver Creek and the unnamed tributary are outside of the LOD and potentially affected areas and are not considered part of the affected environment.

4.9.3 Environmental Consequences

PREFERRED ALTERNATIVE

Potential impacts to wetlands can occur directly (e.g., vegetation removal, placement of fill, or excavation) or indirectly (e.g., stormwater runoff from upland areas). The Preferred Alternative has been designed to avoid direct impacts to the small onshore wetland shown in Figure 4.5-1. No components of the replacement seawater system or new buildings and associated site improvements would be located within or directly adjacent to the small wetland. The Aeration Head Tank would be approximately 30 feet upslope (northwest) of the wetland, and the associated piping between the Aeration Head Tank and Distribution Valve Manifold would be approximately 6 feet to the southwest. Proposed Buildings B and C would be approximately 30 feet from the wetland.

No indirect impacts are anticipated from grading associated with the new buildings due to the presence of the existing road between the Building C footprint and the wetland. The Preferred Alternative could result in indirect impacts to the wetland from erosion and stormwater runoff associated with grading for the Aeration Head Tank upslope of the wetland, and associated pipeline trenching to the southeast of the wetland. With the implementation of standard construction erosion and sediment control BMPs described in Section 4.9.4, the Preferred Alternative would have *no direct or indirect impact* on the wetland during construction. Operation of the Preferred Alternative would have *no impact* on wetlands.

NO-ACTION ALTERNATIVE

The No-Action Alternative would involve no construction activities and no increase in staff numbers or intensity of site use. The No-Action Alternative would have *no impact* on wetlands.

ACTION ALTERNATIVE 1

Action Alternative 1 assumes that NOAA would replace the existing seawater treatment and distribution system, as described for the Preferred Alternative, but would not construct any new buildings or associated site improvements, and operations would continue using the existing systems as long as feasible. Because the design for the replacement seawater system would be the same under Action Alternative 1 as for the Preferred Alternative, the potential indirect impacts of grading for the head tank and associated pipeline trenching would be the same as previously described. With the implementation of standard construction erosion and sediment control BMPs, Action Alternative 1 would have *no direct or indirect impact* on wetlands during construction. Operation of Action Alternative 1 would have *no impact* on wetlands.

4.9.4 Mitigation Measures

PREFERRED ALTERNATIVE

The following standard construction erosion and sediment control BMPs and requirements would be followed during construction to avoid impacts wetlands.

- The construction contractor would prepare and implement a Construction SWPPP and other erosion control measures as detailed in Section 4.5, *Water Resources and Hydrological Processes*.

The following mitigation measures would be implemented:

- **Mitigation Measure 4.9-1: Wetland Delineation and Avoidance.**
  Prior to construction (including any ground-disturbance or vegetation removal) within 100 feet of the small wetland that is present to the west of the main driveway and southwest of Building 22, NOAA shall retain a qualified wetland scientist to conduct a formal wetland delineation in accordance with the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region. Based on the wetland function and rating, the wetland scientist shall recommend an appropriate vegetation protection zone width and other measures to

avoid or minimize sedimentation and turbidity into the wetland. At a minimum such measures shall include:

- Installation of high-visibility fencing around the wetland (including the recommended vegetation protection zone width) to prevent access by personnel or equipment during construction.
- Installation of erosion and sediment controls, including silt fencing, compost socks, and./or straw wattles between the fenced protection zone and nearby construction work areas.
- Stabilization of exposed soils, including stockpiles, in construction areas adjacent to and/or upslope of the wetland.

NO-ACTION ALTERNATIVE

No mitigation measures are required for the No-Action Alternative in relation to wetlands.

ACTION ALTERNATIVE 1

The mitigation measures listed for the Preferred Alternative also apply to Action Alternative 1.

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4.10 FLOODPLAINS

This section describes the mapped 100-year floodplain at the MRS and evaluates whether the Proposed Action would affect the floodplain or floodplain function, or conflict with floodplain management regulations. The floodplain at the MRS and evaluation of impacts is based on review of published information from federal, state, and local governments. Floodplain management is guided by federal, state, and local law. While FEMA has minimum floodplain management standards for communities participating in the National Flood Insurance Program, local jurisdictions may adopt higher standards. Local jurisdictions typically carry out floodplain management functions through management plans and associated policies, ordinances, and regulations, unless the property is owned by a state or federal agency.

4.10.1 Regulatory Setting

FEDERAL

The 100-year floodplain is an area that has a one-percent chance of flooding each year, with a flood elevation that has a one-percent chance of being equaled or exceeded each year. Flooding is also expected to occur, on average, once every 100 years. Although the name implies such a flood occurs every 100 years, in reality, the 100-year flood could occur in any year. EO 11988, "Floodplain Management", dated May 24, 1977, requires that federal agencies locate facilities outside the 100-year floodplain or base floodplain unless there is no practicable alternative location.

If development within the floodplain is unavoidable, structures should be built so that the finished floor elevation is above the 100-year flood elevation as determined by the FEMA and depicted on their Flood Insurance Rate Maps, or the structures should be flood-resistant. Floodplain management is intended to minimize the potential for property damage and to maintain functions of the hydrologic cycle. EO 11988 and NOAA Floodplain Guidance, entitled *Guidance on Compliance with the Implementing Procedures for Executive Orders 11988 and 11990*, is applied to determine effects to these resources (FEMA 2015).

EO 11988 provides an eight-step process for proposed actions that might fall within a designated floodplain. The steps include: 1) Floodplain Determination; 2) Public Notification; 3) Identify and Evaluate Practicable Alternatives to Locating the Proposed Action in a Floodplain and/or Wetland; 4) Identify the Impacts of the Proposed Action; 5) Evaluate Measures to Reduce Potential Adverse Impacts of the Proposed Action; 6) Re-evaluate Alternatives to the Proposed Action; 7) Make the Final Determination and Present the Decision; and finally, 8) Implement the Action (NOAA 2012). The development of project alternatives, project design, identification of floodplains, analysis of impacts to floodplains, and identification of measures to avoid floodplain impacts contained in this EA are part of the eight-step process.

STATE AND LOCAL

There are no State or local regulations pertaining to floodplains that are applicable to the Proposed Action.

4.10.2 Affected Environment

To determine if the Proposed Action falls within a coastal floodplain as defined by FEMA (i.e., the 100- and 500-Year), AECOM reviewed the FEMA flood maps and Flood Insurance Study for Kitsap County, which participates in the National Flood Insurance Program (FEMA 2017a; 2017b). The current FEMA flood map (Effective Flood Insurance Rate Maps Panel Number 53035C0383F) was implemented in 2017 and is shown in Figure 4.10-1, *2017 Effective FEMA Map* (FEMA 2017a). The 1-percent-annual chance (i.e., 100-Year) base flood elevation is 13.3 feet NAVD88 (FEMA 2017b). The map generally shows that coastal flooding is limited near the shoreline at the MRS.

The marine shoreline at the MRS consists of mudflat backed by a low riprap hardened embankment. The effective mapped coastal floodplain does not extend far inland at the site and is generally restricted to an area approximately 2 to 17 feet landward of the coastal embankment edge, except in the northeastern portion of the site where the floodplain extends inland of the main access road, and in the southeast of the site where the floodplain extends inland near the mouth Beaver Creek.

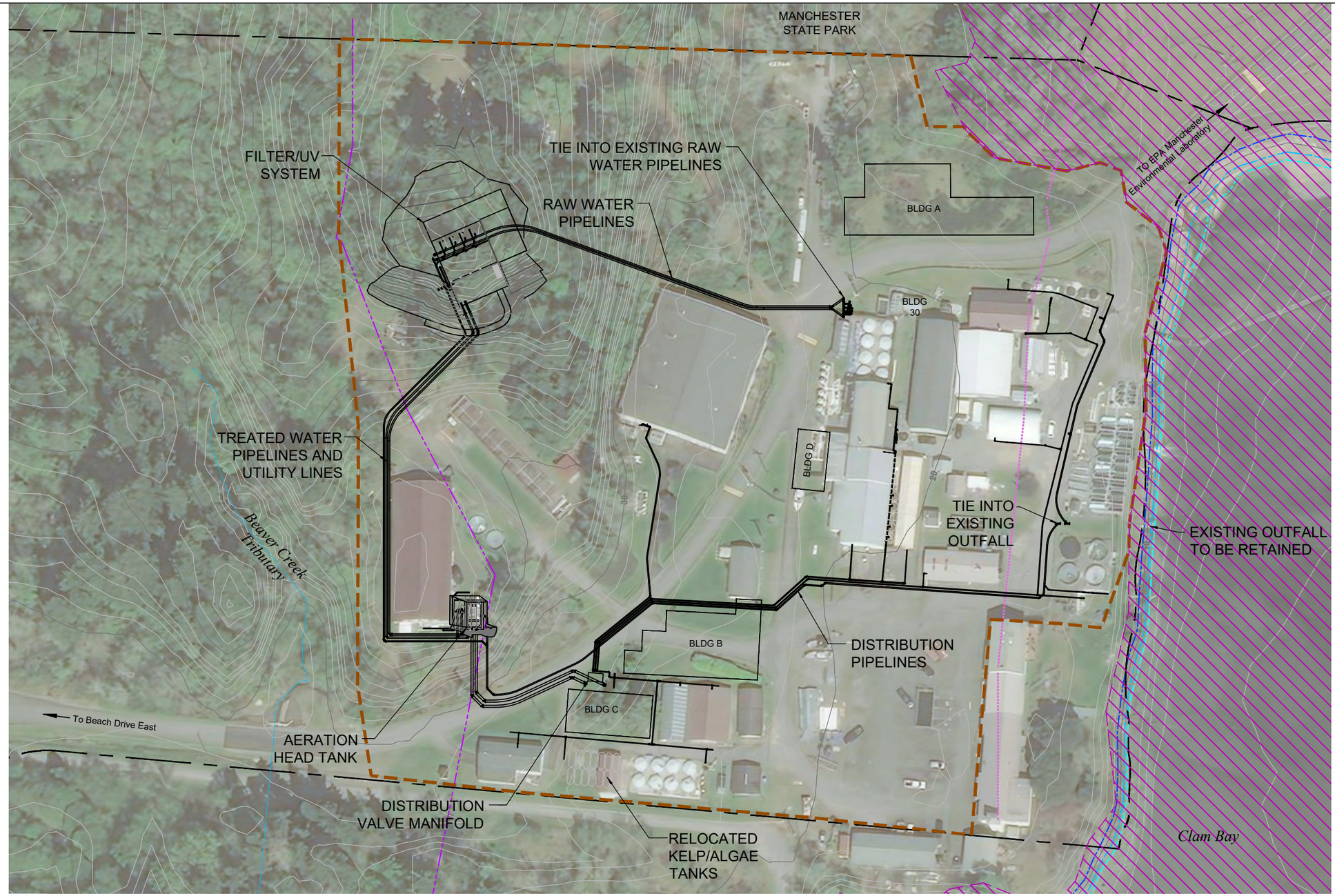
The effective flood map indicates that the eastern edge and northeast corner of the MRS are within the mapped 100-year floodplain. The eastern edge of the site that is within the floodplain is occupied by portions of paved internal access roads, grassed or landscaped areas, kelp/algae tanks and associated equipment, seawater intake and outfall pipelines and riprap shoreline embankment. The northeast corner of the site that is within the floodplain is bisected by the main access road through the site, which ranges from approximately 14.5 feet to 16 feet NAVD88 and is above the base flood elevation of 13.3 feet NAVD88. Flood flows from Clam Bay flow under the access road north of the LOD via an 18-inch box culvert into a vegetated intertidal wetland on the inland side of the road.

4.10.3 Environmental Consequences

PREFERRED ALTERNATIVE

Potential impacts to floodplains can occur directly (e.g., placement of structures or grading activities within the floodplain) or indirectly (e.g., placement of structures or grading activities outside of the floodplain that could redirect flood flows or adversely affect floodplain habitat function). The Preferred Alternative has been designed to avoid direct impacts to the 100-year floodplain. The proposed new seawater treatment and distribution facilities, buildings, internal access roads and parking areas, and associated site improvements will be located inland from the existing shoreline embankment and will all be outside of the effective mapped 100-year floodplain (Figure 4.10-1).

The Preferred Alternative could potentially result in indirect impacts to floodplain habitat function, associated with vegetation clearing and ground disturbance in nearby areas during construction. However, with the implementation of standard construction erosion and sediment control BMPs, detailed in Section 4.5.4, construction of the Preferred Alternative would have *no direct or indirect impact* on the floodplain during construction. Operation of the Preferred Alternative would have *no impact* on the floodplain.



50 0 50 100

SCALE IN FEET

LEGEND

- PROPERTY BOUNDARY
- LIMITS OF DISTURBANCE
- PROPOSED ACTION COMPONENTS
- APPROXIMATE MEAN HIGH WATER (8.2' NAVD 88)
- APPROXIMATE MEAN HIGH-HIGH WATER (9' NAVD 88)
- APPROXIMATE ASTRONOMICAL HIGHEST TIDE (11' NAVD 88)
- 200' SHORELINE MANAGEMENT ACT JURISDICTION
- 165' CREEK SETBACK
- 2' ELEVATION CONTOURS (NAVD88)
- BOUNDARY OF FEMA COASTAL FLOOD ZONE AE

DRAWING SOURCE: HDR.
IMAGERY SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY
CONTOURS FROM USGS NATIONAL ELEVATION DATASET, 2015.

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AECOM

PREFERRED ALTERNATIVE AND EFFECTIVE 100-YEAR FLOODPLAIN CONTOUR

NOVEMBER 2022
60680959

NOAA NWFSC MANCHESTER RESEARCH STATION
SEAWATER SYSTEM REPLACEMENT AND CAMPUS ADDITION PROJECT
MANCHESTER, WASHINGTON

FIGURE 4.10-1

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NO-ACTION ALTERNATIVE

The No-Action Alternative would involve no construction activities and no increase in staff numbers or intensity of site use. Operations would continue using the existing systems as long as feasible. Because there would be no physical changes at the site, the No-Action Alternative would have *no impact* on floodplains.

ACTION ALTERNATIVE 1

Action Alternative 1 assumes that NOAA would replace the existing seawater treatment and distribution system, as described for the Preferred Alternative, but would not construct any new buildings or associated site improvements. Because the design for the replacement seawater system would be the same under Action Alternative 1 as for the Preferred Alternative, there would be no direct impacts to floodplains. The potential for indirect impacts to floodplain habitat from vegetation removal and ground disturbance would be similar but slightly less than for the Preferred Alternative, because of the reduced construction footprint. With the implementation of the same standard construction erosion and sediment control BMPs as described for the Preferred Alternative, Action Alternative 1 would have *no direct or indirect impact* on the floodplain during construction. Operation of Action Alternative 1 would have *no impact* on the floodplain.

4.10.4 Mitigation Measures

PREFERRED ALTERNATIVE

With the implementation of standard construction erosion and sediment control BMPs, no mitigation measures are required for the Preferred Alternative in relation to floodplains. The construction contractor would prepare and implement a Construction SWPPP and other erosion control measures as detailed in Section 4.5, *Water Resources and Hydrological Processes*. Additionally, because the Preferred Alternative does not include activity in or affecting the 100-year floodplain, analysis under EO 11988 is not required.

NO-ACTION ALTERNATIVE

No mitigation measures are required for the No-Action Alternative in relation to floodplains.

ACTION ALTERNATIVE 1

With the implementation of standard construction erosion and sediment control BMPs, no mitigation measures are required for Action Alternative 1 in relation to floodplains. Additionally, because Action Alternative 1 does not include activity in or affecting the 100-year floodplain, analysis under EO 11988 is not required.

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4.11 COASTAL ZONE MANAGEMENT

This section describes coastal uses and resources at the MRS and evaluates whether reasonably foreseeable effects of the Proposed Action on coastal uses and resources are consistent, to the maximum extent practicable, with the enforceable policies of the approved Washington State Coastal Zone Management Program. Coastal uses and resources include land and water uses and natural resources of the coastal zone. While this section provides a high-level review of applicable enforceable policies and project consistency, a standalone Coastal Consistency Determination document demonstrating compliance with the Coastal Zone Management Program in detail is included in Appendix B.

4.11.1 Regulatory Setting

FEDERAL

Coastal Zone Management Act

The Coastal Zone Management Act was passed by Congress in 1972, as amended, and it authorizes certain coastal states to actively manage and protect coastal and shoreline resources from residential, recreational, commercial, and industrial uses. States have the primary role of managing coastal areas via an approved Coastal Zone Management Program, which describes how the state will manage coastal uses and resources in the coastal zone.

The federal consistency provision of the Coastal Zone Management Act provides that federal actions that have reasonably foreseeable effects on any land or water use or natural resource of the coastal zone (also referred to as coastal uses or resources should be consistent, to the maximum extent practicable, with the enforceable policies of a coastal state's federally approved Coastal Zone Management Program (discussed below). Known as the "effects test," a federal agency must determine whether there are such effects, and, if there are, the agency must submit a Federal Consistency Determination to the state. Federal consistency requirements are described in Section 307 of the Coastal Zone Management Act and at 15 CFR Section 930.

STATE

Coastal Zone Management Program

Ecology administers Washington's Coastal Zone Management Program. The program applies to all lands and waters in Washington's coastal counties, including Kitsap County where the Proposed Action is located, and extends from the shoreline seaward three nautical miles. While Federal and tribal lands are excluded from a state's coastal zone, the Proposed Action is subject to the federal consistency provision of the Coastal Zone Management Act as discussed below.

Coastal Zone Management Federal Consistency Review

The federal Coastal Zone Management Act authorizes states with approved Coastal Zone Management Programs to review the following federal actions: (1) federal activities; (2) projects which require a

federal permit/license; or (3) projects utilizing federal funding proposed in a state's coastal zone. The state review process for these federal actions is known as federal consistency and serves as a tool to manage coastal activities and resources and to facilitate coordination and cooperation with federal agencies. Generally, federal consistency requires that federal actions within and outside the coastal zone, which have reasonably foreseeable effects on any coastal use (land or water) or natural resource of the coastal zone be consistent with the enforceable policies of a state's federally approved Coastal Zone Management Program. The specific type of federal action will determine whether a consistency determination or certification is required.

Under Washington's Coastal Zone Management Program, federal activities that could affect the coastal zone must comply with the enforceable policies within the following four state laws, the state Marine Spatial Plan (MSP), and their implementing regulations (Ecology 2020):

- Washington Shoreline Management Act (including local government shoreline master programs)
- Washington Water Pollution Control Act
- Washington Clean Air Act
- Washington Ocean Resources Management Act

Local government shoreline master programs (SMP) contain all of the enforceable policies found in the State Shoreline Management Act. Consequently, Ecology allows federal agencies to use either the State Shoreline Management Act or the local SMP to demonstrate consistency. The Kitsap County SMP is used in this analysis to demonstrate consistency with the Coastal Zone Management Program.

The enforceable policies within these four state laws and their implementing regulations, as applicable to the Proposed Action, are discussed below in Section 4.11.3, *Environmental Consequences*.

The Marine Spatial Plan and the Ocean Resources Management Act apply within state waters off Washington's coast from Cape Flattery to the mouth of the Columbia River, including Grays Harbor and Willapa Bay. As the Proposed Action is in Puget Sound, the Marine Spatial Plan and Ocean Resources Management Act are not applicable, and are not discussed further in this report.

LOCAL

Kitsap County Shoreline Master Program

Washington's Shoreline Management Act is implemented within unincorporated Kitsap County through Kitsap County's current SMP contained in Title 22 (Shoreline Master Program) of the KCC. Elements of the Kitsap County SMP applicable to the Proposed Action are discussed below in Section 4.11.3, *Environmental Consequences.*

4.11.2 Affected Environment

The MRS is in Kitsap County, which lies within Washington's coastal zone. The Proposed Action involves the modification of existing nearshore facilities and development of new nearshore facilities in

the Coastal Zone, is a federal activity, and has reasonably foreseeable coastal effects. Therefore, it would be subject to review under the federal consistency provisions of the Coastal Zone Management Program. Coastal resources in the vicinity of the MRS include the shoreline, intertidal, and deep water habitats of Clam Bay, coastal 100-year floodplain, Beaver Creek, and fish and aquatic species.

Existing structures at the MRS include upland, shoreline, and intertidal zone facilities. Upland facilities include buildings, roads and parking lots; raw and treated seawater distribution pipelines, pumps, and treatment facilities; fish-rearing tanks; and kelp/algae tanks and associated equipment; and grass or landscaped areas. Shoreline facilities include seawater intake and discharge pipelines and outfalls. Seawater supply pipelines extends from upland facilities, across the intertidal mudflats, into the subtidal zone, and three outfalls for the existing seawater circulation system discharge onto the mudflats.

Clam Bay, west of the MRS, consists of extensive intertidal mudflats. The NWI classifies Clam Bay as intertidal estuarine/marine wetland. No vegetated intertidal wetlands were observed in Clam Bay adjacent to the MRS during the July 14, 2022, site visit, but may occur north or south of the site. Clam Bay is considered a Water of the State subject to regulation under the State Water Pollution Control Act. Clam Bay is also considered a Shoreline of the State and a Shoreline of Statewide Significance. Areas within 200-feet of the ordinary high water line or high tide line are subject to regulation under the County's SMP. The Proposed Action does not include development below the high tide line of Clam Bay.

The shoreline jurisdiction extends 200-feet landward of the ordinary high water line. Where the ordinary high water line cannot be found, the ordinary high water line adjoining salt water is the mean higher high tide line (KCC 22.150.465). The shoreline jurisdiction includes associated wetlands, floodways, and up to 200 feet of floodplain. A portion of the affected environment for the Proposed Action is within the shoreline jurisdiction. The affected environment within the shoreline jurisdiction does not contain wetlands or mapped floodway, but is within the mapped coastal floodplain.

A small scrub-shrub/emergent wetland was identified in the upland portion of the site during the July 14, 2022 site visit (see Section 4.9, *Wetlands*). The wetland is considered a Water of the State subject to regulation under the State Water Pollution Control Act. The wetland is also considered a critical area under Kitsap County's Critical Areas Ordinance. However, NOAA is not subject to compliance with the County's critical area ordinance, unless the critical area falls under the jurisdiction of Shoreline Management Act. Because the wetland is not within the shoreline jurisdiction, it is not subject to the Shoreline Management Act and not considered part of the affected environment for coastal resources.

The effective flood map indicates that the eastern edge and northeast corner of the MRS are within the mapped 100-year floodplain. The Proposed Action has been designed to avoid development within the mapped 100-year floodplain (see Section 4.10, *Floodplains*).

Beaver Creek flows west to east and discharges into the intertidal mudflats of Clam Bay south of the MRS. An unnamed tributary to Beaver Creek flows north to south through the western portion of the MRS property and crosses the main access road via a culvert west of the LOD. Both streams are outside of the LOD for the Proposed Action and potentially affected areas and are not considered part of the affected environment.

In summary, the affected environment for coastal resources includes areas within the shoreline jurisdiction and mapped coastal floodplain. However, the affected area for the Proposed Action does not include areas below the high tide line of Clam Bay, wetlands, or streams.

4.11.3 Environmental Consequences

PREFERRED ALTERNATIVE

Shoreline Management Act

The MRS is in unincorporated Kitsap County, and the County has adopted the Kitsap County SMP, consistent with the State Shoreline Management Act and approved by Ecology. As discussed in Section 4.1, *Land Use*, under KCC 22.100.120(B)(6), projects on shorelines under exclusive federal jurisdiction are not required to obtain shoreline permits or reviews. However, as specified in KCC 22.100.120(C) federal agency activities affecting the uses or resources subject to the Shoreline Management Act must be consistent to the extent practicable with the enforceable provisions of the Act and the County's SMP. As specified in KCC 22.100.120(G), Coastal Zone Management Act consistency review for sites within federal jurisdiction shall apply the shoreline environmental designation criteria in Chapter 22.200 that most closely correspond to the project site in order to determine applicable program policies.

The shoreline environmental designation that appears to correspond to the site most closely is Rural Conservancy. This shoreline environmental designation includes shorelines outside of the urban growth area or limited areas of more intensive rural development that support lesser-intensity resource base uses, including aquaculture (KCC 22.200.125). Management policies for the Rural Conservancy designation are listed and addressed below.

KCC 22.200.125(C). Management Policies:

1. Uses should be limited to those which sustain the shoreline area's physical and biological resources, and those of a nonpermanent nature that do not substantially degrade ecological functions or the rural or natural character of the shoreline area. Developments or uses that would substantially degrade or permanently deplete the physical and biological resources of the area should not be allowed.

The Preferred Alternative will not alter existing uses of the shoreline at the MRS. New impacts the shoreline area's physical and biological resources would be limited to trenching and associated backfill to original grade (i.e., no net fill) within the coastal floodplain required for installation of trunk lines, overflow pipelines, and drain connections to existing tanks and buildings. Most of the proposed pipeline installation within the shoreline jurisdiction would be within the existing, paved roadway or graveled areas, although a small amount of trenching in grassed areas would be required. The temporary disturbance of these areas, and permanent presence of underground water pipelines, would not substantially degrade or deplete the physical and biological resources of the area.

2. New development should be designed and located to preclude the need for shoreline stabilization. New shoreline stabilization or flood control measures should only be allowed where there is a documented need to protect an existing structure or ecological functions and mitigation is applied.

The Preferred Alternative would not require new shoreline stabilization or flood control measures.

3. Residential development standards shall ensure no net loss of shoreline ecological functions and should preserve the existing character of the shoreline consistent with the purpose of the "rural conservancy" environment.

The Preferred Alternative would not involve residential development.

4. Low-intensity, water-oriented commercial uses may be permitted in the limited instances where those uses have been located in the past or at unique sites in rural communities that possess shoreline conditions and services to support the development.

The Preferred Alternative would not include commercial uses.

5. Water-dependent and water-enjoyment recreation facilities that do not deplete the resource over time, such as boating facilities, angling, hunting, wildlife viewing trails and swimming beaches, are preferred uses, provided significant adverse impacts to the shoreline area are mitigated.

The Preferred Alternative would not include recreation facilities.

6. Agriculture, commercial forestry and aquaculture, when consistent with the program, may be allowed.

The Preferred Alternative would support the continuation of existing aquaculture research at the site.

Consistency with the other provisions, goals, and/or policies of the Kitsap County SMP are addressed in detail in Appendix B of this EA. This includes policies related to shorelines of statewide significance, floodplains, critical areas, public access, and many other topics.

State Water Pollution Control Act

The Preferred Alternative would include the installation of new seawater treatment facilities and distribution system to replace the existing system. The existing seawater intake system in Clam Bay would not be altered. The Preferred Alternative includes abandoning (in place) five seawater discharge outfalls and directing all seawater discharge from the site into one existing outfall. This would not alter overall effluent volume or quality discharged from the site, but velocity at the remaining outfall would increase slightly compared to the existing velocity at this outfall. The Preferred Alternative also includes the construction of new buildings, driveways, and parking areas. During operations, stormwater from roofs, roads, and parking areas would continue to be collected and discharged to Clam Bay in a similar manner to existing conditions. Precipitation falling on pervious surfaces, including landscaped areas, would infiltrate into the ground. See Section 4.5 for additional discussion.

Ecology is responsible for participating fully in and meeting the requirements of the Federal CWA through the Washington State Water Pollution Control Act (RCW 90.48) and its implementing regulations. Ecology issues Section 401 Water Quality Certifications, which indicate that a project meets the State's water quality standards, and Section 402 National Pollutant Discharge Elimination System (NPDES) permits. Receipt of a Section 401 Water Certification decision, NPDES Permit, or other state water quality permit, may demonstrate consistency with the enforceable policies of the WPCA. However, if a state water quality permit or certification is not required, federal consistency applicants must still demonstrate consistency with the WPCA. At this time, MRS is not regulated under EPA's NPDES General Permit for Federal Aquaculture Facilities (Permit No. WAG130000) since it falls below the permitting thresholds for CAAP facilities (EPA 2009). As with the current seawater treatment and distribution system, it is expected that EPA would not consider discharges from the seawater outfall to be a point source subject to regulation under EPA's NPDES General Permit for Federal Aquaculture Facilities.

Because no Section 404 or Section 10 permits would be required, no water quality certification under Section 401 of the Clean Water Act would be required either. However, as the proposed action would disturb over an acre of land, NOAA's construction contractor will obtain an EPA Region 10 Construction General Permit, including preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP) that outlines required erosion and sediment controls used to meet permit conditions. While receipt of a NPDES Construction General Permit would be required for construction of the proposed action, no NPDES Permit is required for operation of the upgraded facilities. Consequently, NOAA must still demonstrate that operation of the upgraded facility is consistent with the WPCA.

The Coastal Consistency Determination document included in Appendix B provides an evaluation of the project's consistency with the WPCA. Based on the analysis provided in that document, the project is consistent with all applicable policies in the WPCA.

State Clean Air Act

The Washington State Clean Air Act (RCW 70.94) establishes the public policy to preserve, protect, and enhance the air quality for current and future generations, establishes rules to preserve acceptable air quality and levies penalties for violations. Enforceable policies of the State Clean Air Act also include those contained in WAC 173.400 through WAC 173.495. Policies contained in WAC 173.400 through WAC 173.495 are not applicable to automobiles, trucks, or aircraft, or to nonroad engines that are self-propelled and/or perform another function or is intended to be propelled while performing its function, to nonroad engines with a cumulative maximum rated brake horsepower of 500 or less, or engines stored for dispatch to the field for use that do not provide back-up power, or to backup non-road engines having the same or lower emissions than the primary power non-road engine (WAC 173-400-035).

The Preferred Alternative would not result in any permanent new sources of air pollutant emissions, so a permit for a new source (Notice of Construction) would not be required. A detailed review of the project's consistency with the Washington State Clean Air Act is included in Appendix B.

Conclusion

Based on the analysis of impacts contained in this EA, and the detailed Coastal Consistency Determination contained in Appendix B, the Preferred Alternative would be consistent to the maximum extent practicable with the enforceable policies of the Washington Coastal Zone Management Program. A Federal Consistency Determination in accordance with the Washington Coastal Zone Management Program is included in Appendix B, and states that the project is consistent based on the findings in this EA. The impact to coastal resources from the Preferred Alternative would be *negligible*.

NO-ACTION ALTERNATIVE

The No-Action Alternative would involve no construction activities and no increase in staff numbers or intensity of site use. The No-Action Alternative assumes that no federal action would occur within the coastal zone. No new effects on coastal resources would result and a Federal Consistency Determination would not be required. There would be *no impact*.

ACTION ALTERNATIVE 1

Action Alternative 1 would have slightly lower impacts to coastal resources as it would not include the construction of new buildings. The impact to coastal resources from Action Alternative 1 would be *negligible*.

4.11.4 Mitigation Measures

No mitigation measures are required relevant to coastal zone management and coastal resources for the Preferred Alternative, No-Action Alternative, or Action Alternative 1.

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4.12 FARMLANDS

This section describes farmland and agricultural use at the MRS and surrounding areas and evaluates whether the Proposed Action would conflict with previously established and cultivated farmland. The description of existing setting and evaluation of the impacts is based on review of published information from previous site records and Kitsap County. Farmland and agricultural designations and land management decisions are guided by local comprehensive plans which specify the allowable types and locations of present and future land use. Designations for land use are typically made by the local jurisdiction through such management plans and associated policies, ordinances, and regulations, unless the property is owned by a state or federal agency.

4.12.1 Regulatory Setting

FEDERAL

Farmland Protection Policy Act, 1981

The Farmland Protection Policy Act became law in 1981 and is intended to minimize the impact of federal program actions from converting farmland to nonagricultural uses that would undermine economies in rural areas. Farmland includes prime farmland, unique farmland, and farmland of statewide or local importance. The Farmland Protection Policy Act mandates federal agencies to examine if potentially adverse effects to prime or unique farmlands or farmlands of state or local importance would occur before approving any action that would irreversibly convert farmland to non-agricultural uses. The U.S. Department of Agriculture Natural Resources Conservation Service (NRCS) defines prime farmland as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses, including cultivated land, pastureland, forest land, or other land (NRCS 2002).

For projects that have the potential to convert important farmland to non-farm use, U.S. Department of Agriculture Service Center uses a land evaluation and site assessment system to establish a farmland conversion impact rating score on proposed sites. This score is used as an indicator for the project sponsor to consider alternative sites if the potential adverse impacts on the farmland exceed the recommended allowable level. In instances where the conversion of prime farmland is necessary, the U.S. Department of Agriculture has created the Farmland Conversion Impact Rating system (NRCS 2002).

STATE AND LOCAL

There are no State or local regulations pertaining to farmland that are applicable to the Proposed Action.

4.12.2 Affected Environment

The entire MRS property is within federally owned land on the shores of Clam Bay in Puget Sound, approximately 1 mile north of Manchester in Kitsap County, Washington, and is zoned for “Military” use (Kitsap County 2018). NRCS has categorized the soils throughout the entire 11-acre LOD as either prime

farmland (approximately 10 acres) or farmland of statewide importance (approximately 1 acre), as defined under the Farmland Protection Policy Act (FPPA) (NRCS 2022). However, approximately 6 acres (55 percent) of the LOD is land that has been previously developed, consisting of buildings, roadways, and parking areas (see Figure 2.1-5). Furthermore, NWFSC has operated the MRS since the 1970s and no agricultural activities have taken place on the site since that time. Prior to NWFSC operations, the site was formerly used by the Navy. The area immediately surrounding the NOAA property is occupied by the Department of Defense fuel tank farm to the south, the EPA's Manchester Environmental Laboratory to the north, Manchester State Park to the northwest, and residential parcels to the west.

4.12.3 Environmental Consequences

PREFERRED ALTERNATIVE

Construction

Construction of the Preferred Alternative would occur on 11 acres of FPPA-designated farmland soils. However, approximately 6.2 acres of the LOD categorized by NRCS as prime farmland has been previously developed (see Figure 2.1-5). Only approximately 5 acres of the LOD contains undeveloped FPPA-designated farmland soils. Proposed construction-related disturbance within previously undeveloped areas of the LOD would primarily be to facilitate construction of the UV Filter System and Building A. The total area of temporary disturbance in previously undeveloped areas of the site would be approximately 1 acre. Furthermore, the Preferred Alternative would be carried out within an established federal facility on land designated for military use by Kitsap County that is therefore not available for agricultural uses. No farmlands or working forestlands immediately surround the MRS. Therefore, construction of the Preferred Alternative would have *no impact* on farmland resources.

Operati*on*

Operation of the Preferred Alternative would have *no impact* on farmland resources because the MRS is an existing federal facility and the land is not available for agricultural use. Additionally, operational activities would not include any ground disturbance or land conversion.

NO-ACTION ALTERNATIVE

The No-Action Alternative would involve no construction activities and no increase in staff numbers or intensity of site use. Because there would be no physical changes at the site, there would be *no impact* to farmland resources.

ACTION ALTERNATIVE 1

Construction-related ground disturbance of FPPA-designated farmland soils would be reduced under Action Alternative 1, as no Phase 2 construction activities (i.e., new building construction and associated site improvements) would occur. Construction of the seawater treatment and distribution system would still occur and would impact FPAA-designated soils. However, as with the Preferred Alternative, the

MRS is an existing federal facility and the land is not available for agricultural use. Therefore, implementation of Action Alternative 1 would have *no impact* on farmland resources.

4.12.4 Mitigation Measures

No mitigation measures are required for the Preferred Alternative, No-Action Alternative, or Alternative 1 in relation to farmlands.

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4.13 NOISE

This section analyzes the potential terrestrial (airborne) noise impacts associated with the Proposed Action. Hydroacoustic (marine) noise would have no potential to be affected, as no in-water work would occur as part of the Proposed Action. Therefore, an analysis of hydroacoustic noise considerations is excluded from this section. A brief discussion of applicable acoustic and vibration concepts and principles is provided in Section 4.13.2, to aid reader understanding.

4.13.1 Regulatory Setting

FEDERAL

Noise Control Act and Quiet Communities Act

The federal Noise Control Act of 1972 required that all federal agencies administer their programs to promote an environment free of noise that would jeopardize public health or welfare. The Noise Control Act directed the EPA to identify acceptable limits under various conditions that would protect public health and welfare with an adequate margin of safety. The EPA published a summary of these acceptable limits in 1978, as follows:

- L_{eq} of less than or equal to 55 dBA for outdoor areas where people spend limited amounts of time, such as school yards or playgrounds.
- L_{dn} of less than or equal to 55 dBA for outdoor areas at residences and other areas where people spend varying amounts of time and where quiet is a basis for the use of such areas. L_{dn} is a community noise metric that is calculated using the average dBA noise level over a 24-hour period, but which includes a 10 dBA penalty for nighttime hours (10:00 p.m. to 7:00 a.m.) to account for additional annoyance experienced from nighttime noise.

However, the EPA stresses that the protective levels should "not be viewed as standards, criteria, regulations, or goals. Rather, they should be viewed as levels below which there is no reason to suspect that the general population will be at risk from any identified effects of noise" (EPA 1979). Therefore, the EPA levels are guidance levels rather than enforceable standards or regulations.

Section 4(b) of the federal Noise Control Act directs federal agencies to comply with applicable federal, state, and local noise requirements with respect to the control and abatement of environmental noise.

STATE

Washington State Maximum Environmental Noise Levels (WAC 173-60)

At the state level, Chapter 173-60 of the WAC establishes the maximum permissible noise levels for which noise from one property may intrude into another property. Land uses are assigned an environmental designation for noise abatement (EDNA) based on the typical land use, taking into consideration the present, future, and historical usage, and the usage of adjacent and other lands in the vicinity (Table 4-3).

Table 4-3 Washington State Environmental Designation for Noise Abatements

EDNA	Land Use Zone
Class A	Lands where human beings reside and sleep: residential, multi-family living accommodations; recreational and entertainment (e.g., camps, parks, camping facilities, and resorts); and community service (e.g., orphanages, homes for the aged, hospitals, health and correctional facilities).
Class B	Lands involving uses requiring protection against noise interference with speech: commercial living establishments; commercial dining establishments; motor vehicle services; retail services; banks and office buildings; miscellaneous commercial services on property not used for human habitation; recreation and entertainment on property not used for human habitation (e.g., theaters, stadiums, fairgrounds, and amusement parks); community services on property not used for human habitation (e.g., educational, religious, governmental, cultural, and recreational facilities).
Class C	Lands involving economic activities of such a nature that higher noise levels than experienced in other areas are normally anticipated. People working in these areas are normally covered by noise control regulations of the department of labor and industries. Uses typical of Class A EDNA are typically not permitted within such areas. Class C EDNAs include storage, warehouse, and distribution facilities; industrial property used for the production and fabrication or durable and non-durable man-made goods; and agricultural and silviculture property used for the production of crops, wood products, or livestock.

Source: WAC 173-60-030.
EDNA = environmental designation for noise abatement

This regulation applies to noise generated at the MRS that may propagate to adjacent properties. Table 4-4 summarizes the maximum permissible noise levels for which noise from one property (noise source) may intrude into another (receiving property).

Table 4-4 Washington State Maximum Permissible Noise Levels at Receiving Property Line

Environmental Designation for Noise Abatement	Class A Receiving Property (Daytime)	Class A Receiving Property (Nighttime)[1]	Class B Receiving Property (All Hours)	Class C Receiving Property (All Hours)
Class A Noise Source	55	45	57	60
Class B Noise Source	57	47	60	65
Class C Noise Source	60	50	65	70

[1] Between the hours of 10:00 p.m. and 7:00 a.m., the maximum permissible noise levels are reduced by 10 dBA for receiving properties within Class A EDNAs
dBA = A weighted decibel; EDNA = environmental designation for noise abatement
Source: WAC 173-60-040

The state noise regulations allow these noise levels to be exceeded by up to 15 dBA for certain brief periods without violating the limits (WAC 173-60-040(2)(c)). Sounds originating from temporary construction activities are exempt from these noise levels between the hours of 7:00 a.m. and 10:00 p.m. at Class A EDNAs and at all times at Class B EDNAs and Class C EDNAs (WAC 173-60-050(3)(a)). Sounds created by warning devices not operating continuously for more than 5 minutes, and sounds created by safety and protective devices where noise suppression would defeat the intent are exempt from provisions of WAC 173-60-040.

LOCAL

Kitsap County Noise Ordinance (Kitsap County Code 10.28)

The Kitsap County Noise Ordinance (Kitsap County Code 10.28) adopts by reference WAC 173-60 for the regulation of environmental noise. Noise associated with construction activities occurring between the hours of 7:00 a.m. to 10:00 p.m. is exempt from the County noise ordinance (Kitsap County Code 10.28.070(1)).

4.13.2 Affected Environment

APPLICABLE ACOUSTIC CONCEPTS AND PRINCIPLES

Sound and Noise Fundamentals

Sound is a vibratory disturbance created by a moving or vibrating source, which is capable of being detected by the hearing organs. Noise is typically characterized as any sound that is undesirable to the receptor because it interferes with communication, is intense enough to damage hearing, or is otherwise intrusive. Noise may be intermittent or continuous, steady or impulsive.

Decibels and A-Weighting

In its most basic form, a continuous sound can be described by its frequency or wavelength (pitch) and its amplitude (loudness). Frequency is expressed in cycles per second, or Hertz. Frequencies are heard as the pitch or tone of sound. High-pitched sounds are characterized by higher frequencies in the audible spectrum; and, low-pitched sounds are established by lower frequencies. Sound pressure amplitude is measured in units of micro Pascals. Sound pressure amplitudes for different kinds of common terrestrial noise environments can range from 20 to 100,000,000 micro Pascals. Because this huge range of values is cumbersome and difficult to use or discuss, application of a logarithmic scale enables description of sound pressure level in terms of decibels (dB). A decibel is a relative measure, not an absolute measure, that is based upon a referenced value (sound pressure level = $20 \log[p_1/p_r]$, where p_1 is the measured sound pressure and p_r is the reference pressure standardized at 20 micro Pascals, which is the quietest sound that can be heard by most humans - the “threshold of hearing"). Note that this human hearing threshold is not a complete lack of acoustical energy, it is merely the minimum sound or “floor” that can be sensed by average healthy human hearing.

Furthermore, the human ear is not equally sensitive to all frequencies within the audible sound spectrum. To accommodate this phenomenon, the A-weighting scale, which approximates the frequency response of the average young healthy ear when listening to most ordinary everyday sounds, was devised. When people make relative judgments of the loudness or annoyance of a sound, their judgments correlate well with the A-weighting scale for levels of those sounds. Therefore, the “A-weighted” noise scale is commonly used for measurements, standards and assessment involving the human perception of noise. The A-weighted scale begins at zero, which represents the faintest sound that humans with normal hearing can hear. Noise levels described with A-weighted measurements or predictions are written as dBA, while the unweighted levels are distinguished by dB (and hence the lack of the added “A” suffix).

Decibel Addition

Decibels are measured on a logarithmic scale that quantifies sound intensity, similar to the Richter scale used for earthquake magnitudes. Therefore, decibels cannot be added or subtracted through ordinary arithmetic. A doubling of the energy of a noise source, such as doubling of traffic volume, would increase the noise level by 3 dB; a halving of the energy would result in a 3 dB decrease. For example, if an air conditioner produces a sound pressure level of 85 dB at 50 feet, two of the same air conditioners at the same distance from a detection point would produce 88 dB, not 170 dB (Caltrans 2009).

Perception of Noise at the Receiver

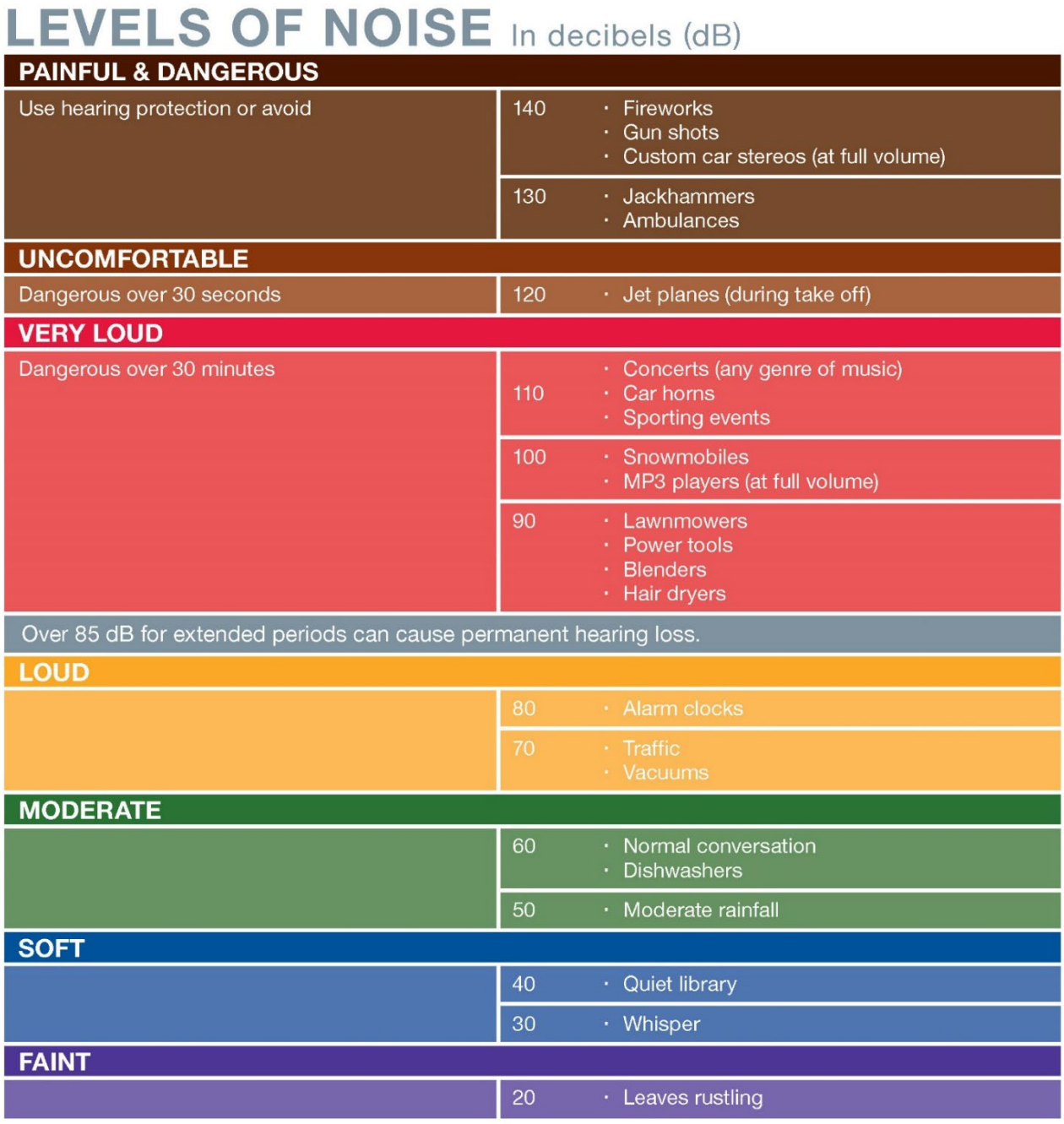
The human perception of noise is not linear in terms of dBA or in terms of acoustical energy. Two identical noise sources do not "sound twice as loud" as one source. It is widely accepted that the average healthy ear can barely perceive changes of less than about 3 dBA, either as an increase or decrease in magnitude; that a change (up or down) of 5 dBA is readily perceptible; and that an increase (or decrease) of 10 dBA sounds twice (half) as loud (Caltrans 2009). For example, if the ambient noise level in an area is 39 dBA, most people would readily notice its increase to a level of 44 dBA at the same listening location, and an increase to 49 dBA would sound twice as loud to most people.

A person's perception of sound can be affected by several factors, such as the spatial distribution of the sound source, the duration of the sound, the time pattern of the sound, and the time of day of the sound (Caltrans 2009). Several different descriptors of time-averaged noise levels are commonly used to describe environmental noise. The selection of a proper noise descriptor for a specific source depends on the spatial and temporal distribution, duration, and fluctuation of both the noise source and the environment. The noise descriptors used in this report to describe environmental noise (with A-weighting implied, unless otherwise noted) are defined as follows:

- L_{max} *(Maximum Noise Level):* The highest root-mean-square noise level occurring during a specific period of time.
- L_{min} *(Minimum Noise Level):* The lowest root-mean-square noise level during a specific period of time.
- Peak: The highest weighted or unweighted instantaneous peak-to-peak value occurring during a measurement period.
- L_{eq} *(Equivalent Noise Level):* The energy-mean (average) noise level. The steady-state sound level that, in a specified period of time, contains the same acoustical energy as a varying sound level over the same time period. For instance, the energy-equivalent sound level over a one-hour period would be described with a L_{eq1h} value, which may be different from a 24-hour duration L_{eq24h} value.
- L_{dn} *(Day-Night Noise Level):* Calculated in a manner similar to an L_{eq} composed of 24 consecutive hourly sound levels, this descriptor includes an added 10 dBA "penalty" applied during nighttime noise-sensitive hours from 10:00 p.m. through 7:00 a.m. The resulting L_{dn} value, intended to account for the fact that noise during this specific 9-hour period of time is a potential

source of disturbance with respect to normal sleeping hours, will thus be higher than a continuous 24-hour L_{eq} value by 6.4 dB.

Typical sound levels of familiar settings are shown in Figure 4.13-1 and include the approximate decibel levels of commonly known sound sources in typical referenced environments.



Source: Karnataka State Law University 2020.

Figure 4.13-1 Typical Sound Levels

Noise Generation, Transmission, and Reduction

Noise Sources

Sound is a pressure wave that decreases geometrically in intensity over distance from the source. Noise attenuation is generally described as a reduction in decibel level per doubling of distance from the source. Depending on the nature of the noise source, noise propagates at different rates. The two most common types of noise are point sources and line sources.

Point source noise is usually associated with one or more sound sources that generally remain in one place for extended periods of time, such as with most construction activities, and are described within an area having a largest dimension that is much smaller than the distance from this acoustical point source to a receptor of interest. A few examples of point sources of noise are pile drivers, jackhammers, rock drills, or excavators working in one location. A construction site is typically considered a point source. Construction point source noise is commonly measured by maximum decibel level (L_{max}), or the highest value of a sound pressure over a stated time interval. Noise from a point source diverges spherically over distance, with a rate of reduction commonly referred to as 6 dB per doubling of distance (FTA 2018).

Line source noise is generated by moving objects along a linear corridor. Highway traffic on a busy road is a good example of line source noise. However, noise from a single traveling vehicle is considered a point source noise. Line source noise levels are typically estimated over longer time periods such as the L_{eq} value rather than in maximum levels such as the L_{max} measured for point source noise. Only when noise comes from a very long continuous noise source such as a very long conveyor belt should the line source be represented by maximum event levels such as (L_{max}). Noise from a line source spreads cylindrically, spreading outward along the length of a line, but varies depending on the noise metric. Thus, the standard attenuation rate due to geometric divergence for line source noise is 3 dB per doubling of distance from the source for L_{eq} or L_{dn} noise levels, and at a rate of 3 to 6 dB per doubling of distance from the source for L_{max} noise levels (FTA 2018).

Noise Path Reduction Factors

Natural factors such as topography, vegetation, temperature, and relative humidity can further reduce noise over distance.

Ground absorption: Acoustically "hard" sites (i.e., sites with a smooth reflective surface along the direct sound path between the source and the receiver, such as paved parking lots or bodies of water) offer little or no ground attenuation due to acoustical absorption. "Soft" sites, on the other hand, are porous ground surface conditions characterized by loose soils, fresh-fallen snow, grass, or scattered bushes and trees that yield an excess ground attenuation value (i.e., over and above what geometric divergence already provides) of 1.5 dBA per doubling of distance (Crocker 2007), resulting in 7.5 or 4.5 dB/doubling of distance attenuation for point or line sources, respectively.

Atmospheric effects: Wind speed gradients can bend the path of sound to "focus" it on the downwind side and make a "shadow" on the upwind side of the source. At short distances, approximately up to 200 feet, the wind has minor influence on the measured sound level. For longer distances, the wind effect becomes

appreciably greater. Temperature gradients create effects similar to those of wind gradients, except that they are uniform in all directions from the source. On a sunny day with no wind, temperature decreases with altitude and tends to refract sound upwards into the atmosphere. On a clear night, temperature may increase with altitude, thereby refracting sound back towards the ground surface.

Shielding by natural and man-made features, noise barriers, diffraction, and reflection: A large object in the direct path between a noise source and a receiver can significantly attenuate noise levels at that receiver location. The amount of attenuation provided by this "shielding" depends on the size of the object and the frequencies of the noise levels—the lower the frequency, and hence the larger the wavelength, the less noise reduction the barrier provides. Natural terrain features such as hills and dense woods, as well as fabricated features such as buildings and walls, can significantly alter noise levels. Linear occlusion (i.e., a break in the line of sight between a noise source and receiver) due to natural terrain can generally reduce noise levels at the receiver up to 10 dBA for relatively close range receivers. Vegetation that is at least 15 feet in height and dense enough to obstruct line of sight between noise source and receiver can reduce noise levels at the receiver by up to 5 dBA for every 100 feet of vegetation, up to a maximum reduction of 10 dB over 200 feet (WSDOT 2018).

APPLICABLE VIBRATION CONCEPTS AND PRINCIPLES

Vibration is the periodic oscillation of a medium or object with respect to a given reference point. Sources of vibration include natural phenomena (e.g., earthquakes, volcanic eruptions, sea waves, landslides) and human activity (e.g., explosions; traffic; and operation of machinery, trains, or construction equipment). Vibration sources may be continuous (e.g., operating factory machinery) or transient (e.g., explosions).

Vibration amplitudes are commonly expressed in peak particle velocity (PPV) or root-mean-square (RMS) vibration velocity. PPV is defined as the maximum instantaneous positive or negative peak of a vibration signal. RMS is a measurement of the effective energy content in a vibration signal. PPV is typically used in the monitoring of transient and impact vibration and has been found to correlate well to the stresses experienced by buildings (FTA 2018). PPV and RMS vibration velocity are normally described in inches per second (in/sec).

Although PPV is appropriate for evaluating the potential for building damage, it is not always suitable for evaluating human response to vibration. The response of the human body to vibration relates well to average vibration amplitude. Therefore, vibration impacts on humans are evaluated in terms of RMS vibration velocity, and like airborne sound impacts on humans, vibration velocity can be expressed as vibration decibels (VdB).[6]

With respect to human perception and annoyance due to construction vibration activities, the FTA's Transit Noise and Vibration Impact Assessment technical manual provides human response and perception levels for ground-borne vibration (FTA 2018): typical human response to vibration levels between 65 VdB and 75 is barely perceptible; vibration levels between 75 VdB and 85 VdB are typically

[6] Vibration levels described in VdB are referenced to 1 microinch per second.

distinctly perceptible; and typical human response to vibration levels of greater than 85 VdB is tolerable only if daily events are infrequent (FTA 2018).

EXISTING NOISE AND VIBRATION SOURCES

The MRS is not used for residential or commercial activities and is therefore considered to be a Class C EDNA, as are the fuel tank farm to the south and EPA's Manchester Environmental Laboratory to the north (Table 4-4). Manchester State Park to the northeast is a recreational property used for hiking, camping, and picnicking, and is therefore considered a Class A EDNA. Parcels along Beach Drive East are zoned rural residential and are therefore considered to be Class A EDNA.

The ambient noise level in the vicinity of the NOAA property includes noise associated with facilities at the MRS, such as pumps and other mechanical equipment associated with the existing seawater processing and distribution system and research activities, periodic grounds maintenance, on-site traffic, and noise associated with the fuel tank farm to the south. In addition, noise can occasionally be heard from boat traffic in Puget Sound, including from the Seattle-Bremerton Ferry which passes through Puget Sound approximately 0.8 miles off the coast of the MRS.

Sensitive noise receptors typically include residential dwellings, schools, and hospitals, or other noise-sensitive land uses. Sensitive receptors nearest to the MRS are residences located along Beach Drive East, approximately 0.15 miles (approximately 800 feet) to the west and campgrounds at Manchester State Park, approximately 100 feet north from the edge of the LOD. These residential dwellings and campsites are shielded from the LOD by mature forest. No schools, hospitals, or other noise-sensitive land uses occur in the vicinity.

4.13.3 Environmental Consequences

PREFERRED ALTERNATIVE

Construction

Noise

Construction of the Preferred Alternative would occur in two phases: Phase 1 – Seawater Treatment and Distribution System and Phase 2 – New Buildings and Site Layout Alterations, each lasting approximately 12 months, for a total two-year-long construction period. Noise and vibration during construction would be generated from use of heavy construction equipment on the site, as well as from the increased movement of heavy trucks and worker commute traffic on nearby roads. Each of these noise sources are addressed in turn, below.

Both phases would require use of similar heavy construction equipment, such as cranes, backhoes, graders, dozers, and vibratory or sheepsfoot rollers. Noise generated during construction of the Preferred Alternative would be typical of other similar construction projects and associated primarily with operation of heavy construction equipment listed above as well as trucks transporting materials to or from the site. Reference noise levels for the types of heavy equipment proposed to be used during construction of the

Preferred Alternative are shown in Table 4-5, as well as the predicted combined noise level if the loudest pieces of equipment would operate simultaneously for 1 hour from a single acoustic point representing the geographic center of the construction area.

Table 4-5 Reference Noise Levels for Typical Construction Equipment

Equipment Type	Reference Emission Noise Level (L_{max}) at 50 feet from source[1]	Predicted Noise Level (L_{eq}) at 50 feet from source[2]
Roller	80 dBA	73 dBA
Backhoe	78 dBA	74 dBA
Concrete Saw	90 dBA	83 dBA
Crane	81 dBA	73 dBA
Grader	85 dBA	81 dBA
Concrete Mixer Truck	79 dBA	75 dBA
Concrete Pump Truck	81 dBA	74 dBA
Chainsaw	84 dBA	77 dBA
Combined Predicted Noise Level[2]	**-**	**87 dBA**

Source: [1]FHWA 2006. [2]Calculated by AECOM using general assessment methodology described in FTA 2018.

Combined construction noise was calculated for the nearest sensitive receptors for airborne noise: the campground at Manchester State Park and the closest residential properties on East Beach Drive (Table 4-6). The noise analysis conservatively assumes that the loudest pieces of equipment would operate simultaneously for 1 hour from a single acoustic point representing the geographic center of the nearest construction area for each phase. The campground is approximately 200 feet from the center of the Phase 1, Filter/UV System construction area, and approximately 400 feet from the center of the Phase 2, Building A construction area. The residences are approximately 800 feet from the center of the Phase 1, Filter/UV System construction area, and approximately 1,000 feet from the center of the Phase 2, Building A construction area.

Table 4-6 Predicted Noise Levels at Sensitive Receptors by Construction Phase

Sensitive Receptor	Predicted Noise Level during Phase 1	Predicted Noise Level during Phase 2
State Park Campground	75 dBA L_{eq}	69 dBA L_{eq}
East Beach Drive Residences	63 dBA L_{eq}	61 dBA L_{eq}

Source: Calculated by AECOM using general assessment methodology described in FTA 2018.

Noise impacts would be greatest for receptors nearest to the construction area, including patrons utilizing the facilities at Manchester State Park, and would be lesser for more distant receptors such as the residential houses along Beach Drive East. Maximum predicted noise levels experienced at the campsite and the nearest residence to the LOD are included in Table 4-6. It should be noted that the noise estimates in Table 4-6 are conservative; in reality noise levels would vary over time and space during the construction periods. Furthermore, the noise estimates do not account for the thick vegetation surrounding

the LOD, which would further dissipate construction noise by 5 to 10 dBA depending on the width and density of the forested buffer, or screening from topographical features which could reduce noise levels by up to 10 dBA if the line of sight is broken (WSDOT 2020).

The maximum predicted noise levels during Phase 1 construction at the campground (without accounting for screening from vegetation) could be up to 75 dBA, which is substantially above the maximum permissible noise limit of 60 dBA for Class A EDNAs (residential and recreational properties), and would generally be perceived as loud (refer Figure 4.13-1). Screening from vegetation could slightly reduce noise levels received at the campground; however, noise levels during Phase 1 could still exceed the maximum permissible noise limits. Construction during Phase 2 could generate noise levels up to 69 dBA at the campground, although the presence of more than 250 feet of forested land between the campground and Phase 2 construction areas could reduce perceived noise levels at this receptor by 5 to 10 dB.

The maximum predicted noise levels during construction at the nearest residences (without accounting for screening from vegetation) could be up to 63 dBA during Phase 1 and 61 dBA during Phase 2, which is only just above the maximum permissible noise limit of 60 dBA. Due to the presence of more than 400 feet of forested land between the LOD and these residences, actual noise levels at the residential receptors would not be anticipated to exceed the maximum permissible noise limit of 60 dBA for Class A EDNAs. The Kitsap County noise ordinance and state noise limits include an exemption for daytime construction noise (7:00 a.m. to 10:00 p.m.). Construction of the Preferred Alternative would generally be limited to daytime hours, although early starts could be required occasionally.

As discussed in more detail in Section 4.14, *Transportation,* construction of the Preferred Alternative is anticipated to require between 9 and 30 truck trips per day during Phase 1 and between 4 and 12 truck trips per day during Phase 2, as well as a maximum of 100 passenger vehicle trips per day throughout both phases due to construction workers commuting to the site. A doubling of traffic is typically required to cause a noticeable increase in traffic noise (Caltrans 2009). As discussed in Section 4.14, *Transportation*, Beach Drive East has an average daily traffic of up to 950 vehicles per day (Kitsap County 2020). Therefore, because construction-related traffic would not double the existing traffic levels on nearby roadways, there would be no perceptible change in traffic noise resulting from construction of the Preferred Alternative.

Contractors would also minimize construction noise to the extent practicable through the mitigation measures and standard BMPs identified in Section 4.13.4. Therefore, construction of the Preferred Alternative would result in *short-term, moderate adverse impacts* to the overall noise environment.

Vibration

Construction of both Phase 1 and Phase 2 would use vibratory construction equipment such as rollers, which have a reference vibration level of 94 VdB or 0.21 PPV inches per second at 25 feet from the source. Based on standard vibration dissipation equations (FTA 2018), this level of vibration would be expected to dissipate to 67 VdB within 200 feet, which is the approximate distance of the campground from the Filter/UV System construction area. The typical human response to vibration levels between 65 and 75 VdB is barely perceptible (FTA 2018). Furthermore, vibration is typically perceived more readily

within buildings (due to associated rattling noises) than outdoors. Vibration from truck traffic on roadways is typically confined to within the road right-of-way and therefore not anticipated to cause perceptible increase in vibration levels for sensitive receptors along the haul routes. Therefore, impacts from construction-related vibration would be *short term and negligible*.

Operation

Following completion of construction, changes to the noise and vibration environment would be negligible and not discernable to occupants of nearby residences or campsites. No new noise- or vibration-generating mechanical equipment would be required for the new seawater system, as it would utilize the existing pumps that drive the current system. The aeration head tank would generate some "white noise" from water passing through the aeration media; however, given the distance of this feature from sensitive receptors (approximately 550 feet from the campground and 900 feet from the closest residence) this new noise source is not anticipated to be perceptible at the receptors. Grounds maintenance activities would be expanded to occur in areas of the site that previously weren't maintained (e.g., at the Filter/UV System), but these would be short-term, occasional activities that are similar in nature to existing grounds maintenance activities elsewhere on the site.

Noise associated with the new buildings (e.g., heating/cooling systems and minor increase in traffic from additional staff and visitors) would be similar to existing and would not meaningfully increase noise or vibration levels at the site. Therefore, operations under the Preferred Alternative would have a *negligible long-term impact* to the overall noise environment and *no long-term impact* on vibration.

NO-ACTION ALTERNATIVE

Under the No-Action Alternative, the Proposed Action would not be implemented and there would be no change to baseline conditions in the short-term. In the long-term, existing operations would likely cease, resulting in a reduction in ambient noise levels in the vicinity of the site.

ACTION ALTERNATIVE 1

Construction

Noise and vibration impacts associated with construction of Action Alternative 1 would be similar to those described under the Preferred Alternative with the exception that the construction period would last for approximately half the time (one year). Under Action Alternative 1, only construction of the seawater treatment and distribution system would occur and none of the actions included in Phase 2 (e.g., construction of new buildings, relocation of existing structures, etc.) would occur. As such, construction-related noise impacts would be slightly less adverse when compared to the Preferred Alterative due to the construction period being reduced by approximately 12 months, and associated reduction in construction-related traffic. Construction activities would be implemented in accordance with mitigation measures and standard BMPs identified in Section 4.13.4 and construction would generally not occur during nighttime hours (10:00 p.m. to 7:00 a.m.), except for occasionally early starts, if needed. Therefore, similar to the Preferred Alternative, construction under Action Alternative 1 would result in *short-term, moderate adverse impacts* to the overall noise environment.

Operation

Noise and vibration impacts associated with operations under Action Alternative 1 would be similar to impacts discussed for the proposed seawater system under the Preferred Alternative and would not be discernable from baseline conditions for the nearest sensitive receptors. Action Alternative 1 would avoid the new noise sources associated with the Preferred Alternative's new building heating/cooling systems, grounds maintenance in additional areas of the site, or additional worker traffic. As previously discussed, the new seawater treatment and distribution system would generate noise at similar levels to the existing system. Therefore, operations under Action Alternative 1 would have a *negligible long-term impact* to the overall noise environment and *no impact* on vibration.

4.13.4 Mitigation Measures

PREFERRED ALTERNATIVE

The following are mitigation measures required to reduce impacts of the Preferred Alternative.

- **Mitigation Measure 4.13-1: Restrict construction hours.** Restrict noise-generating construction activities to between the hours of 7:00 a.m. to 10:00 p.m., where feasible.
- **Mitigation Measure 4.13-2: Preconstruction coordination and notification**. As discussed in Section 4.6, minimize noise impacts at the Manchester State Park campground through preconstruction coordination and notification with the State Parks Department.

In addition to the mitigation measures identified above, standard construction industry BMPs to limit noise impacts to the extent practicable would include:

- Route truck traffic away from residential areas and sensitive receptor locations such as schools or parks, to the extent practicable.
- Turn off equipment when not in use and prohibit unnecessary idling of internal combustion engines.
- Locate stationary noise-generating equipment such as air compressors or portable power generators as far as practicable from sensitive receptors.
- Equip all internal combustion engine-driven equipment with intake and exhaust mufflers that in are in good condition and appropriate for the equipment.

NO-ACTION ALTERNATIVE

No mitigation measures are required for the No-Action Alternative.

ACTION ALTERNATIVE 1

The same mitigation measures identified for the Preferred Alternative are required for Action Alternative 1.

4.14 TRANSPORTATION

This section describes the existing transportation facilities in the vicinity of the Proposed Action and evaluates the impacts of the Proposed Action on transportation. Transportation facilities include federal, state, and local roads, public transportation, sidewalks, and supporting infrastructure such as traffic signals. Impacts to be considered include changes in demand that would increase traffic volume and place additional stress on existing transportation infrastructure or changes to the transportation network that might introduce additional hazards. The study area consists of the roadways providing access to the MRS and other transportation facilities within a half-mile of the Proposed Action.

4.14.1 Regulatory Setting

FEDERAL AND STATE

There are no federal or state regulations pertaining to transportation that are applicable to the Proposed Action.

LOCAL

Kitsap County Comprehensive Plan

Kitsap County is the governing authority for transportation facilities and traffic in unincorporated areas of Kitsap County, as codified under Title 20 of the Kitsap County Code. The Kitsap County Comprehensive Plan establishes level of service standards for county roadways and prioritizes transportation improvements and maintenance projects (Kitsap County 2020).

4.14.2 Affected Environment

Access to the MRS is via Beach Drive East, either from the south through Manchester (from Mile Hill Drive via Colchester Drive) or from the west (from Mile Hill Drive via Woods Road and Beaver Creek Road). Beach Drive East is a two-lane county road classified as a minor arterial. Average daily traffic on Beach Drive East is low, with average daily traffic of up to 950 vehicles per day (Kitsap County 2020). There are no sidewalks or dedicated bike lanes along the road. It is the only direct route between Manchester and the NOAA property. Beaver Creek Road has narrow lanes, narrow soft gravel shoulders, and steep grades in places. Two curves on this road are sharp consecutive 90 degree turns with very limited sight distance and limited turning radii, especially for large trucks. Woods Road has minimal shoulder width and limited sight distance.

Because Beach Drive East is a county road, development on the road is subject to a concurrency test by Kitsap County to ensure that adequate transportation improvements or strategies are put in place to maintain the county level of service standards outlined in the Kitsap County Comprehensive Plan. Development approvals are contingent upon the receipt of a certificate of concurrency per Chapter 20.04 of the Kitsap County Code. Transportation impact fees are also assessed on new development in Kitsap

County. Impact fees are used to support development by funding new transportation facilities such as sidewalks, roads, and traffic signals.

Nearby highways under the jurisdiction of the Washington State Department of Transportation (WSDOT) include State Route 166 (Bay Street/Mile High Drive), approximately 3.5 miles to the southwest of the MRS, State Route 160 (Sedgwick Road), approximately 4.5 miles to the south of the MRS, and State Route 16, approximately 6 miles southwest of the MRS. State Route 304 (the Seattle-Bremerton ferry route, also operated by WSDOT) passes through the Rich Passage, approximately 4,000 feet east of the MRS.

There are approximately 45 parking spaces for staff and visitors at the MRS. Within the research station property, vehicle access and circulation has been developed informally over time. There are no sidewalks or bicycle facilities onsite. The entrance to the research station on Beach Drive East also provides access to EPA's Manchester Environmental Laboratory; as such, the two facilities share the main driveway from Beach Drive East through the NOAA property.

4.14.3 Environmental Consequences

PREFERRED ALTERNATIVE

Construction

During the installation and construction activities of the Preferred Alternative, roads near the MRS would need to accommodate truck traffic related to import of fill/export of excess spoils and equipment and material delivery, as well as construction worker commute trips. Construction of the Preferred Alternative would not require any work within or alteration to public roadways.

Construction-related traffic would be temporary and would vary over the construction period, depending on the level of construction activity occurring at the site. Construction of the replacement seawater treatment and distribution system is anticipated to begin in approximately August 2023 and would last approximately 12 months. Construction of the new buildings would not commence until after the new seawater treatment system has been completed and would also last approximately 12 months. Construction activities for both phases would generally be limited to normal daytime hours, Monday through Friday. Worker commute trips would be concentrated during peak a.m. and p.m. traffic hours, whereas truck traffic would occur throughout the workday.

The approximately 2,400 CY of imported fill material and 6,600 CY excess spoils generated during Phase 1 construction would require a total of approximately 1,200 truck trips[7] to and from the NOAA property during this phase. This equates to an average of approximately 9 truck trips per workday over the 12-month duration of this phase, or up to 30 truck trips per workday (3 to 4 trips per hour) if material haul trips were concentrated over a 2-month duration. The number of construction workers would vary

[7] Truck trips calculated by dividing total haul volume by 15 CY capacity of an average dump truck, and then doubling to account for return trips for empty trucks.

throughout construction. It is anticipated the maximum number of construction workers on site at any one time would not exceed 50 workers, resulting in approximately 100 additional passenger vehicle movements per day[8] during peak periods of Phase 1 construction.

Following the completion of the replacement seawater treatment and distribution system, construction on the new buildings and other site improvements would begin. Similar to Phase 1, this would result in an increase in heavy truck traffic and worker commute vehicles using local roads and accessing the NOAA property. The estimated 3,700 CY of excess spoils to be disposed of during Phase 2 would require approximately 500 truck trips to and from the NOAA property. This equates to an average of just less than 4 truck trips per day over the 12-month duration of this phase, or approximately 12 truck trips per day if material haul trips were concentrated over a 2-month duration. Similar to Phase 1 construction, the number of workers would vary over time but are not anticipated to exceed 50 workers at one time, resulting in approximately 100 additional passenger vehicle movements per day during peak periods of Phase 2 construction.

The anticipated volume of construction-related traffic would not be substantial compared to existing traffic volumes on Beach Drive East but would represent a substantial increase in traffic using the private road through the NOAA property (which also serves the EPA research facility to the north). NOAA staff would continue to work at the research station during the installation of the new seawater treatment and distribution system and the construction of the new buildings, and EPA staff would continue to use the private road through the NOAA property to access the EPA research facility to the north. As described previously, Beaver Creek Road and Woods Road have limited sight distances, narrow lanes or shoulders, and/or sharp curves which are not suitable for large trucks. Haul routes for the Preferred Alternative would avoid use of these roads by trucks, and instead would route truck traffic south along Beach Road East towards Colchester and Mile Hill Roads.

Construction of the replacement seawater treatment and distribution system in Phase 1 would require trenching across the main driveway just northeast of Building 13, along the main driveway in the vicinity of proposed Buildings B and C, and along the northern edge of the main parking lot. The driveway along the coastal edge of the NOAA property would also be trenched for installation of trunk lines and overflow pipelines.

Vehicle circulation within the site would be reorganized during Phase 2, as the existing entrance to the main parking lot from the main driveway would be blocked by the construction of Building B. The new entrance and exit for the main parking lot would be constructed and made operational prior to demolishing the existing entrance and construction of Building B.

The additional traffic, in-road trenching activities during Phase 1, and site access improvements during Phase 2 could cause temporary disruptions to NOAA and EPA staff and visitors and/or emergency services, and potential traffic safety issues if not managed appropriately. With implementation of the

[8] Daily vehicle trips calculated by doubling the number of construction workers, based on assumption that each worker would drive to the construction site in the morning and drive home in the afternoon.

mitigation measures outlined in Section 4.14.4 below, construction of the Preferred Alternative would have a *minor, temporary adverse impact* to transportation.

Operation

During the operation of the Preferred Alternative, traffic on surrounding public roads would be similar to existing conditions. The Preferred Alternative would support approximately 6 additional permanent staff, as well as up to ten additional daily or weekly visitors on an occasional basis. There would be approximately 48 vehicle parking spaces onsite for staff and visitors (i.e., approximately 3 more spaces than currently exist). Furthermore, the site contains ample open space that could be utilized for informal parking if needed; no offsite parking would be necessary. The volume of deliveries to the site would not change substantially. Vehicle circulation on site would also be improved with a new one-way entrance to, and separate one-way exit from, the main parking lot that would reduce potential conflicts between vehicles entering and exiting the site, as well as new driveways to serve the proposed new buildings.

The minor increase in traffic associated with operation of the Preferred Alternative is not anticipated to affect the current level of service on Beach Drive East. Overall, the impact on traffic and other transportation resources would be negligible given the magnitude of the Proposed Action and the capacity of the affected roads to accommodate a minor increase in vehicular traffic due to staff changes and expected deliveries and visitors. For these reasons, the Preferred Alternative would not interfere with the movement of public goods, such as agriculture and forest products. Operation of the Preferred Alternative would have a *negligible long-term impact* to transportation.

NO-ACTION ALTERNATIVE

The No-Action Alternative would involve no construction activities and no increase in staff numbers or intensity of site use. Because there would be no physical changes at the site, and no increase in traffic generation, no impacts to transportation would occur under the No-Action Alternative.

ACTION ALTERNATIVE 1

Under Action Alternative 1, the proposed replacement seawater treatment and distribution system would be installed at the site (as described for the Preferred Alternative), however, no new buildings would be constructed and no changes to the on-site roadways, parking, or landscaping would occur. As such, the duration of construction-related impacts to transportation would be shorter than the duration of impact under the Preferred Alternative. For the same reasons described for the Preferred Alternative, and with implementation of the same BMPs described in Section 4.14.3 below, construction activities from the seawater treatment and distribution system replacement would have a minor, temporary adverse effect on transportation resources.

Operation of Action Alternative 1 would not accommodate or require additional staff and an increase in visitors or deliveries to the research station would not occur. Therefore, the operation of Action Alternative 1 would have no impact on transportation.

4.14.4 Mitigation Measures

PREFERRED ALTERNATIVE

The following are mitigation measures required to reduce impacts of the Preferred Alternative.

- **Mitigation Measure 4.14-1: Utilize a designated haul route.** Construction-related truck traffic shall utilize the preferred haul route along Beach Drive East and Colchester Road to Mile Hill Road. Heavy construction vehicle and equipment movement shall be minimized during peak rush hours.
- **Mitigation Measure 4.14-2: Preconstruction coordination and notification.** The construction contractor shall meet with site operations personnel at NOAA and EPA to coordinate time windows and durations of internal roadway closures necessary for construction activity.
- **Mitigation Measure 4.14-3: Develop a roadway closure and traffic detours plan.** This plan shall be developed with consultation and approval from site operations personnel at NOAA and EPA. Additional temporary parking needs shall be addressed as well as allowable time windows and the duration of roadway closures for various stages of construction.

In addition to the mitigation measures identified above, standard traffic management BMPs to limit transportation impacts to the extent practicable would include:

- Providing early notification to staff and visitors about upcoming construction and expected disruptions to traffic flow.
- Utilizing signage to indicate detours or road closures, where applicable.
- Avoiding obstructions to pedestrian areas and provide clear pedestrian walkways if obstructions cannot be avoided.

NO-ACTION ALTERNATIVE

No mitigation measures are required for the No-Action Alternative in relation to transportation.

ACTION ALTERNATIVE 1

The same mitigation measures and BMPs for construction traffic identified for the Preferred Alternative are required for Action Alternative 1 in relation to transportation.

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4.15 UTILITIES AND SOLID WASTE

This section describes utilities and solid waste services at the NOAA property and evaluates the impact of the Proposed Action on utilities and solid waste in the project area. Factors to be considered include direct changes to physical facilities or the operations of utility service providers and potential changes in the demand for or quality of public utilities. The study area, roughly the community of Manchester and the surrounding unincorporated areas of Kitsap County, includes the service areas of several public utility providers. This assessment considers the apparent capacity of utility services and the effects of extending those services to the Proposed Action.

4.15.1 Regulatory Setting

There are no directly applicable federal, State, or local regulations pertaining to effects of federal actions on local utilities and public services (i.e., solid waste disposal). Regulatory constraints related to the existing capacity and distribution of utility services is typically considered through local zoning or land use law. While the federal government is not required to follow local regulations under the Public Building Amendments of 1988 (Public Law 100-678), it strives to assess potential effects of projects and conform to local requirements to the extent practicable.

4.15.2 Affected Environment

The community of Manchester is serviced by multiple utility providers. Solid waste and refuse service is provided by the Waste Management of Washington Inc. Northwest Division for curbside collection of garbage, recycling, and yard/food waste for all residents and businesses. Water services are provided by Manchester Water District and sewer services are provided by the Kitsap County Public Works Division. Electricity services are provided by Puget Sound Energy.

The buried telephone lines and overhead power lines providing electricity and telephone service to the research station are connected to distribution lines at the research station entrance on Beach Drive East. These utilities run from the site entrance to the research station buildings, within the main entrance road right-of-way. Potable water is pumped through underground water lines to the site and is supplied from underground wells throughout the Manchester Water District service territory. Water for the seawater tanks is sourced from Clam Bay using the existing seawater intake and distribution system. A diesel engine back-up generator in Building 9 powers the tanks and associated equipment during an electrical outage event. Natural gas lines owned by Cascade Natural Gas run through an easement on the western and northern sides of the property to service the neighboring EPA Manchester Environmental Laboratory, however, the MRS itself does not use natural gas services.

Currently, MRS's primary energy consumption is for the seawater intake system and tank circulation systems (pumps, filters, etc.), as well as typical laboratory and office space energy uses (lighting, heating, ventilation, etc.). Power provided by Puget Sound Energy is generated from natural gas (27%), hydroelectric (24%), coal (23%), wind (11%), solar (1%), and other unspecified sources (14%) (PSE 2020).

4.15.3 Environmental Consequences

PREFERRED ALTERNATIVE

Construction

During construction of the new seawater treatment and distribution system, existing site operations, including the operation of the current system, would continue as normal until the new system is operational. Minor disruptions to electrical and communications services at the research station may be necessary to connect the new buildings to electricity and communications lines.

Minor disruptions to utility services at the research station may be necessary to connect the new buildings to electricity, potable water, sanitary sewer, and communications lines. The precise locations of the proposed utility connections for the new buildings have not yet been determined. It is assumed that all construction activities would be powered by diesel fuel (e.g., via generators), although it is possible that the contractors may connect to existing electrical power on-site to power some equipment. Construction and demolition waste would be reused on-site to the extent possible with materials unsuitable for reuse taken to a transfer station or discarded to the appropriate landfill. Overall, construction activities would have a *temporary, negligible adverse impact* on utilities and solid waste from additional utilities demand, solid waste generation, and potential brief utility service disruptions to NOAA personnel.

Wastewater discharge associated with construction, such as dewatering, is discussed within Section 4.5, *Water Resources and Hydrological Processes*. Hazardous waste is discussed in Section 4.17, *Hazardous Materials*.

Operation

The Preferred Alternative would operate in a similar fashion as existing operations at the site. Electricity required to operate the seawater treatment and distribution system would be approximately the same as under existing conditions. The existing electrical system[9] has sufficient capacity to accommodate the loads associated with the proposed treatment and distribution system (Burns McDonnell 2022). The diesel backup generator in Building 9 would be available for use during an outage event. An uninterruptible power supply system would be installed on all UV filter equipment, which would be capable of keeping the equipment operational for up to 15 minutes while the standby generator comes online during an outage.

Electrical services would also be required for the operation of the new buildings for lighting, heating, electronics, security systems, and other associated uses. Overall, the demand for electrical services at the site would increase slightly due to the operation of four new buildings.

[9] The existing electrical system at the site is currently undergoing an upgrade unrelated to the Proposed Action described in this EA. The analysis within this EA assumes that the electrical upgrade project will have been completed prior to construction of the Proposed Action.

Any change in demand for utilities such as water and wastewater services would stem primarily from domestic water use in the newly constructed buildings. Wastewater generated by these office uses would be discharged to the local sanitary sewer and treated at the local wastewater treatment plant.

Water for the new seawater tanks and experiments within the proposed new buildings would be sourced from Clam Bay, pumped in by the existing intake pipelines, with only negligible amounts of domestic potable water used. Water from the tanks would be discharged to Clam Bay via the existing outfall pipeline. The Preferred Alternative's demand for water and wastewater services would not substantially increase as future operations would be similar to existing operations; although four new buildings would be operational, only six new permanent staff would join the research station.

Solid waste generation would increase slightly compared to existing operations and would consist primarily of office and laboratory wastes generated by the six new permanent staff and additional temporary visitors.

Overall, the slight increase in demand for electricity, water, wastewater, and solid waste disposal would be within the capacity of current utility providers and would not be noticeable to other users of those providers. Therefore, operation of the Preferred Alternative would have a *long-term, negligible adverse impact* on utilities and solid waste from slightly increased utility demand and solid waste generation from the four new buildings and associated staff.

NO-ACTION ALTERNATIVE

The No-Action Alternative would involve no construction activities and no increase in staff numbers or intensity of site use. Because there would be no physical changes at the site, no impacts to utilities and solid waste would occur under the No-Action Alternative.

ACTION ALTERNATIVE 1

Action Alternative 1 would only require the installation of a new seawater treatment and distribution system. No new buildings would be constructed. During construction, existing site operations, including operation of the existing seawater treatment and distribution system, would continue as normal until the new seawater treatment and distribution system is operational. Under Action Alternative 1, changes in demand for electricity, potable water, sanitary sewer, and communications would be negligible, as operations would effectively be unchanged from current operations.

4.15.4 Mitigation Measures

No mitigation measures are required for the Preferred Alternative, No-Action Alternative, or Action Alternative 1 in relation to utilities and solid waste.

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4.16 VISUAL RESOURCES

This section describes the existing visual resources at the NOAA property and evaluates whether the Proposed Action would conflict with or detract from the visual resources of the existing environment. Visual resources may include structures, landforms, water bodies, vegetation, and other natural or manmade features and landscapes that are visually distinct or culturally significant. Assessment of visual resources may also include an evaluation of the scenic experience of viewers, which may consider the number of likely viewers, viewer activities, and viewer concerns for aesthetics (BLM 2022). Consequently, visual impacts include changes to visual resources that would negatively or positively affect the visual resource itself or the scenic experience of the viewer (Sullivan 2018).

4.16.1 Regulatory Setting

FEDERAL

Federal Land Policy and Management Act of 1976

The Federal Land Policy and Management Act, 43, USC Section 1701 (a)(8) states that public lands must be managed in a manner that will protect the quality of the scenic values. Additionally, Section 1701(c) identifies scenic values as a resource that should be managed by the public.

Bureau of Land Management's Visual Resource Management System

The Bureau of Land Management developed a system for analysis of visual effects on federal lands. This system is called Visual Resource Management, which involves inventorying scenic values and establishing management objectives for those values. While Visual Resource Management is typically applied to large federal landholdings requiring an EIS, these concepts can be applied to provide a basis for assessing effects within an EA for less expansive federal actions proposed on non-federal land parcels.

Visual/scenic resources, such as national, state or local parks, areas adjacent to designated wild and scenic rivers, and regionally scenic byways, routes or views from designated viewing areas have a social setting, which includes public expectations, values, awareness, and concern regarding visual quality. This social setting is addressed as "visual sensitivity," and is important to assessing how important a visual impact may be and whether it represents a significant impact.

STATE AND LOCAL

There are no State or local regulations pertaining to visual resources that are applicable to the Proposed Action.

4.16.2 Affected Environment

The NOAA property is approximately one mile north of Manchester, between the Manchester Fuel Depot and Manchester State Park. The area of the Preferred Alternative extends inland to the west from the north-south-oriented Clam Bay shoreline. The viewshed includes EPA's Manchester Environmental

Laboratory and EPA pier, the shoreline areas of the Navy property, forested areas of Manchester State Park, Clam Bay, and the Puget Sound.

Buildings and structures at the NOAA property are one and two stories tall and have mostly been arranged in an ad-hoc fashion on the southeastern portion of the site. The buildings are generally in a state of good repair. Landscaping on the site consists of mowed grass and tree and shrub plantings near some of the buildings. Tanks, equipment storage, and utilities for the seawater treatment and distribution system are visible throughout the property. The western side of the property, and the adjacent property to the south, is densely forested, which obstructs views of the research station from Beach Drive East, a public road that is approximately 500 feet from the developed portions of the property.

Public views of the research station are limited by the surrounding land uses. The Navy property has rocky, forested shoreline that is not accessible to the public, limiting public views of the research station from the south. Manchester State Park borders the research station to the north, and a campground in the park is located approximately 100 feet from the LOD. The NOAA property is visible from this campground; however, the view is heavily obstructed by a forest and dense vegetation between the campground and the developed portions of the research station.

The NOAA property faces Clam Bay to the east. The research station is visible to passengers on the Seattle-Bremerton ferry, which passes roughly every two hours. The southern end of Bainbridge Island is located across Clam Bay roughly 1.5 miles from the research station. As such, members of the public utilizing public spaces along the coastline of Bainbridge Island near Beans Point or the southern coastline of Fort Ward Park may have distant views of the research station depending on weather conditions. Views of the research station from publicly accessible areas further inland on Bainbridge Island are generally obstructed or partially obstructed by vegetation, coastal development, and/or topography.

4.16.3 Environmental Consequences

PREFERRED ALTERNATIVE

Construction

Short-term construction impacts would occur in two, 12-month phases, beginning with the construction of the new seawater intake and distribution system in August 2023 and followed by the construction of four new buildings. Nighttime construction is generally not proposed except in limited circumstances (e.g., early starts or late finishes), therefore any nighttime lighting required during the construction period would likely occur around dawn and dusk. Short-term visual impacts due to construction activity would not be visible by the public except potentially from the transiting ferry or from across Clam Bay. Further, these impacts would be temporary in nature and not result in substantial adverse effects to the scenic quality or visual resources of the area. Impacts from construction would be *temporary and negligible*.

Operation

Long-term impacts to the key viewsheds would largely be indiscernible from existing conditions during operation of the new facilities under the Preferred Alternative. Replacement of the seawater intake and

distribution system would not alter the site's visual resources, as the seawater intake and distribution system would be generally imperceptible from public viewpoints on Clam Bay and in Manchester State Park.

The four buildings proposed as part of the Preferred Alternative are planned as infill development, meaning the proposed buildings would mostly be constructed on previously disturbed portions of the property. The proposed buildings would be single-story (25 feet tall maximum), metal-frame construction with concrete foundations, which is consistent with the character of the existing buildings at the site. Buildings B, C, and D would be constructed to the west of most existing buildings and would therefore generally be out of view from Clam Bay. Building A would be constructed on an area that is partially vegetated and would be visible from Clam Bay.

New pole-mounted LED lights would be installed to illuminate the proposed facilities. Lighting would be directed downward and/or shielded to avoid light spill onto adjacent properties.

Overall, the increased building density at the research station would result in a modest change to the site layout, but the new construction would be consistent with existing visual quality of the property. Because the visual quality of the site would not be significantly altered and public views of the site are generally limited and distant, operation of the Preferred Alternative would have a *negligible long-term impact* on visual resources.

NO-ACTION ALTERNATIVE

The No-Action Alternative would involve no construction activities and no increase in staff numbers or intensity of site use. Because there would be no physical changes at the site, there would be no effect on visual resources under the No-Action Alternative.

ACTION ALTERNATIVE 1

Action Alternative 1 would only require the installation of a new seawater treatment and distribution system and associated lighting, as described for the Preferred Alternative. No new buildings would be constructed. Since the proposed seawater treatment and distribution system would be generally imperceptible from public viewpoints, there would be no impact to visual resources.

4.16.4 Mitigation Measures

No mitigation measures are required for the Preferred Alternative, No-Action Alternative, or Action Alternative 1 in relation to visual resources.

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4.17 HAZARDOUS MATERIALS

This section describes known and potential hazardous materials at the NOAA property and evaluates impact of the Proposed Action associated with potential impacts due to contact with hazardous materials. Factors to be considered include contact by construction workers with hazardous materials present in soil or groundwater, migration of impacted soil or groundwater to adjacent off-site areas, or other potential exposures to hazardous materials present on site. The description of hazardous materials potentially present on site is based on review of site investigations, remedial action reports, and similar documentation.

4.17.1 Regulatory Setting

FEDERAL

Resource Conservation and Recovery Act, Comprehensive Environmental Response, Compensation and Liability Act, and Emergency Planning and Community Right-to-Know Act

The EPA is responsible for implementing and enforcing federal laws and regulations pertaining to hazardous materials, including hazardous wastes. The primary legislation includes the Resource Conservation and Recovery Act of 1976 and the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act and the Emergency Planning and Community Right-to-Know Act. The purpose of Comprehensive Environmental Response, Compensation, and Liability Act is to identify sites where hazardous materials threaten the environment and/or public health, identify the responsible party, and then remediate the site and ensure the responsible party is held responsible. These sites are referred to as Superfund Sites, which are listed on EPA's National Priorities List.

Hazardous materials storage and reporting requirements, known as Tier II Requirements, have been delegated to the States by the EPA.

Hazardous waste must be transported, treated, or disposed of in accordance with the Resource Conservation and Recovery Act of 1976 regulations which require the hazardous waste (referred to as dangerous waste under Washington State law) to be tracked using a Uniform Hazardous Waste Manifest (EPA Form 8700-22). Sites that generate over 220 pounds of hazardous waste, or that accumulate over 2200 pounds of hazardous waste at any one time, require a Resource Conservation and Recovery Act of 1976 Site ID Number and filing of an application (referred to as Dangerous Waste Site Identification Form) with Ecology.

US Department of Labor, Occupational Safety and Health Administration

The Occupational Safety and Health Administration (OSHA) of the U.S. Department of Labor is responsible for implementing and enforcing federal laws and regulations that address worker health and safety. OSHA requires training for those using or otherwise handling hazardous materials. Training is to include procedures for personal safety, hazardous-materials storage and handling, and emergency response.

OSHA has developed Hazardous Waste Operations and Emergency Response Standards to protect workers at hazardous sites. In general, workers involved in the investigation and/or cleanup of contaminated sites need to have completed the appropriate Hazardous Waste Operations and Emergency Response Standards training.

Code of Federal Regulations, Titles 29 and 40

Regulations in CFR Title 29 include requirements to manage and control exposure to lead-based paint and asbestos-containing materials. OSHA is the agency responsible for assuring worker safety in the workplace, including safety during construction activities that may result in exposure to hazardous materials. Federal OSHA also has an asbestos survey requirement under Title 29 CFR, which require facilities to take all necessary precautions to protect employees and the public from exposure to asbestos.

The removal and handling of asbestos-containing materials is governed primarily by EPA regulations under CFR Title 40. The regulations require that the appropriate State agency be notified before any demolition, or before any renovations, of buildings that could contain asbestos or asbestos-containing materials above a specified threshold.

STATE

Underground Storage Tank Regulations (WAC 173-360)

Owners and operators of underground storage tank (UST) systems must comply with the Washington State UST regulations which govern the installation, operation, and closure of USTs (known or discovered). The regulatory requirements for releases from regulated UST systems containing petroleum products are outlined in this regulation. In general, regulated UST systems include any tank or combination of tanks and connecting piping storing over 110 gallons of regulated hazardous substances (including gasoline and diesel fuel). There is an exemption for heating oil tanks with a capacity of 1,100 gallons or less. UST systems that were not operated after January 1, 1974 and were removed before May 8, 1986 do not need to comply with UST system requirements. However, the reporting and cleanup of releases from these and other exempt UST systems must still comply with the Model Toxics Control Act (MTCA), described below.

Model Toxics Control Act (WAC 173-340)

In general, MTCA requires cleanup actions at a site where any of the following conditions exist:

- Free product (light non-aqueous phase liquid) is identified on the groundwater table;
- Hazardous substances are present in groundwater exceeding the MTCA groundwater cleanup standards established for the site;
- Hazardous substances are present in the soil exceeding the MTCA soil cleanup standards established for the site; and
- Hazardous substances are present in other media (e.g., surface water, sediment, indoor air, etc.) in excess of applicable MTCA cleanup standards for that media.

Cleanup actions at petroleum-contaminated sites must comply with the cleanup standards described in WAC 173-340-700 through 173-340-760 and the requirements for the selection of cleanup actions in WAC 173-340-350 through 173-340-390. The MTCA cleanup regulations specify certain threshold and other requirements as the minimum requirements that all cleanup actions must meet. Cleanup actions must (WAC 173-340-360): protect human health and the environment; comply with cleanup standards; comply with applicable state and federal laws; use permanent solutions to the maximum extent practicable; provide for a reasonable restoration time frame; provide for compliance monitoring; and consider public concerns.

The MTCA cleanup regulations do not require a permit from Ecology to cleanup a site. However, excavations, soil treatment, and other activities related to site cleanups may require permits from local planning, building, health, or fire departments, as well as regional air pollution control authorities and state agencies other than Ecology.

Dangerous Waste Regulation (WAC 173-303)

The State's Dangerous Waste Regulation (WAC 173-303) defines dangerous waste and outlines specific requirements for the generation, treatment, storage, and disposal of dangerous wastes. Dangerous wastes can be transported only to specifically permitted facilities for treatment, storage, or disposal. Soils and groundwater contaminated by releases from regulated USTs are exempt from most of the dangerous waste regulations under WAC 173-303-071(3)(t). However, the contents of tanks, and petroleum contaminated soils generated by other petroleum cleanups, are not exempt from the dangerous waste regulations.

Solid Waste Handling Standards (WAC 173-350)

Petroleum-contaminated soils that are not classified as dangerous wastes under WAC 173-303 are regulated under the Solid Waste Handling Standards (WAC 173-350). This rule applies to the handling of contaminated soil when removed from a site complying with MTCA cleanup regulations.

Water Quality Regulations (WAC 173-220)

State law requires a water quality discharge permit if water from a hazardous chemical/Dangerous Waste or petroleum contaminated site is discharged to surface water or groundwater. There are four options for discharge of contaminated water from cleanup sites:

1. Treatment and discharge to surface water. Discharge of contaminated water from a point source to State surface waters (including storm drains), requires a NPDES permit. Applications must be submitted no later than 180 days prior to the planned commencement of discharge. Rules governing these types of discharges require monitoring and reporting of effluent quality and providing treatment for wastewater. Construction and cleanup activities that disturb the land and result in stormwater leaving the site and discharging to surface water also require a construction stormwater permit.
2. Pretreatment and discharge to sanitary sewer. Discharges to a municipal sewer system require a pretreatment permit (WAC 173-216). These permits are either issued by Ecology, or by the local treatment system operator (Kitsap County Public Works).

3. Treatment and discharge to ground and groundwater. Discharges to ground and groundwater, whether contained on-site or released off-site, may require a State Waste Discharge Permit. These permits are issued by Ecology's regional offices. Local conditions and the method of discharge and containment will determine the need for the permit. Applications must be submitted at least 60 days prior to discharge.
4. Transport to a permitted industrial wastewater treatment facility. Contaminated pump water, purge water, or extracted groundwater can also be stored on-site and transported to a facility permitted to receive industrial wastewaters. For water designated as Dangerous Waste, a permitted, hazardous waste treatment facility must be used. If dewatering is required during the future site foundation installation activities, the pumped water will require appropriate handling, treatment and disposal/discharge.

Water Quality Standards for Surface Waters (WAC 173-201A)

Water quality standards for surface waters of the state of Washington are established by Ecology under WAC 173-201A, consistent with public health and public enjoyment of the waters and the propagation and protection of fish, shellfish, and wildlife.

LOCAL

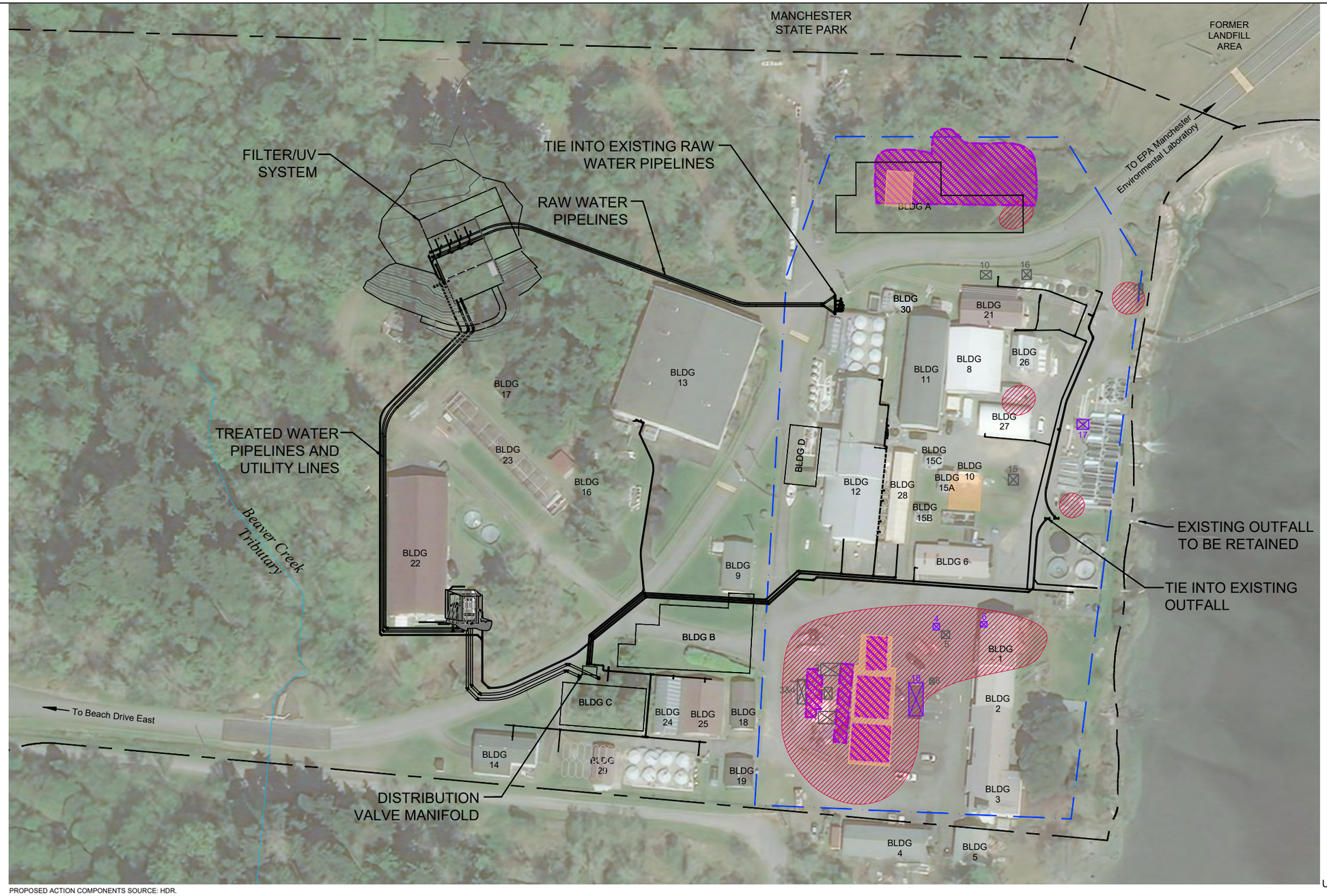
Kitsap County Stormwater Design Manual

Volume II, Chapter 2 of the County's *Stormwater Design Manual*, effective October 4, 2021 (Kitsap County 2021) provides stormwater pollution prevention measures, including spill prevention for hazardous materials, for construction projects in Kitsap County, and is intended to be used in conjunction with Ecology's Stormwater Management Manual for Western Washington (Ecology 2019). The manual applies to construction activities that require a permit or approval from the Kitsap County Department of Community Development. As with all local permitting and regulatory processes, NOAA as a federal agency would comply with Kitsap County's stormwater guidelines to the maximum extent practicable, as defined under the Public Buildings Amendments of 1988.

4.17.2 Affected Environment

EXISTING CONTAMINATION

The NOAA property is the southern 22 acres of the 53-acre Manchester Superfund Site (CERCLIS ID Number WA 8680030931) which is also referred to as: "Old Navy Dump/Manchester Lab (USEPA/NOAA)"; "Old Navy Dumpsite/Lab USEPA/USNOAA"; and "USENOAA Old Navy Dump/Manchester Laboratory". The Manchester Superfund Site was owned and operated by the Navy for submarine net maintenance, fire training, and waste disposal activities. NOAA acquired the southernmost 22 acres of the Manchester Superfund Site in the early 1970s (EPA 2022a). The site of interest for this EA is the former fire training area, which comprises approximately 4.7 acres in the easternmost portion of the NOAA property (Figure 4.17-1). A capped landfill that is also associated with the Manchester Superfund Site is present on the adjacent land to the northeast (on EPA-owned property).



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SCALE IN FEET

LEGEND

- UST - POTENTIALLY INTACT
- UST - CLOSED OR REMOVED
- PROPERTY BOUNDARY
- PROPOSED ACTION COMPONENTS
- FORMER FIRE TRAINING AREA
- SIMULATOR FOUNDATION
- APPROXIMATE AREA OF REMAINING PETROLEUM CONTAMINATED SOILS
- APPROXIMATE EXCAVATION AREA FROM PREVIOUS REMEDIATION ACTIONS

EXISTING BUILDINGS KEY

1 - MAIN BUILDING
2 - MAIN BUILDING
3 - MAIN BUILDING
4 - NAVY ANNEX I
5 - NAVY ANNEX II
6 - PATHOLOGY LAB
8 - WAREHOUSE
9 - EMERGENCY POWER GENERATOR
10 - CHEMICAL STORAGE CONTAINER
11 - FISH REARING
12 - SALTWATER MARINE LAB
13 - BPA
14 - FISH BEHAVIOR LAB
15A - OZONE GENERATOR
15B - OXYGEN GENERATOR
16 - ELECTRICAL SUPPORT STREAM CHANNEL
17 - SUPPORT FOR STREAM CHANNEL
18 - RECIRCULATION FOR B14
19 - MARINE FISH
21 - KENNETH CHEW CENTER
22 - NOOKSACK
23 - SALMON STREAM
24 - STORAGE & KELP LAB
25 - BEHAVIOR ECOLOGY - COVERED TANKS
26 - ALGAE GROWING BUILDING
27 - ALBALONE AND SEA CUCUMBER NURSERY
28 - TARP COVERED WORK AREA
29 - COVERED STORAGE
30 - QUONSET HUT PUMP HOUSE

UST - UNDERGROUND STORAGE TANK

PROPOSED ACTION COMPONENTS SOURCE: HDR.
CONTAMINATION AND REMEDIATION AREAS SOURCE: USACE 2009::USACE 2021.
IMAGERY SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY

EXISTING PETROLEUM CONTAMINATION AND PREVIOUS REMEDIATION AREAS

NOAA NWFSC MANCHESTER RESEARCH STATION
SEAWATER SYSTEM REPLACEMENT AND CAMPUS ADDITION PROJECT
MANCHESTER, WASHINGTON

NOVEMBER 2022
60680959

AECOM

FIGURE 4.17-1

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The fire training area was reportedly used from the 1940s to the early 1970s to train personnel to extinguish Naval vessel fires. Large concrete structures known as "simulators" were used to simulate ship compartments (USACE 2009), in which fires were started and then extinguished for training. Associated subsurface equipment included USTs for gasoline, diesel, and waste oil; vaults (e.g., valve boxes); fuel lines; and water lines. The fire training activities resulted in releases of hazardous materials and petroleum products. Constituents of concern associated with these operations include polychlorinated dioxins and furans (hereafter called dioxins/furans) and petroleum hydrocarbons (USACE 2019). The former Navy Fire Training Area has been the focus of various hazardous materials investigations and remedial actions and is subject to Institutional Controls (described in more detail below).

In 1998, a removal action was performed to remove diesel fuel distribution piping and petroleum saturated soil and heavy stained soils from an area within the main MRS parking lot (USACE 2009; 2019). Soil was removed from between 6 to 8 feet below ground surface and backfilled with clean soil. The simulator structures and associated debris were removed in the 1998 remedial action, along with excavation of dioxin-impacted soils to a depth of approximately 6-inches below ground surface (USACE et al 2012). Total petroleum hydrocarbon (TPH)-contaminated soils were left in place (Figure 4.17-1).

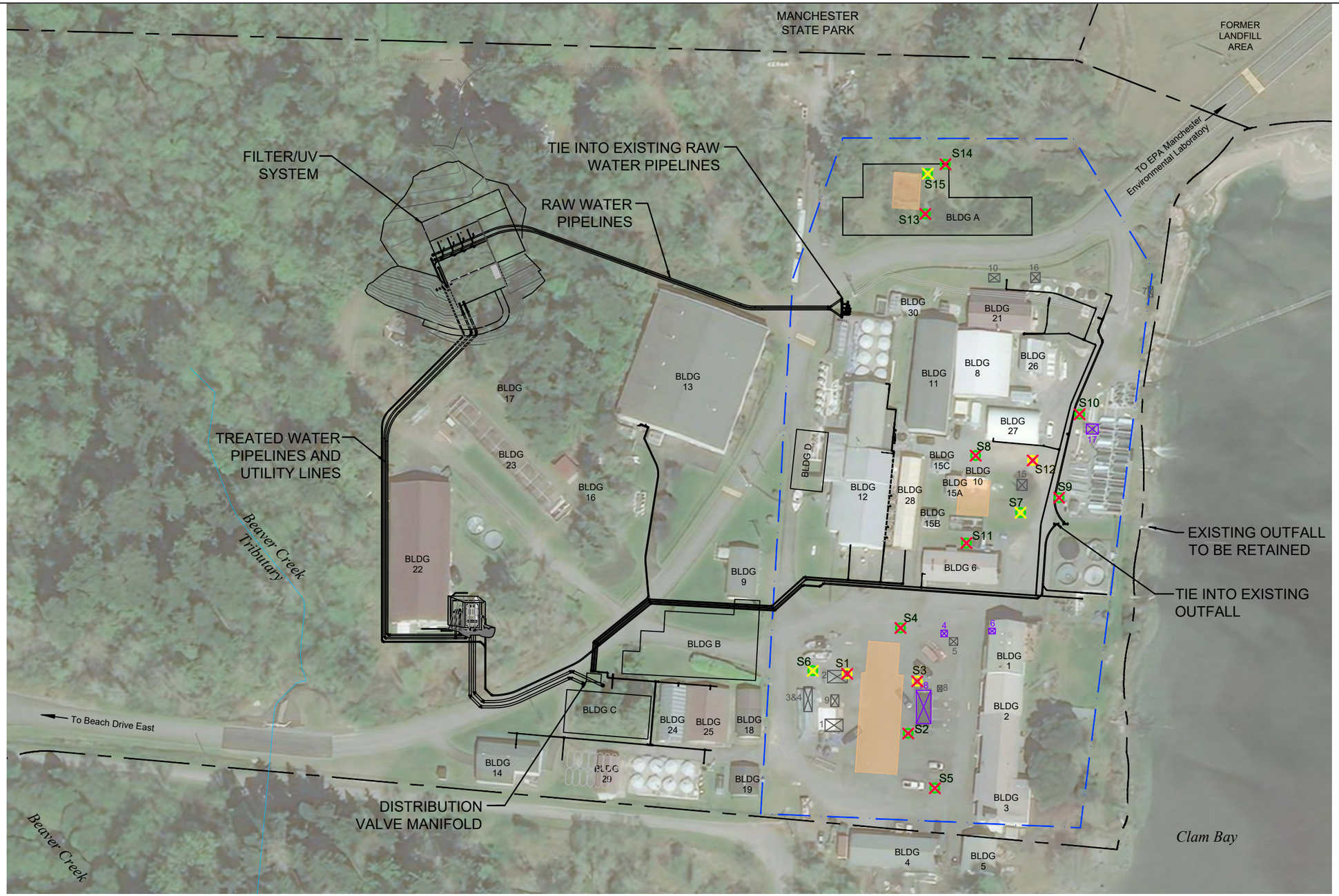
Thirteen USTs which contained petroleum products were closed in accordance with state UST closure requirements and associated piping removed or plugged between 1994 and 2000. Four other underground concrete structures (referred to as USTs in previous reports but which appear to have been used for water storage not for petroleum products or other hazardous materials), remained present on site as of 2009 (USACE 2009). The remedial excavation areas and areas believed to have residual contamination are depicted on Figure 4.17-1, along with the location of USTs.

Site-specific risk assessment and leachability testing indicated a low risk to groundwater from petroleum hydrocarbons and therefore no additional remedial actions were performed for petroleum hydrocarbons (USACE 2019), other than institutional controls (land restrictions) which are currently in place to address remaining petroleum hydrocarbons present on site, which include (USACE et al. 2012; USACE 2019):

- The property on which the Fire Training Area was located shall not be used in the future as a residential property or a day care facility.
- Future storm water runoff systems shall be designed to divert runoff away from the UST areas.
- In the event of future subsurface excavations in the control area:
    - Contractors and employees working in subsurface excavations shall be notified of the need to utilize health and safety precautions normally applicable to UST removals;
    - Excavations shall be observed by a qualified environmental professional to determine if exposed soils contain free product. If free product is encountered, excavated soils shall be disposed of in an appropriate off-site landfill. If free product is not encountered, the soils may be returned to the original excavation, or very close to the original excavation in a substantially similar environment;
    - Temporary storm water controls and other BMPs, such as temporary soil covers and subsurface liners, shall be used to minimize infiltration and runoff of soil materials.

The restrictive covenant for the site also requires that the USACE and NOAA Real Property Management Division (RPMD) shall be notified in writing prior to any construction, demolition, or excavation activities to take place within the Former Fire Training Area (USACE et al 2012).

Per- and polyfluoroalkyl substances (PFAS) are a class of chemicals that are extremely persistent in the environment, and there is evidence that continued exposure above specific levels to certain PFAS may lead to adverse health effects (EPA 2022b). Due to the use of aqueous film forming foam during fire training activities, which may have contained PFAS, a work plan was prepared by USACE to assess PFAS in soil and groundwater in the vicinity of former fire training infrastructure (USACE 2021a). Soil and groundwater sampling in accordance with the workplan was undertaken in June 2021, and reported in October 2022 (USACE 2022a; 2022b). Subsurface soil and groundwater samples were collected from 15 boring locations—6 within the main parking lot near the former main simulator complex (southeast portion of the MRS), 6 in the vicinity of other former fire training infrastructure (central eastern portion of the MRS), and 3 near the northern simulator foundation (northeast portion of the MRS). Results from the USACE investigation (as reported in the Addendum to the Final Site Investigation Report, which updated the original report to reflect the latest screening levels released by the Office of the Assistant Secretary of Defense (ASD) in July 2022) are shown on Figure 4.17-2 and summarized on the following page.



50 0 50 100

SCALE IN FEET

LEGEND

- UST - POTENTIALLY INTACT
- UST - CLOSED OR REMOVED
- PROPERTY BOUNDARY
- PROPOSED ACTION COMPONENTS
- FORMER FIRE TRAINING AREA
- S10 PFAS SAMPLING LOCATIONS (USACE 2022)
- SIMULATOR FOUNDATION

PFAS SOIL SAMPLING

- EXCEEDS ONE OR MORE SCREENING LEVELS
- NOT DETECTED ABOVE SCREENING LEVELS
- NOT DETECTED

PFAS GROUNDWATER SAMPLING

- EXCEEDS ONE OR MORE SCREENING LEVELS
- NOT DETECTED ABOVE SCREENING LEVELS
- NOT DETECTED

EXISTING BUILDINGS KEY

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DRAWING SOURCE: HDR.
IMAGERY SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY.
SCREENING LEVEL SOURCE: OFFICE OF THE ASSISTANT SECRETARY OF DEFENSE, JULY 2022, "INVESTIGATING PER- AND POLYFLOUROALKYL SUBSTANCES WITHIN THE DEPARTMENT OF DEFENSE CLEANUP PROGRAM."
SAMPLING RESULTS SOURCE: US ARMY CORPS OF ENGINEERS, OCTOBER 2022. "ADDENDUM TO THE FINAL SITE INSPECTION REPORT, MANCHESTER ANNEX PER- AND POLYFLUOROALKYL SUBSTANCES."

AECOM

PER- AND POLYFLUOROALKYL SUBSTANCES (PFAS) PRELIMINARY SAMPLING RESULTS

FEBRUARY 2023
60680959

NOAA NWFSC MANCHESTER RESEARCH STATION
SEAWATER SYSTEM REPLACEMENT AND CAMPUS ADDITION PROJECT
MANCHESTER, WASHINGTON

FIGURE 4.17-2

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The USACE investigation detected PFAS compounds in both subsurface soil and groundwater in some areas of the MRS. None of the subsurface soil samples contained PFAS compounds at levels which exceeded the most recent residential or composite site worker screening levels established by the Office of the ASD in July 2022. Groundwater samples at 11 of the 15 sampling locations contained at least one PFAS compound that exceeded the applicable ASD screening level for tapwater, and two sampling locations contained at least one PFAS compound that exceeded the applicable Drinking Water Health Advisory screening levels.

- Summary of PFAS Detections in Soil:
    - Perfluorooctane sulfonate (PFOS) was detected in subsurface soil at two sampling locations (S1 and S3) within the main parking lot area at levels between 0.386 and 2.19 nanograms per gram (ng/g), which are below the residential (13 micrograms per kilogram [µg/kg]) and composite worker (160 µg/kg) screening levels for PFOS[10].
    - Perfluorooctanoic acid (PFOA) was detected in subsurface soil at one sampling location (S12) just south of Building 27 at a level of 0.229 ng/g, which is below the residential (19 µg/kg) and composite worker (250 µg/kg) screening levels.
    - Perfluorobutane sulfonate (PFBS), perfluorononanoic acid (PFNA) and perfluorohexansulfonic acid (PFHxS) were not detected in subsurface soil at any sampling locations at levels above the laboratory reporting threshold.
- Summary of PFAS Detections in Groundwater:
    - PFOS was detected in groundwater at 13 of the 15 sampling locations, at levels between 0.801 nanograms per liter (ng/L) and 128 ng/L. Five of the sampling locations (S1, S2, S3, S4, and S5) in the main parking lot area, and one sampling location (S8) in the central area exceeded the ASD screening level for tapwater of 4 ng/L. One of these locations (S3) also exceeded the Drinking Water Health Advisory screening level of 70 ng/L.
    - PFOA was detected in groundwater at all 15 sampling locations (S1 through S15), at levels between 3.43 ng/L and 45.1 ng/L. Five of the sampling locations in the main parking lot (S1, S2, S3, S4 and S5) and four sampling locations in the central area (S9, S10, S11 and S12) and two sampling locations in the north (S13 and S14) exceeded the ASD screening level for tapwater. None of the groundwater samples exceeded the Drinking Water Health Advisory screening level for PFOA of 70 ng/L).
    - Two sample locations (S1 and S3) in the main parking lot area had a combined PFOS + PFOA concentration[11] of 105.6 ng/L and 139 ng/L, respectively, which exceed the applicable screening level of 70 ng/L.
    - PFBS was detected in groundwater at 13 of the 15 sampling locations, at levels between 0.733 ng/L and 16.3 ng/L. None of the sampling locations exceeded the ASD screening

[10] 1 nanogram per gram (ng/g) is equal to 1 microgram per kilogram (µg/kg)
[11] EPA recommends comparing the combined analytical results for PFOA and PFOS when both are present.

level of 601 ng/L (no Drinking Water Health Advisory screening level has been established for PFBS).

- PFNA was detected in groundwater at 11 of the 15 sampling locations (S1 through S4 in the main parking lot; S9 through S12 in the central area; and S13 in the northern area) at concentrations up to 10.4 ng/L. Only one location (S1) exceeded the ASD screening level of 6 ng/L (no Drinking Water Health Advisory screening level has been established for PFNA).
- PFHxS was detected in groundwater at 10 of the 15 sampling locations (S1 through S6 in the main parking lot; S9, S10 and S12 in the central area; and S13 in the northern area) at concentrations up to 17.2 ng/L. None of the locations exceeded the ASD screening level of 36 ng/L (no Drinking Water Health Advisory screening level has been established for PFHxS).

The vertical and horizontal extent of PFAS contamination at the site has not been well-delineated due to the limited sampling program, and USACE staff have indicated that additional sampling will be undertaken in the future (USACE 2023).

Other areas associated with the Manchester Superfund Site include the former landfill area, which is present on approximately 6 acres of the adjacent EPA and State Park properties directly northwest of the NOAA property. Landfill activities contaminated soils and sediments with dioxins and furans, PCBs, metals, vinyl chloride, and asbestos. Remedial actions undertaken at the former landfill area have included a landfill cap; a shoreline protection system; a thin-layer sediment cap in the intertidal area of Clam Bay; and a restriction on subsistence-level shellfish harvesting was put into place until it can be determined that the shellfish are safe for consumption. Upland sources from the landfill area also resulted in PCB contamination of intertidal sediments and shellfish in portions of Clam Bay (USACE 2021b). Part of the remedy selected for the site included enhancing natural recovery (ENR), with the placement of a shallow sand layer over the sediment surface, and implementation of a temporary subsistence-level shellfish harvesting restriction in the intertidal area of Clam Bay. The predominant PCB contaminant detected at the site is Aroclor 1260 (USACE 2021b).

PCB concentrations in tidal sediments within Clam Bay have been monitored for several years following implementation of the remedial actions required by the Record of Decision (ROD). The average sitewide concentration of PCBs at long-term monitoring locations for tidal sediments decreased from 1995 through 2009, increased from 2013 through 2016, and then decreased again from 2016 to 2020 (USACE 2021b). The most recent 2020 sampling results indicated an average concentration of 27 µg/kg (with 95 percent upper confidence level concentration of 35 µg/kg), which is below the sediment cleanup level of 130 µg/kg and 40 µg/kg total PCBs that were stated in the ROD (Hart Crowser 1997). The overall increase in PCB concentrations between 2013 and 2016 was mostly associated with increased PCB concentrations in the intertidal area closest to the shoreline of the NOAA property—other areas further offshore and adjacent to the former landfill/EPA shoreline generally showed a stable or decreasing trend over the same period. The processes responsible for the changes in sediment concentrations are not fully understood; however, erosion of the coastal embankment along the NOAA shoreline and near the existing NOAA outfalls was identified as a potential source for the increased PCB concentrations in tidal sediments in that

area (USACE 2019). More detailed sampling of tidal sediments in areas adjacent to the NOAA property and soil sampling from the coastal embankment near the existing outfalls was undertaken by USACE in 2020 (see Figure 4.17-3). This sampling identified several areas of the embankment with elevated PCB concentrations, which generally corresponded to the areas of tidal sediments with elevated PCB concentrations. The sample taken from the embankment adjacent to the outfall that is proposed to be retained as part of the proposed action had the lowest total PCB concentration of all ten embankment samples (12 µg/kg); soil samples taken at or near the other outfalls (which would be abandoned in place as part of the proposed action) had higher PCB concentrations, up to 3,400 µg/kg (USACE 2022b).

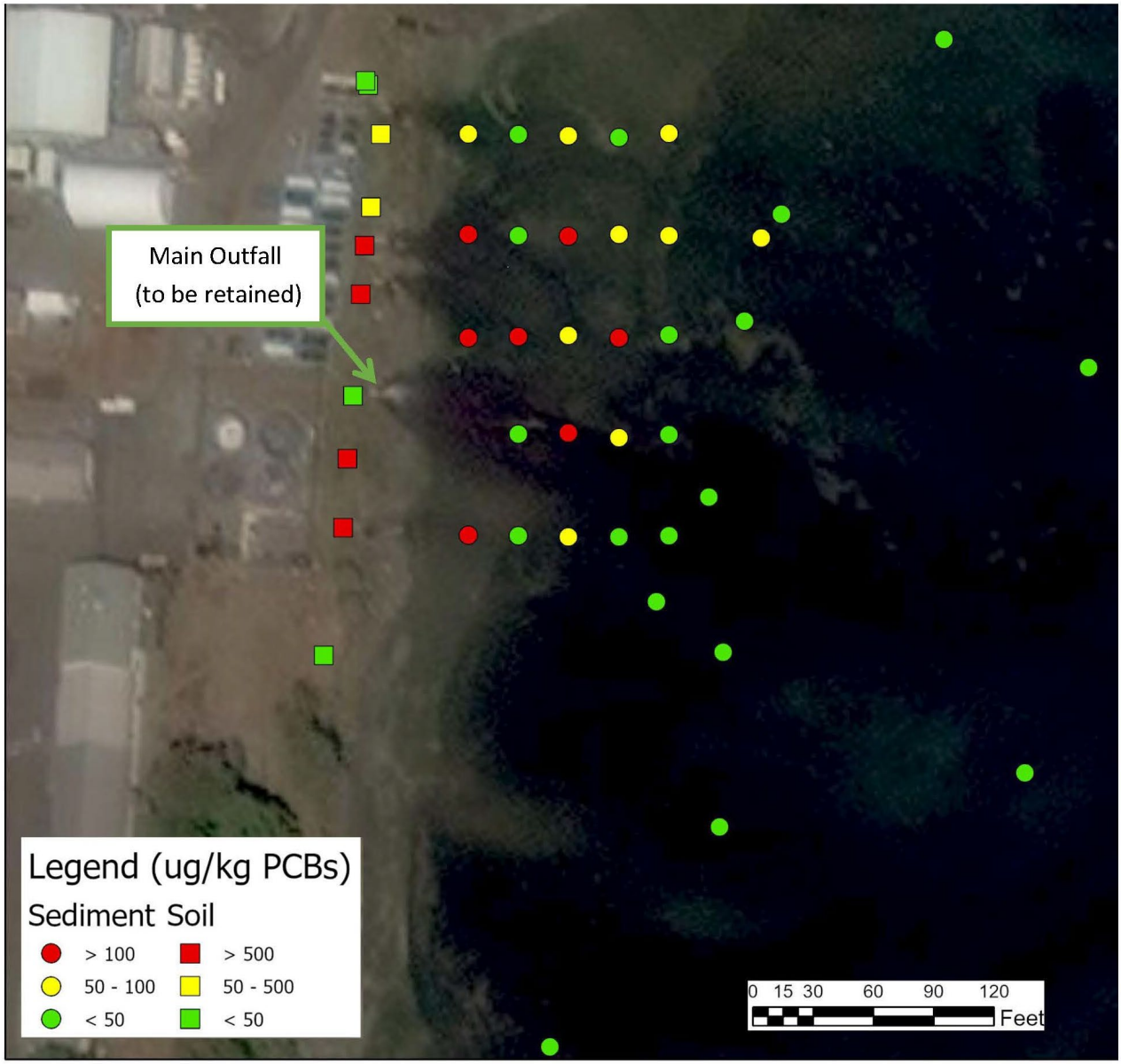

Figure 4.17-3 Distribution of Elevated Total PCBs in Soils and Sediments Near the NOAA Outfalls and Low Bank Areas

Source: Adapted from U.S. Army Corps of Engineers, 2021b. Final 2020 Data Analysis Report for Clam Tissue and Sediment Sampling (Figure 26).

Concentrations of PCBs in clam tissue have also been monitored over the same period. Average PCB concentrations in clam tissue from long-term monitoring locations decreased from 1995 through 2013 and have remained relatively stable since that time. The most recent tissue sampling event in 2020 showed an average of 26.5 µg/kg total PCBs (USACE 2021b), which is below the cleanup goal of 42 µg/kg that was specified in the ROD (Hart Crowser 1997). USACE staff have indicated that additional PCB sampling will be undertaken in the first part of 2023 (USACE 2023).

Of the nine samples from upland areas that were analyzed for PCBs during previous investigations, only two contained concentrations of PCBs above detection limits and only one of which exceeded the applicable human health screening level (Hart Crowser 1996). That sample location, with a concentration of 580 µg/kg, was in the northern portion of the former Fire Training Area.

CHEMICALS AND HAZARDOUS WASTE

The MRS stores and uses a small quantity of various hazardous chemicals for research and laboratory purposes, as well as typical hazardous products associated with landscaping, maintenance, and cleaning activities. No acutely hazardous materials are used or stored on site. Such materials are handled in accordance with relevant regulations and manufacturer recommendations and are stored in a chemical storage container (Building 10).

The facility is a Very Small Quantity Generator[12] of hazardous waste. Hazardous waste typically generated at the site under existing operations includes small quantities of laboratory wastes and spent chemical solutions (e.g., mercury debris, mercury chloride, isopropyl alcohol, acetone, sodium arsenite, formalin, spent ethanol DNA extraction, spent paracide, and spent preservatives). Between 2019 and 2022, the facility generated a total of 60 pounds of hazardous waste.

HAZARDOUS BUILDING MATERIALS

Existing MRS structures including the main building (Building 1, 2, 3), and Buildings 4, 5 and 6 were constructed in the 1940s when regulated hazardous building materials such as lead based paint, asbestos-containing material, and PCB-containing materials may have been used during construction and/or additions. Other buildings and aboveground structures were installed in the 1980s or later, which post-date the prohibition of such substances in construction.

Approximately 100 linear feet of subsurface, asbestos-clad piping were encountered and abated during the remedial action conducted in March 2000 through February 2001 (Hart Crowser 2005). Although the goal of the remedial action at the site was to remove all UST system piping, the report stated that pipe sections that were impractical to remove would be purged and abandoned in-place.

[12] Very Small Quantity Generators are those that generate less than 220 pounds of hazardous waste and less than 2.2 pounds of acute hazardous waste per month and must transport generated hazardous waste to an appropriately permitted off-site treatment or disposal facility (EPA 2020).

4.17.3 Environmental Consequences

PREFERRED ALTERNATIVE

Construction

Disturbance of Contaminated Soils

The likelihood of soil contamination in areas of the MRS outside of the Former Fire Training Area (e.g., near the proposed Filter/UV System and Aeration Head Tank) is low, as these areas are outside of and upgradient of the known contamination areas. Construction of the Preferred Alternative would involve pipeline installation and construction of Building A within the Former Fire Training Area. While the Preferred Alternative has generally been designed to avoid areas of known petroleum contamination, a small area of known contamination is present within the conceptual footprint for Building A (see Figure 4.17-1). It is also possible that additional unknown areas of total petroleum hydrocarbon or dioxin contamination could be present, which could be encountered during trenching or other ground-disturbing activities within the Former Fire Training Area.

If petroleum- or dioxin-contaminated soils are encountered during ground-disturbing activities, this could expose construction workers and possibly the general public to levels of contaminants that could cause health impacts, if contaminated materials are not appropriately handled, stored, and disposed of, and could potentially remobilize contaminants to stormwater or surface water. It is also possible (but unlikely) that excess spoils generated during trenching and excavations could exceed federal or State thresholds for hazardous/dangerous waste, and therefore may require special handling and disposal to avoid or minimize impacts on the environment, the public, and construction workers.

As described above in Section 4.17.2, preliminary investigation by USACE has also determined that PFAS compounds are present in subsurface soils within the main parking lot area and to the south of Building 27 (see Figure 4.17-2). The main trunkline route has been designed to run along the northern boundary of the main parking lot and is not anticipated to encounter the PFAS-contaminated soils that are present further south near the main simulator foundation (sampling locations S1 and S3). However, installation of the trunkline branch serving Building 27 could encounter PFAS-contaminated soils in the vicinity of sampling location S12. The level of PFAS detected in soils in this area is well below the applicable human-health based screening levels and federal or State thresholds for hazardous/dangerous waste and therefore does not represent a health risk to construction workers or require transport and disposal as a hazardous/dangerous waste. However, any excess spoils generated from this area would need to be handled and disposed of appropriately to avoid remobilization of contaminants and/or introduction of PFAS contamination to new areas of the site.

Construction activities would not disturb the tidal sediments or coastal embankment where levels of PCBs up to 3,400 µg/kg have been recently detected, as all but one of the existing seawater outfalls would be abandoned in place, and the one outfall to be retained would not require any modifications at the coastal embankment or within the tidal area (tie-in of the proposed overflow pipelines to the outfall would occur further upland). Historic sampling for PCBs within the upland areas of the site detected concentrations did

not detect PCBs in the majority of the former Fire Training Area at concentrations above applicable screening levels, with the exception of one sample in the northern portion of the site near proposed Building A (Hart Crowser 1996). Construction of Building A could potentially encounter elevated levels of PCBs in soils, which could potentially cause health impacts, if adequate health and safety precautions are not taken to reduce potential exposure. In addition, excess spoils generated from this area would need to be handled and disposed of appropriately to avoid remobilization of contaminants and/or introduction of PCB contamination to new areas of the site.

With implementation of the BMPs and mitigation measures described in Section 4.17.4 below, soils excavated during construction would not be moved to different areas of the site, and any excess spoils generated would be adequately characterized and disposed of at an appropriate off-site facility. Therefore, with implementation of these mitigation measures and BMPs, construction of the Preferred Alternative would have a *short term, moderate impact* from the disturbance of contaminated soil.

Disturbance of Contaminated Groundwater

Groundwater may also be encountered during construction activities, which would require dewatering. Based on previous leachability testing for total petroleum hydrocarbons (USACE 2019) and the low solubility of dioxins (Rodriguez et al 2008), these contaminants are unlikely to have impacted groundwater at the site.

PFAS were detected in almost all groundwater samples, in some cases exceeding the applicable July 2022 ASD screening levels for tap water and in two locations in the main parking lot exceeding the Drinking Water Health Advisory screening levels (see Figure 4.17-2). In most of the sampling locations, groundwater was encountered in the borings at depths of between 2 to 9 feet below ground surface. Installation of the trunk lines and overflow pipes within the Former Fire Training Area would require trenching up to approximately 2 to 3 feet below ground surface and may encounter groundwater, requiring dewatering of the excavations. Construction of Building A within the northern part of the Former Fire Training Area could also potentially encounter groundwater. If dewatering water is not appropriately handled or discharged, then contaminants such as PFAS could be remobilized and could potentially impact stormwater quality or discharge into Clam Bay.

With implementation of the BMPs and mitigation measures described in Section 4.17.4 below, any dewatering would be handled, characterized, and disposed of appropriately to avoid release of contaminated water to the environment or remobilization of contaminants. With implementation of these BMPs and mitigation measures, construction of the Preferred Alternative would have a *short term, moderate impact* from the disturbance of contaminated groundwater.

Disturbance of Hazardous Building Materials

The Preferred Alternative would not include demolition or renovation of any above-ground structures that are of an age where hazardous building materials such as lead-based paint or asbestos are of concern. As previously mentioned, subsurface asbestos-clad piping associated with former USTs at the site was abated and removed from the site during previous remedial actions, however some pipe sections may have been

purged and abandoned in-place. Therefore, it is possible that additional underground asbestos-clad piping could still be present in the Former Fire Training Area of the site.

Trenching to install the seawater system pipelines during Phase 1 construction, and excavation for buildings during Phase 2 construction (particularly Building A) could encounter remnant asbestos-clad piping associated with former USTs. In particular, the proposed trunkline serving Building 21 would require trenching close to the location of former USTs 10 and 16 (see Figure 4.17-1), and proposed Building A would require removal of the remnant simulator foundation, which could potentially have piping or other buried remnant features nearby.

Inhalation of asbestos fibers is associated with various health conditions including asbestosis, lung cancer, and mesothelioma (ATSDR 2022). With implementation of the BMPs and mitigation measures described in Section 4.17.4, a contingency plan would be prepared to identify procedures to be followed should remnant asbestos-clad piping be encountered during construction. With implementation of the BMPs and mitigation measures, the risk of worker or public exposure to asbestos fibers would be reduced and the impact would be *short-term and minor.*

Use of Hazardous Materials during Construction

Construction of the Preferred Alternative would involve the use of typical construction-related materials, such as fuel, oil, lubricants, and adhesives. Improper handling or storage or accidental spills of such hazardous materials could potentially result in adverse impacts on the environment or construction personnel.

NOAA employees and construction contractors would be required to comply with all relevant federal, State, and local statutes and regulation including Dangerous Waste regulations (WAC 173-303) related to the transport, use, storage, or disposal of hazardous materials/waste and including OSHA and Washington State Department of Labor and Industries regulations to protect workers through hazard communication and provision of adequate training. Any unused construction-related hazardous materials would be removed from the NOAA property after completion of construction and disposed pursuant to applicable federal, State, and local regulations.

In addition, it is assumed that construction contractor environmental requirements will include typical best management practices associated with the handling of hazardous materials (see Section 4.17.4, below). Implementation of these standard procedures, and adherence to applicable federal, State, and local regulations would minimize the potential release of hazardous materials from accidental spills or improper handling. The impact would be *short-term and minor*.

Operation

Disturbance of Existing Contamination or Hazardous Building Materials

Operation of the Preferred Alternative would not require ongoing ground disturbance and existing institutional controls in the Former Fire Training Area would be maintained. There would be no potential

to disturb existing contaminated soils or groundwater at the site, and no potential to encounter remnant underground objects such as asbestos-clad piping.

The proposed change from several existing seawater outfall discharge points to one combined seawater outfall discharge point would result in a slightly higher discharge flow rate (from 2,200 gpm to 2,500 gpm) and velocity (from approximately 4.9 feet per second to 5.6 feet per second) from that outfall compared to existing conditions. As discussed previously, this minor (approximately 14 percent) increase in flow rate and velocity is not anticipated to substantially increase erosion of tidal sediments in the vicinity of the outfall, because the existing main outfall discharges onto an area of rip-rap/stony substrate (see Figure 4.17-2), and therefore the minor increase in discharge velocity would not cause a substantial increase in the scour of fine sediments at the outfall. Furthermore, any potential minor increase in scour of fine sediments due to channelization of the discharge within the intertidal sediments at low tide would be offset by a decrease in channelization and scour at the other existing outfalls to be abandoned. The outfalls to be abandoned are located at a higher elevation above the ground surface and some discharge onto areas of finer sediments. Therefore, consolidation of the site discharge into the main outfall is expected to result in a negligible change to erosion rates and associated turbidity or water quality issues within the intertidal area compared to existing conditions.

As shown in Figure 4.17-3, the area of the embankment directly adjacent to the retained outfall has substantially lower PCB concentrations than other areas of the embankment further north or south, where the other existing outfalls would be abandoned in place. Therefore, even if the minor increase in discharge velocity at this outfall were to lead to slightly increased erosion of the coastal embankment, the erosion would occur in an areas with lower PCB concentrations.

Therefore, long-term impacts relating to the existing contamination or disturbance of hazardous building materials would be *negligible to minor*.

Use of Hazardous Materials during Operation

Once operational, use of hazardous chemicals would continue in a similar manner to the existing conditions. While the quantity of chemicals at the site might increase slightly, and the types of chemicals used for new research activities might change, the use of acutely hazardous chemicals is not anticipated and no substantial increase in hazardous waste generation would occur. The existing chemical handling, storage, and disposal procedures and applicable regulations would be followed, and the risk of accidental spill or exposure would not substantially increase compared to existing conditions. The impact would be *long-term and negligible*.

NO-ACTION ALTERNATIVE

The No-Action Alternative would involve no construction activities and no increase in the intensity of site use. Because no construction activities or ground disturbance would occur, there would be no potential for accidental spills of construction-related hazardous materials and no disturbance of remnant piping or site soils that could expose construction workers or the public to hazardous materials.

Operational use of hazardous materials under the No-Action Alternative would be identical to existing operations in the near future and would cease in the medium- to long-term. Therefore, no impacts related to hazardous materials would occur under the No-Action Alternative.

ACTION ALTERNATIVE 1

Disturbance of Contaminated Soils

Construction of Action Alternative 1 would have the same impacts as described for Phase 1 of the Preferred Alternative, relating to installation of pipelines within the Former Fire Training Area, but would avoid the additional impacts associated with construction of Building A. With implementation of the BMPs and mitigation measures described in Section 4.17.4 below, impacts associated with potential disturbance of contaminated soils would be *short-term and moderate.*

Operation of Action Alternative 1 would not require ongoing ground disturbance, and existing signage relating to the institutional controls in the Former Fire Training Area would be maintained. Changes to the existing outfall would be identical to that described for the Preferred Alternative. Therefore, long-term impacts from this alternative relating to the existing contamination would be *negligible to minor*.

Disturbance of Hazardous Building Materials

Construction of Action Alternative 1 would also have potential to encounter remnant subsurface asbestos-clad piping within the Former Fire Training Area; however, the potential would be slightly reduced compared to the Preferred Alternative due to the smaller construction footprint. With implementation of the BMPs and mitigation measures described in Section 4.17.4, the risk of worker or public exposure to asbestos fibers would be reduced and the impact would be *short-term and minor*.

Use of Hazardous Materials during Construction

Construction of Action Alternative 1 would involve the use of similar typical construction-related materials, such as fuel, oil, lubricants, and adhesives as described for the Preferred Alternative. However, the potential for environmental impacts from improper handling or storage or accidental spills would be less than that described for the Preferred Alternative due to the shorter duration of construction. As described for the Preferred Alternative, with implementation of the standard procedures described in Section 4.17.4, and adherence to applicable federal, State, and local regulations the impact would be *short-term and minor*.

Use of Hazardous Materials during Operation

Under Action Alternative 1, there would be no substantial change in the use of hazardous chemicals at the site as no additional research and laboratory buildings would be constructed, and operation of the new seawater treatment and distribution system would be almost identical to existing conditions. The existing chemical handling, storage, and disposal procedures would be followed, and the risk of accidental spill or exposure would be the same as existing conditions. There would be *no impact*.

4.17.4 Mitigation Measures

PREFERRED ALTERNATIVE

BMPs relating to stormwater runoff and stormwater control, which include spill prevention and response measures, as described in Section 4.5.4, would be implemented as part of the Preferred Alternative. The construction contractor would prepare and implement a Construction SWPPP and other erosion control measures as detailed in Section 4.5, *Water Resources and Hydrological Processes*.

The following mitigation measures are recommended as part of implementation of the Preferred Alternative:

- **Mitigation Measure 4.17-1: Environmental Media Management Plan.** Prepare an Environmental Media Management Plan to assist NOAA and construction personnel in managing contaminated soils, dewatering water, or remnant site features that may be encountered during construction earthwork activities to minimize impacts on the environment and on worker and public health and safety. The Environmental Media Management Plan shall include procedures to be employed during ground disturbing activities within the Former Fire Training Area (see Figure 4.17-1) to minimize risks associated with handling or disposal of potentially contaminated soils or groundwater, or asbestos-clad piping. NOAA shall consult and coordinate with the EPA Region 10 Remedial Project Manager and with the US Army Corps of Engineers Project Manager in developing the Environmental Media Management Plan. The Environmental Media Management Plan shall include, at a minimum, the following components:

    - **Soil Management Plan:** procedures for excavation, stockpiling, loading, and disposal of potentially contaminated soils excavated during construction, including decontamination procedures and management of residual materials, in accordance with Ecology MTCA and Dangerous Waste regulations, and federal hazardous waste regulations, and the EPA's *Interim Guidance on the Destruction and Disposal of Perfluoroalkyl and Polyfluoroalkyl Substances and Materials Containing Perfluoroalkyl and Polyfluoroalkyl Substances*. In particular, the plan shall include procedures to prevent the reuse of potentially contaminated soils at different areas of the project site and to require any excess spoils to be removed, characterized, and disposed of at an appropriate facility, and to ensure that the institutional controls (see Mitigation Measure 4.17-2 below) are maintained.
    - **Sampling and Analysis Plan:** procedures for waste characterization sampling and analysis for excess spoils removed from the site.
    - **Contingency Asbestos Handling Plan:** procedures for avoidance and/or safe handling, removal and disposal of remnant subsurface asbestos-clad piping, if encountered during construction.
    - **Contingency Dewatering Plan:** procedures for handling, storage, and disposal of contaminated and uncontaminated groundwater generated during construction dewatering

(if required) in accordance with MTCA regulations and Kitsap County Public Works Division requirements.

- **Mitigation Measure 4.17-2: Implement Institutional Controls.** NOAA and its contractors shall implement and adhere to the following site institutional controls (USACE et al 2012; USACE 2019):

    - USACE and NOAA Real Property Management Division shall be notified in writing prior to any construction, demolition, or excavation activities to take place within the Former Fire Training Area.
    - Design future storm water runoff systems to divert runoff away from the UST areas.
    - Notify contractors and employees working in subsurface excavations of the need to utilize health and safety precautions normally applicable to UST removals.
    - Excavations shall be observed by a qualified environmental professional to determine if exposed soils contain free product. If free product is encountered, excavated soils shall be disposed of in an appropriate off-site landfill. If free product is not encountered, the soils may be returned to the original excavation, or very close to the original excavation in a substantially similar environment.
    - Temporary storm water controls and other BMPs, such as temporary soil covers and subsurface liners, shall be used to minimize infiltration and runoff of soil materials.

- **Mitigation Measure 4.17-3: Site-specific Health and Safety Plan:** The contractor shall develop a site-specific health and safety plan outlining procedures to protect worker health and safety during all site development and construction activities, in accordance with 29 CFR 1910.120. Site-specific investigation reports relating to petroleum, dioxin, and PFAS contamination at the site should be provided to the contractor by NOAA, to inform the development of appropriate health and safety measures.

NO-ACTION ALTERNATIVE

No mitigation measures are required for the No-Action Alternative in relation to hazards and hazardous materials.

ACTION ALTERNATIVE 1

The BMPs and mitigation measures for the Action Alternative 1 are the same as for the Preferred Alternative.

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4.18 PUBLIC SERVICES

This section describes existing public services in the project area and analyzes the impacts of the Proposed Action relating to such services. Factors to be considered include direct changes to physical facilities or the operations of public service providers, and potential changes in the demand for or quality of the public services.

4.18.1 Regulatory Setting

There are no directly applicable federal, State, or local regulations pertaining to the effects of federal actions on local public services. Public services are generally provided at a county-wide level in Kitsap County and are not provided through any federal mandates.

4.18.2 Affected Environment

The Washington State Patrol provides police and patrol services on the Washington state highways, while the Kitsap County Sheriff's Office provides police and patrol services to the Manchester community. The six divisions of the Sheriff's Office include detectives, patrol, and support services, as well as administration, corrections, and the office of professional standards (Kitsap County, 2018). The South Kitsap Fire and Rescue Station 9 is located on the south side of Manchester, near SE Mile Hill Drive, approximately 2.5 miles south of the research station. South Kitsap Fire and Rescue provides fire suppression, rescue, and emergency medical services to the community of Manchester. The Emergency Services Section of the South Kitsap Fire and Rescue includes the coordination of career firefighters, a volunteer firefighter program, and fire prevention services (South Kitsap Fire and Rescue, 2021).

Manchester is part of South Kitsap School District, which serves approximately 10,000 students (U.S. News & World Report, 2018). Manchester Elementary is the nearest school to MRS, located approximately 1.3 miles south of the research station.

4.18.3 Environmental Consequences

PREFERRED ALTERNATIVE

Construction

Existing public services would be provided during construction activities, including medical, emergency, and security-related services. Construction events are not expected to be a burden on the existing service capacity, as worker safety and site security measures would be taken by the construction contractor in accordance with relevant federal and state occupational health and safety regulations. Typical construction safety operations would be implemented to reduce the potential for emergency situations, such as work zone delineation, signs to communicate hazardous areas to site users, implementing proper safe works plans and construction safety protocols. As discussed in Section 4.14, *Transportation*, the Preferred Alternative would not require any construction activities within public rights of way that could cause a hindrance to emergency response vehicles on Beach Drive East, and, with implementation of

BMPs described in that section, emergency access through the NOAA property to the adjacent EPA research facility would be maintained throughout construction. Impacts to public services during construction would be *short term and negligible*.

Operation

Operation of the research station with the proposed seawater treatment and distribution system and four new buildings would be similar to existing operations and is therefore not anticipated to generate substantial additional long-term demand for public services. The Preferred Alternative would not create a substantial increase in population. A maximum of six additional permanent employees and 10 temporary visitors would result from implementation of the Preferred Alternative, which is not anticipated to exceed the existing capacity of public service providers. Therefore, operational impacts to public services would be long-term and *negligible*.

NO-ACTION ALTERNATIVE

The No-Action Alternative would involve no construction activities and no increase in staff numbers or intensity of site use. Because there would be no increase in site personnel, the demand for public services, such as medical, emergency, and security services, would be unchanged. Therefore, there would be *no impacts* to public services under the No-Action Alternative.

ACTION ALTERNATIVE 1

Construction

As with the Preferred Alternative, existing public services would be provided during construction activities. Construction time would be shorter than under the Preferred Alternative (i.e., 12 months instead of 24 months), as only the proposed replacement seawater treatment and distribution system would be installed at the site. Therefore, construction events would have less potential to burden existing public services. The construction contractor would implement the same construction safety and site security protocols as outlined under the Preferred Alternative. Impacts to public services from construction of Action Alternative 1 would be *short-term and negligible*.

Operation

As with the Preferred Alternative, operation of the research station with the proposed installation of the new seawater system would be similar to existing operations and is therefore not anticipated to generate additional long-term demand for public services. Action Alternative 1 would not change the number of employees or visitors to MRS relative to existing conditions. Therefore, operation of Action Alternative 1 would have *no long-term impacts* to public services.

4.18.4 Mitigation Measures

No mitigation measures are required for the Preferred Alternative, No-Action Alternative, or Action Alternative 1 in relation to public services.

4.19 ENVIRONMENTAL JUSTICE

4.19.1 Regulatory Setting

FEDERAL

Executive Order 12898

EO 12898, known as the Federal Environmental Justice Policy, requires all federal agencies to identify and develop strategies to address disproportionately high and adverse human health and environmental impacts of its programs, policies, and activities on minority and low-income populations (collectively known as environmental justice populations) in the United States and its territories to the greatest extent practicable and permitted by law. Federal agencies are required to make all documents, notices, and hearings related to human health and the environment accessible to the public. The EO is intended to promote nondiscrimination in federal programs, as well as provide minorities and low-income populations with access to information and public participation.

Two documents provide some measure of guidance to agencies required to implement this executive order: *Environmental Justice: Guidance under the National Environmental Policy Act* (Council of Environmental Quality [CEQ] 1997) and *Promising Practices for EJ Methodologies in NEPA Reviews* (EPA 2016). Both serve as guides for incorporating environmental justice goals into preparation of environmental impact statements under NEPA. These documents provide specific guidelines for determining whether there would be any environmental justice issues associated with a proposed federal action.

Council on Environmental Quality

The CEQ Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500–1508) provide guidance related to social and economic impact assessments by noting that the "human environment" assessed under NEPA is to be "interpreted comprehensively" to include "the natural and physical environment and the relationship of people with that environment" (40 CFR 1508.14).

According to the CEQ's environmental justice guidelines, minority and low-income populations should be identified where either: a) the minority or low-income population of the affected area exceeds 50 percent; or b) the minority or low-income population percentage of the affected area is meaningfully greater than the minority or low-income population percentage in the general population or other appropriate unit of geographic analysis (CEQ 1997).

STATE AND LOCAL

There are no State or local regulations pertaining to environmental justice that are applicable to the Proposed Action.

4.19.2 Affected Resources

The main community in the project area is the Manchester Census Designated Place (CDP). In 2021 the estimated population of Manchester CDP was 5,928 (USCB 2021a). In general, the racial profiles for Manchester CDP were similar across the census areas such as the City of Port Orchard, East Port Orchard, and Parkwood CDPs. According to the EPA's EJ screening tool, the minority population in Manchester is 22 percent, which is lower than both the state and U.S. totals of 33 percent (39th percentile) and 40 percent (41st percentile), respectively (EPA 2023). As shown in Table 4-7, Manchester CDP has a higher median household income ($91,750) than Kitsap County ($84,600) and Washington ($82,400), however, the poverty rate (15.5 percent) is higher than the county (8.0 percent) and state (10.0 percent) (USCB 2021b; USCB 2021c). Overall, the low-income population in Manchester CDP is 28 percent, which is slightly higher than the state average of 24 percent (64th percentile) and 2 points lower than the U.S. average of 30 percent (50th percentile) (EPA 2023). Therefore, based on the definitions under the CEQ and EPA's environmental justice guidance (CEQ 1997; EPA 2016), Manchester CDP is not considered a minority or low-income community because the minority and low-income populations are not greater than 50 percent of the total population or meaningfully greater than the state.

Table 4-7 Demographic and Socioeconomic Characteristics, 2021

Characteristic	Manchester CDP	Kitsap County	State of Washington
Total Population	5,928	273,072	7,617,364
Race/Ethnicity	-	-	-
White	4,958	215,001	5,465,011
Black or African American	56	7,591	293,401
American Indian and Alaska Native	0	2,974	90,789
Asian	310	13,565	682,711
Native Hawaiian and other Pacific Islander	111	2,613	50,902
Hispanic or Latino	586	22,582	1,007,881
Poverty	15.5%	8.0%	10.0%
Median Household Income	$91,750	$84,600	$82,400
Unemployment Rate*	1.3%	4.6%	5.1%

Notes:
*Civilian labor force
CDP = Census Designated Place; "-" indicates blank cell.
Source: USCB 2021

4.19.3 Environmental Consequences

PREFERRED ALTERNATIVE

The minority and low-income populations in Manchester CDP are not greater than 50 percent of the total population or meaningfully great than the state, therefore, Manchester CDP is not considered a minority or low-income community. Furthermore, under the Preferred Alternative, there would be no changes to

the overall land use at MRS and no new types of land use activities that might potentially impact surrounding populations would be introduced. Large trucks entering and leaving MRS during construction of the replacement seawater system or new buildings would follow local haul routes and measures identified in the TCP. Therefore, there would be no disproportionate or high adverse effects on low-income or minority populations from implementation of Action Alternative 1.

ACTION ALTERNATIVE 1

Manchester CDP is not considered a minority or low-income community. Furthermore, under Action Alternative 1, there would be no change to land use at MRS and no new land use activities that might potentially impact surrounding populations would be introduced. Large trucks entering and leaving MRS during construction of the replacement seawater system would follow local haul routes and measures identified in the TCP. Therefore, there would be no disproportionate or high adverse effects on low-income or minority populations from implementation of Action Alternative 1.

NO-ACTION ALTERNATIVE

Manchester CDP is not considered a minority or low-income community. Furthermore, under the No-Action Alternative, there would be no construction of new or replacement facilities at the MRS and no changes in land use. Therefore, there would be no disproportionate or high adverse effects on low-income or minority populations from the No-Action Alternative.

4.19.4 Mitigation Measures

No mitigation measures are proposed for impacts associated with environmental justice.

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4.20 CUMULATIVE EFFECTS

This section describes the potential for cumulative effects (i.e., additive or interactive effects) that would result from the incremental impact of the Proposed Action, when added to other past, present, and reasonably foreseeable future actions (regardless of the agency or person undertaking such actions). Reasonably Foreseeable Future Actions are those actions that are reasonably certain to occur in the project area based on funded projects with existing plans. In accordance with 40 CFR 1508.7 and as detailed in Council for Environmental Quality guidance entitled *Considering Cumulative Effects Under NEPA*, agencies should analyze the potential cumulative effects that may occur when considering a proposed action "added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions."

The following recent past, present, and foreseeable actions have been identified within the vicinity of the Proposed Action:

- **NOAA NMFS Manchester Research Facility Electrical Upgrade Project:** This project is located on the NOAA property and involves installation of new and replacement transformers and other electrical equipment and replacing the underwater cable which provides electrical power to the EPA pier (NOAA 2022). All of the project components are located within or immediately adjacent to building footprints or on grounds that have been previously disturbed. The only upland ground disturbances will be for the new utility transformer installation near Building 21 and the Building 2 transformer replacement. Concrete pads will be placed to support the new transformers and will require excavation of up to 6 inches in depth of topsoil for the new 3 foot by 4 foot concrete pads. The only component that involves in-water work is the replacement of approximately 2,200 feet of the underwater power cable that runs across Clam Bay from the northeast corner of the NOAA property to existing EPA pier. The existing cable lies on top of the sediment in Clam Bay and its replacement will be accomplished by divers and surface support equipment. Construction for this project is anticipated to begin in early 2023 and to last approximately 18 months.
- **Manchester Fuel Depot Modernization Project:** The US Navy is upgrading its Manchester Fuel Depot facility to replace the original World War II-era cement USTs with modern, above-ground steel tanks (US Department of the Navy 2018). The project will consist of closing and removing the original underground fuel storage tanks and constructing six new above-ground tanks over three phases, within the area east of Little Clam Bay, approximately 2,000 feet southeast of the MRS property. Each of the six tanks will be able to contain an estimated 5.245 million gallons of JP-5 carrier jet fuel or F-76 marine diesel fuel in 64-foot-tall, 140-foot-wide tanks constructed of welded steel columns with supported fixed cone roofs. Construction started in July 2021 and is anticipated to take nine years to complete (Kitsap Daily News 2021).
- **East Hillsdale Road Culvert Replacement Project:** Approximately 4,000 feet west of the NOAA property. The proposed project is in the design phase, with construction anticipated June to December 2024. This project will replace the failing 36-inch CMP culvert (Kitsap County 2022a).

- **Beach Drive Stormwater Retrofit and Bike Lanes Project:** Approximately 1 mile west of the NOAA property. The proposed project began design in May 2019. No construction start date has been announced. This proposed project will retrofit existing ditches with bioretention and will expand the roadway prism to add a shoulder/bike lane along the Puget Sound water's edge (Kitsap County 2022b).

4.20.1 Preferred Alternative

The Preferred Alternative would have no impacts with respect to land use, wetlands, floodplains, or farmlands, and therefore could not contribute to cumulative impacts related to these resource topics.

The Preferred Alternative would have potential negligible or minor adverse impacts with respect to geological resources, climate change and sea level rise, air quality, water resources and hydrological processes, recreational resources, cultural resources, flora and fauna, coastal zone management, noise, transportation, utilities and solid waste, visual resources, hazardous materials, and public services resource topics. Most of these potential impacts would be limited to the immediate vicinity of the NOAA property and, where necessary, mitigated such that they would not substantially combine with other off-site impacts. As discussed in Section 4.3, impacts relating to climate change are inherently cumulative in nature due to their global context, so no further discussion of cumulative climate change impacts is required in this section.

Those impacts of the Preferred Alternative that could potentially combine with the impacts of other recent past, present or future projects listed above are discussed in turn below.

GEOLOGICAL RESOURCES

The Preferred Alternative would implement mitigation measures to reduce the potential impacts from landslide hazards at the NOAA property. Although one of the cumulative projects (the electrical upgrade project) is also located on the NOAA property, it would not involve any ground disturbance or other activities within or near the slope behind Building 13 that is identified as having moderate landslide and erosion potential. Therefore, the electrical upgrade project would not have any potential to cause impacts to landslide hazards that might combine with the Preferred Alternative. The cumulative impact would be *negligible*.

WATER RESOURCES AND HYDROLOGICAL PROCESSES

The Preferred Alternative could have potential minor impacts directly to stormwater quality and indirectly to nearby waterbodies such as Clam Bay and Puget Sound and would implement best management practices and mitigation measures to reduce potential impacts. The four cumulative projects listed above could also have similar impacts to stormwater quality. The electrical upgrade project would involve ground disturbance near some of the proposed areas of disturbance from the Preferred Alternative. That project could potentially impact water quality in Clam Bay, as could the US Navy project just south of the MRS. The two County projects are distant enough from the NOAA property that stormwater impacts would not combine directly; however, all four cumulative projects could indirectly affect water quality

within Puget Sound. All of the cumulative projects would reduce potential impacts through implementation of standard sediment control and erosion BMPs such that impacts beyond the immediate ground disturbance areas for each project would not be substantial. The cumulative impact would be *negligible*.

CULTURAL RESOURCES

The Preferred Alternative would have no impact on built-environment historic resources or known archaeological resources and would implement standard protocols for inadvertent discovery to reduce potential impacts to previously unknown archaeological resources that may be present on the MRS site. All the cumulative projects would also implement similar accidental discovery protocols, such that potential impacts to previously unknown archaeological resources at the MRS site (electrical upgrade), on adjacent properties (fuel depot modernization) or wider area (County projects) would be minimized. The cumulative impact would be *negligible*.

FLORA AND FAUNA

The Preferred Alternative would implement mitigation measures to reduce potential impacts to nesting birds or from the spread of invasive plant species. Nesting bird impacts are typically limited to an approximately 50-foot-radius of construction activities for passerines, and approximately 300-foot-radius for raptors. The three off-site cumulative projects are distant enough from the NOAA property that any localized impacts to flora and fauna from those projects would not combine with the mitigated impacts of the Preferred Alternative, and those projects would also be required to implement procedures, if necessary, to avoid take under the MBTA or Bald and Golden Eagle Protection Act. The electrical upgrade project on the NOAA site would be undertaken in previously disturbed areas of the site and therefore would not disturb vegetation or require tree removals that could potentially cause additional disruption to birds in the area. The cumulative impact would be *negligible*.

NOISE

The Preferred Alternative would implement mitigation measures to reduce potential impacts from construction noise. The two County projects are distant enough from the NOAA property that construction noise at these project sites would not be heard by the same sensitive receptors hearing noise from construction of the Preferred Alternative. While the electrical upgrade project would occur on the NOAA property at the same time as construction of the Preferred Alternative, construction of that project would not require prolonged use of heavy equipment or other substantial noise-generating equipment. Therefore, construction noise impacts from both of these projects combined, would not be perceptibly different to the impacts of the Preferred Alternative only, at the nearest residential receptors. Construction of the US Navy project would require substantial use of heavy equipment and noise-generating machinery. However, there are no sensitive residential uses that are within 1,000 feet of the main construction zones for both projects. Any cumulative impact from construction noise would therefore be *negligible*.

TRANSPORTATION

None of the cumulative projects would permanently increase traffic volumes in the project area that could combine with the negligible increase in operational traffic associated with the Preferred Alternative. Construction-related traffic for the two County projects is unlikely to utilize the section of Beach Drive East near the NOAA property. The electrical upgrade project would generate minimal construction traffic and would not require any construction within or alteration to the internal road system within the NOAA property; therefore, there would be no cumulative impact relating to traffic safety or disruption to emergency access at the MRS would occur from these two projects. The US Navy project would result in construction-related traffic (worker commute trips and heavy truck trips for equipment and soil hauling) on Beach Drive East to the south of the MRS, at the same time as construction-related traffic generated by the Preferred Alternative. The additional traffic from both projects could result in a *short-term, minor* cumulative impact. The Proposed Action's contribution to the cumulative impact be minimized by implementation of standard temporary traffic control BMPS as described in Section 4.14.4.

HAZARDOUS MATERIALS

The Preferred Alternative would implement mitigation measures to reduce potential impacts from the potential existing soil contamination at the site and potential to encounter remnant buried asbestos-clad piping. Ground disturbance associated with the electrical upgrade project could also potentially encounter remnant piping or potential contaminated soil, and one component (Building 2 transformer replacement) is within an area mapped as having residual petroleum contamination. However, both projects would be subject to the institutional controls for work within known contamination areas, which requires contractors to utilize safety protocols normally applicable for UST removals and for excavations to be observed by a qualified environmental professional. The nearby US Navy project would have an overall long-term beneficial impact relating to hazardous materials, due to the replacement of old, potentially leaking USTs with more modern, aboveground tanks. While there could be potential impacts relating to spills or accidental releases from that project, strict spill prevention and pollution control measures would be implemented, and such impacts would not combine with the localized, minor to moderate impacts of the Preferred Alternative. The cumulative impact would be *negligible*.

4.20.2 No-Action Alternative

The No-Action Alternative would involve no construction activities and no increase in staff numbers or intensity of site use. Because there would be no physical changes or intensification of use at the site, there would be no impacts to the environment that could potentially contribute to cumulative impacts related to these resource topics.

4.20.3 Action Alternative 1

The anticipated effects of Action Alternative 1 with consideration of the past, present, and reasonably foreseeable future actions would be similar to those described for the Preferred Alternative, except that contribution of Action Alternative 1 to construction-related cumulative impacts would be less due the shorter duration and smaller construction area compared to the Preferred Alternative.

5 COMMUNITY INVOLVEMENT

5.1 EA PUBLIC COMMENT PERIOD

This Draft EA was made available for public comment over the minimum 30-day period from November 22, 2022 to December 22, 2022. A notice of availability for public access via print and electronic editions to review the Draft EA was published on the NOAA website, and also in the classified section of the Kitsap Sun newspaper on November 22, 2022 and November 27, 2022.

5.2 TRIBAL CONSULTATION

NEPA calls for federal agencies to invite the participation of any affected federally recognized Native American tribe in the environmental review process. In addition, Government-to-Government Relationship with Tribal Governments, guided by a Presidential Memorandum dated September 23, 2004 and EO 13175 dated November 6, 2000, require that federal agencies observe a government-to-government relationship with federally recognized tribal governments. NOAA has initiated contact with federally recognized tribes on October 11, 2022 and invited further comment on the Proposed Action (see Appendix A-2). The public notice of availability for the Draft EA was also sent on November 22, 2022.

Tribes Contacted:

- Suquamish Tribe
- Muckleshoot Indian Tribe
- Stillaguamish Tribe
- Tulalip Tribe
- Skokomish Tribe and
- Port Gamble S'Klallam Tribe.

One tribe, the Stillaguamish Tribe, requested additional information about the Proposed Action prior to publication of the Draft EA. NOAA met with the Stillaguamish Tribe on October 31, 2022. The meeting focused mainly on future opportunities for science collaboration and the future of NOAA science that used to take place at the now-closed Mukilteo Research Station. There were no concerns identified by the Stillaguamish Tribe regarding the Proposed Action during this meeting.

One tribe, the Suquamish Tribe, responded to the public notice of availability of the Draft EA. NOAA met virtually with tribal representatives on January 5, 2023. The Suquamish Tribe then provided follow up written comments which covered the same topics discussed on the call. A copy of their comment letter is included in Appendix A.

NOAA also reached out to the non-Federally recognized Duwamish Tribal Organization on October 11, 2022 and sent the public notice of availability on November 22, 2022. The Duwamish Tribal Organization responded to the notice of availability and NOAA staff met virtually with representatives of the organization on December 20, 2022. Follow up written comments were provided the same day. A copy of the comment letter is included in Appendix A.

5.3 AGENCY CONSULTATION

Electronic copies of the Draft EA were made available to the following potentially affected regulatory agencies and other stakeholders:

Neighboring Properties:

- Environmental Protection Agency, Manchester Environmental Laboratory
- Manchester State Park
- NAVSUP FLCPS - Manchester Fuel Depot

Federal Agencies:

- National Oceanic and Atmospheric Administration, National Marine Fisheries Service
- U.S. Army Corps of Engineers, Regulatory Branch
- U.S. Army Corps of Engineers, Seattle District
- Environmental Protection Agency, Region 10
- U.S. Fish and Wildlife Service, Pacific Region

State Agencies:

- WA State Department of Transportation (WSDOT), Olympic Region
- WA Department of Natural Resources (WDNR), South Puget Sound Region
- WA Department of Fish & Wildlife, Natural Resources Building
- WA Department of Ecology, Northwest Region Office
- WA State Department of Ecology, Coastal Zone Management Program
- WA State Department of Ecology, Shorelands and Environmental Assistance
- WA Department of Ecology, Hazardous Waste and Toxics Reduction Program
- WA Department of Ecology, Headquarters
- WA Department of Archaeology and Historic Preservation, Project Review

Local/Regional Agencies/Stakeholders:

- Kitsap County Public Works
- Kitsap History Museum
- Kitsap County Department of Community Development
- Kitsap County Commissioner's Office, Kitsap County Board of Commissioners, District 3

Feedback on the Proposed Action was received from these agencies during the public comment period:

- United States Environmental Protection Agency, Region 10
- Washington Department of Ecology, Hazardous Waste and Toxics Reduction Program
- Washington Department of Ecology, Coastal Zone Management Program
- United Stated Army Corps of Engineers

Copies of the comment letters are provided in Appendix A.

6 SUMMARY OF POTENTIALLY SIGNIFICANT IMPACTS AND SUGGESTED MITIGATION MEASURES

Potentially significant impacts have been identified for the Proposed Action when implemented using either the Preferred Alternative or Action Alternative 1, with respect to the following environmental resource topics:

- water resources and hydrological processes
- recreational resources
- flora and fauna
- wetlands
- noise
- transportation
- hazardous materials

Mitigation measures are recommended to avoid or reduce these potentially significant impacts.

A summary of potential impacts by environmental resource for each action alternative analyzed, as well as a summary of BMPs and mitigation measures to be considered, as necessary, to support a finding of no significant impact is provided in Table 6-1.

No anticipated environmental impacts were identified in relation to the No-Action Alternative.

Anticipated permits and approvals required for the Proposed Action are listed in Table 6-2.

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Table 6-1 Summary of Potential Impacts, Mitigation Measures, and Anticipated Regulatory Compliance

Resources - Phase	Impacts of Preferred Alternative	Impacts of Action Alternative 1	Recommended Mitigation, Best Management Practices, and Anticipated Regulatory Compliance
Land Use	No impact	No impact	None
Geological Resources	Minor	Minor	**BMPs** for erosion control in accordance with a Stormwater Pollution Prevention Plan (SWPPP) developed in compliance with EPA's Construction General Permit (CGP). See Water Resources & Hydrological Processes, below. **Comply** with OSHA Excavation Standards (29 CFR Part 1926 Subpart B).
Climate Change and Sea Level Rise – Construction	Minor	Minor	**Comply** with Puget Sound Clean Air Agency rules and regulations pertaining to emission standards for construction equipment. See Air Quality, below.
Climate Change and Sea Level Rise – Operation	Minor	Negligible	**BMPs** in accordance with CEQ's Guiding Principles for Sustainable Federal Buildings. **Optional measures** that could be implemented to further reduce GHG emissions, if desired: - Design of new buildings to be LEED certified. - Installation of electric vehicle charging station(s). - Planting of trees. - Installation of solar panels.
Air Quality – Construction	Minor	Minor	**Comply** with Puget Sound Clean Air Agency rules and regulations pertaining to emission standards for construction equipment. **BMPs** for dust control and reducing equipment emissions during construction, including: • Watering exposed surfaces. • Covering haul trucks transporting loose material. • Removing visible mud or dirt track-out onto adjacent public roads. • Limit vehicle speeds on unpaved areas. • Complete paving and grading work in a timely manner, and lay building pads as soon as possible after grading. • Minimize idling times.

Resources - Phase	Impacts of Preferred Alternative	Impacts of Action Alternative 1	Recommended Mitigation, Best Management Practices, and Anticipated Regulatory Compliance
			• Maintain construction equipment as per manufacturer's specifications.
Air Quality - Operation	Minor	Negligible	None
Water Resources and Hydrological Processes - Construction	Minor	Minor	**Mitigation Measure 4.17-1: Environmental Media Management Plan** (see Hazardous Materials, below). **BMPs** for erosion/stormwater control and spill prevention in accordance with a SWPPP to avoid release of sediment and construction debris into nearby marine, estuarine, and riverine habitats (Clam Bay and Beaver Creek). The SWPPP would be prepared in accordance with EPA's Construction Stormwater General Permit, and would contain a Temporary Erosion and Sediment Control Plan. Impact avoidance and minimization measures and standard construction BMPs that would be included in the SWPPP are listed below: • The number of access routes, size of staging areas, and the size of the active construction sites shall be limited to the minimum necessary to achieve project objectives and the staging, storage equipment laydown, access routes, and parking areas would be established on paved or previously disturbed areas to the extent feasible. • Standard construction site erosion control measures such as silt fencing and covering of stockpiles shall be used where sediment from exposed slopes could erode and enter drainage facilities. Areas of disturbed soils that slope toward drainages would be stabilized when not actively used to reduce erosion potential. • If work is conducted during the wet season October 1 through April 30, stockpiled fill materials and excavation spoils shall be covered. • Silt fencing shall be installed around all areas of disturbed soil, stockpiled fill materials, and excavation spoils. • A clean construction site shall be maintained to reduce the potential for debris entering surface waters. Any debris that enters the water shall be contained, removed, and disposed of at an upland location. • The contractor shall be required to maintain construction equipment and vehicles to prevent them from leaking fuel or lubricants. Refueling shall occur in paved areas of the site, away from water bodies.

Resources - Phase	Impacts of Preferred Alternative	Impacts of Action Alternative 1	Recommended Mitigation, Best Management Practices, and Anticipated Regulatory Compliance
			• Procedures to prevent or respond to leaks, spills, or other releases of pollutants shall be established and implemented. • Monitoring and inspections by qualified personnel shall be undertaken to verify permit compliance. Inspections and any corrective actions shall be documented.
Water Resources and Hydrological Processes - Operation	Minor	Negligible	**Mitigation Measure 4.5-1: Maintain Pre-development Hydrology.** Site planning, design, construction, and maintenance strategies shall be implemented to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow. Design of new impervious surfaces (buildings and paved areas) shall utilize low-impact design and/or "green infrastructure" elements to avoid any direct discharge of stormwater to waterbodies. **Mitigation Measure 4.17-1: Environmental Media Management Plan.** (See Hazardous Materials, below). **Comply** with Section 438 of the Energy Independence and Security Act, which requires that the predevelopment hydrology of the property be maintained or restored, to the maximum extent technically feasible.
Recreational Resources - Construction	Minor	Minor	**Mitigation Measure 4.13-2: Preconstruction Coordination and Notification** (see Noise, below). **Comply** with Puget Sound Clean Air Agency rules and regulations pertaining to emission standards for construction equipment. See Air Quality, above.
Recreational Resources – Operation	No Impact	No Impact	None
Cultural Resources –	Negligible to No Impact	Negligible to No Impact	**BMPs** and standard protocols for inadvertent discoveries, if encountered, would be followed in consultation with DAHP and in accordance with 36 CFR 800 (Protection of Historic Properties) and 43 CFR Part 10 (Native American Graves Protection and Repatriation Act).
Flora and Fauna - Construction	Minor	Minor	**Mitigation Measure 4.8-1: Noxious Weed Control**. • Revegetate disturbed areas, as needed, with a native seed mix to prevent the spread or establishment of invasive species.

Resources - Phase	Impacts of Preferred Alternative	Impacts of Action Alternative 1	Recommended Mitigation, Best Management Practices, and Anticipated Regulatory Compliance
			• To prevent the establishment and spread of invasive species, assess populations of noxious weeds and treat weed populations prior to the start of ground-disturbing activities. • Use weed-free project staging areas and avoid or minimize travel through areas where noxious weed infestations have been documented. • Ensure that construction equipment arriving on site has been cleaned prior to entry. Clean all equipment before leaving the project site. • New or replacement landscape plantings shall use native species wherever practicable. **Mitigation Measure 4.8-2: Pre-Construction Surveys for Nesting Birds**. A qualified biologist shall survey the project footprint and appropriate survey radii (determined by the biologist based on the species) for migratory birds and their nests prior to construction. If breeding birds are identified, implement appropriate buffers (determined by the biologist based on the species) to prevent unintentional take through nest abandonment or failure. No construction activities shall occur within the buffers until the biologist confirms that activities may recommence. **BMPs** for erosion/stormwater control in accordance with a SWPPP. See Water Resources & Hydrological Processes, above.
Flora and Fauna - Operations	Negligible to Minor	Negligible	None
Wetlands - Construction	No Impact	No Impact	**Mitigation Measure 4.9-1: Wetland Delineation and Avoidance.** Prior to construction (including any ground-disturbance or vegetation removal) within 100 feet of the small wetland that is present to the west of the main driveway and southwest of Building 22, NOAA shall retain a qualified wetland scientist to conduct a formal wetland delineation in accordance with the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region. Based on the wetland function and rating, the wetland scientist shall recommend an appropriate vegetation protection zone width and other measures to avoid or minimize sedimentation and turbidity into the wetland. At a minimum such measures shall include:

Resources - Phase	Impacts of Preferred Alternative	Impacts of Action Alternative 1	Recommended Mitigation, Best Management Practices, and Anticipated Regulatory Compliance
			• Installation of high-visibility fencing around the wetland (including the recommended vegetation protection zone width) to prevent access by personnel or equipment during construction. • Installation of erosion and sediment controls, including silt fencing, compost socks, and/or straw wattles between the fenced protection zone and nearby construction work areas. • Stabilization of exposed soils, including stockpiles, in construction areas adjacent to and/or upslope of the wetland. **BMPs** for erosion/stormwater control in accordance with a SWPPP. See Water Resources & Hydrological Processes, above.
Wetlands - Operation	No Impact	No Impact	None
Floodplains	No Impact	No Impact	**BMPs** for erosion/stormwater control in accordance with a SWPPP. See Water Resources & Hydrological Processes, above.
Coastal Zone Management	Negligible	Negligible	**Comply** with the federal Coastal Zone Management Act and Washington State's Coastal Zone Management Program by submitting a Coastal Consistency Determination (included here as Appendix B) to Ecology to demonstrate project consistency with these regulations.
Farmlands	No Impact	No Impact	None
Noise - Construction	Moderate	Moderate	**Mitigation Measure 4.13-1: Restrict construction hours**. Restrict noise-generating construction activities to between the hours of 7:00 a.m. to 10:00 p.m., where feasible. **Mitigation Measure 4.13-2: Preconstruction coordination and notification**. Minimize noise impacts at the Manchester State Park campground through preconstruction coordination and notification with the State Parks Department. **BMPs** for construction noise: • Route truck traffic away from residential areas and sensitive receptor locations such as schools or parks, to the extent practicable. • Turn off equipment when not in use and prohibit unnecessary idling of internal combustion engines.

Resources - Phase	Impacts of Preferred Alternative	Impacts of Action Alternative 1	Recommended Mitigation, Best Management Practices, and Anticipated Regulatory Compliance
			• Locate stationary noise-generating equipment such as air compressors or portable power generators as far as practicable from sensitive receptors. • Equip all internal combustion engine-driven equipment with intake and exhaust mufflers that in are in good condition and appropriate for the equipment.
Noise - Operation	Negligible	Negligible	None
Transportation - Construction	Minor	Minor	**Mitigation Measure 4.14-1: Utilize a designated haul route.** Construction-related truck traffic shall utilize the preferred haul route along Beach Drive East and Colchester Road to Mile Hill Road. Heavy construction vehicle and equipment movement shall be minimized during peak rush hours. **Mitigation Measure 4.14-2: Preconstruction coordination and notification.** The construction contractor shall meet with site operations personnel at NOAA and EPA to coordinate time windows and durations of internal roadway closures necessary for construction activity. **Mitigation Measure 4.14-3: Develop a roadway closure and traffic detours plan**. This plan shall be developed with consultation and approval from site operations personnel at NOAA and EPA. Additional temporary parking needs shall be addressed as well as allowable time windows and the duration of roadway closures for various stages of construction. **BMPs** for construction traffic control: • Provide early notification to staff and visitors about upcoming construction and expected disruptions to traffic flow. • Utilize signage to indicate detours or road closures, where applicable. • Avoid obstructions to pedestrian areas and provide clear pedestrian walkways if obstructions cannot be avoided.
Transportation - Operational	Negligible	None	None
Utilities and Solid Waste –	Negligible	Negligible	None

Resources - Phase	Impacts of Preferred Alternative	Impacts of Action Alternative 1	Recommended Mitigation, Best Management Practices, and Anticipated Regulatory Compliance
Construction and Operation			
Visual Resources – Construction and Operation	Negligible	Negligible	None
Hazardous Materials - Construction	Minor to Moderate	Minor to Moderate	**Mitigation Measure 4.17-1: Environmental Media Management Plan**. Prepare an Environmental Media Management Plan to assist NOAA and construction personnel in managing contaminated soils, dewatering water, or remnant site features that may be encountered during construction earthwork activities to minimize impacts on the environment and on worker and public health and safety. The Environmental Media Management Plan shall include procedures to be employed during ground disturbing activities within the Former Fire Training Area (see Figure 4.17-1) to minimize risks associated with handling or disposal of potentially contaminated soils or groundwater, or asbestos-clad piping. NOAA shall consult and coordinate with the EPA Region 10 Remedial Project Manager and with the US Army Corps of Engineers Project Manager in developing the EMMP. The Environmental Media Management Plan shall include, at a minimum, the following components: • Soil Management Plan • Sampling and Analysis Plan • Contingency Asbestos Handling Plan • Contingency Dewatering Plan **Mitigation Measure 4.17-2: Implement Institutional Controls**. NOAA and its contractors shall implement and adhere to the following site institutional controls (USACE et al 2012; USACE 2019): within the restricted areas (areas where TPH impacts remain in soil) or UST areas of the former Fire Training Area (see Figure 4.17-1): • Design future storm water runoff systems to divert runoff away from the UST areas.

Resources - Phase	Impacts of Preferred Alternative	Impacts of Action Alternative 1	Recommended Mitigation, Best Management Practices, and Anticipated Regulatory Compliance
			• Notify contractors and employees working in subsurface excavations of the need to utilize health and safety precautions normally applicable to UST removals. • Excavations shall be observed by a qualified environmental professional to determine if exposed soils contain free product. If free product is encountered, excavated soils shall be disposed of in an appropriate off-site landfill. If free product is not encountered, the soils may be returned to the original excavation, or very close to the original excavation in a substantially similar environment. • Temporary storm water controls and other BMPs, such as temporary soil covers and subsurface liners, shall be used to minimize infiltration and runoff of soil materials. **Mitigation Measure 4.17-3: Site-Specific Health and Safety Plan.** The contractor shall develop a site-specific health and safety plan outlining procedures to protect worker health and safety during all site development and construction activities, in accordance with 29 CFR 1910.120. Site-specific investigation reports relating to petroleum, dioxin, and PFAS contamination at the site should be provided to the contractor by NOAA, to inform the development of appropriate health and safety measures. **BMPs** for spill control and erosion/sediment control in accordance with a SWPPP. See Water Resources & Hydrological Processes, above.
Hazardous Materials - Operation	Negligible	Negligible	**Mitigation Measure 4.17-2: Implement Institutional Controls** (see above).
Public Services	Negligible	Negligible	None
Cumulative Effects	Negligible	Negligible	None

Table 6-2 Anticipated Regulatory Permits or Approvals

Agency	Regulation	Permit/Application
US Environmental Protection Agency	National Pollutant Discharge Elimination System	Construction Stormwater General Permit
Advisory Council on Historic Preservation and Tribal Historic Preservation Officer	Section 106 – National Historic Preservation Act	No Adverse Effects Determination; consultation
Washington Department of Ecology, Coastal Zone Management Program	Coastal Zone Management Act	Coastal Consistency Determination
Kitsap County	Stormwater Management Ordinance (KCC Title 12)	Review requirements; consult
Kitsap County	Buildings and Construction Ordinance (KCC Title 14)	Review requirements; consult
Kitsap County	Critical Areas Ordinance (KCC Title 19)	Review requirements; consult

Acronyms: KCC = Kitsap County Code

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7 CONCLUSION

The findings of this EA indicate that no significant effects would result from implementation of the Proposed Action using either the Preferred Alternative or Action Alternative 1, assuming standard BMPs and mitigation measures discussed in Section 4 and provided in Table 6-1 are implemented.

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