DRAFT ENVIRONMENTAL ASSESSMENT

NOAA Marine Operations Center – Pacific Homeport Site Alternatives

PREPARED FOR:

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

URS PROJECT NO. 28645073

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LIST OF ACRONYMS AND ABBREVIATIONS

°F	degrees Fahrenheit
ACM	asbestos containing material
ACZA	Ammoniacial Copper Zinc Arsenate
amp	ampere
AST	aboveground storage tank
ASTM	American Society of Testing and Materials
bgs	below ground surface
BMP	Best Management Practice
BTEX	benzene, toluene, ethylbenzene, and xylenes
CAA	Clean Air Act
CFR	Code of Federal Regulations
CO	carbon monoxide
CSZ	Cascadia Subduction Zone
CZMA	Coastal Zone Management Act
CZMP	Coastal Zone Management Program
CWA	Clean Water Act
DAHP	Department of Archaeological and Historic Preservation
dBA	A-weighted decibels
DLCD	Oregon Department of Land Conservation and Development
DNS	Determination of Non-Significance
DOGAMI	Oregon Department of Geology and Mineral Industries
DPS	Distinct Population Segment
EA	Environmental Assessment
EEZ	Exclusive Economic Zone
EFH	Essential Fish Habitat
EFSEC	Energy Facility Site Evaluation Council
EIS	Environmental Impact Statement
EMS	Emergency Management System
EO	Executive Order
ESA	Endangered Species Act
ESU	Ecologically Significant Unit
Fed/OSHA	Federal Occupational Safety and Health Administration
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FMP	Fishery Management Plan
FPPA	Farmland Protection Policy Act
FY	Fiscal Year
GCR	General Conformity Rule
GHG	greenhouse gas

HAPC	Habitat Area of Particular Concern
HMSA	Hazardous Materials Storage Area
I-5	Interstate 5
IBC	International Building Code
JARPA	Joint Aquatic Resource Permit Application
LEED	Leadership in Energy and Environmental Design
LEED-NC	Leadership in Energy and Environmental Design – New Construction
L_{eq}	sound level equivalent
L_{max}	sound level maximum
L_{min}	sound level minimum
LOS	Level of Service
MBTA	Migratory Bird Treaty Act
MHHW	mean higher high water
MLLW	mean lower low water
MOC-P	Marine Operations Center – Pacific
MSA	Metropolitan Statistical Area
MSL	mean sea level
$mtCO_2e$	metric tons of carbon dioxide equivalent
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NGVD	National Geodetic Vertical Datum
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRHP	National Register of Historic Places
NOS	National Ocean Service
NO_2	nitrogen dioxide
NO_X	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NWFSC	Northwest Fisheries Science Center
O_3	ozone
OAR	Oregon Administrative Rule
OCMP	Oregon Coastal Management Program
ODEQ	Oregon Department of Environmental Quality
ODOT	Oregon Department of Transportation
ODSL	Oregon Department of State Lands
OHW	ordinary high water
OLW	ordinary low water
OMAO	Office of Marine and Aviation Operations
ORCAA	Olympic Regional Clean Air Agency
ORMA	Ocean Resource Management Act
ORS	Oregon Revised Statute
OSU	Oregon State University

PAH	polyaromatic hydrocarbon
PCB	polychlorinated biphenyl
PFMC	Pacific Fisheries Management Council
Phase I ESA	Phase I Environmental Site Assessment
$PM_{2.5}$	particulate matter (less than 2.5 micros in diameter)
PM_{10}	particulate matter (less than 10 micros in diameter)
PSCAA	Puget Sound Clean Air Agency
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
REC	Recognized Environmental Condition
RHA	Rivers and Harbors Act
RP	Recommended Provisions
SEPA	State Environmental Policy Act
SFO	Solicitation for Offers
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SMA	Shoreline Management Act
SMC	Seattle Municipal Code
SMP	Shoreline Master Program
SO_2	sulfur dioxide
SPCC	Spill Prevention, Control and Countermeasure
STC	sound transmission coefficient
TPH-D	Total Petroleum Hydrocarbons as Diesel
TPH-G	Total Petroleum Hydrocarbons as Gasoline
UFC	Unified Facilities Criteria
U.S.	United States
USACE	U.S. Army Corps of Engineers
USC	U.S. Code
USCGS	U.S. Coast and Geodetic Survey
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
USGBC	U.S. Green Building Council
USGS	U.S. Geological Society
VOC	volatile organic compound
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WDGER	Washington Division of Geology and Earth Resources
WDNR	Washington Department of Natural Resources
WDOE	Washington Department of Ecology
WNHP	Washington Natural Heritage Program
WRC	Western Regional Center

EXECUTIVE SUMMARY

This section summarizes the proposed action, alternatives considered, and the environmental review process. A table of potential project effects, followed by a summary of recommended mitigation measures, is also presented. Figures showing the location of each site alternative analyzed are provided as an attachment to this document.

PROPOSED ACTION

The National Oceanic and Atmospheric Administration (NOAA) Office of the Chief Administrative Officer is proposing to establish a new lease for the Marine Operations Center – Pacific (MOC-P). The current lease expires June 30, 2011. The lessor of the selected site will, depending on the site selected, develop and/or refurbish a facility to meet requirements for MOC-P as outlined in the Solicitation for Offers (SFO). The MOC-P is one of two regional centers operated by the NOAA Office of Marine and Aviation Operations (OMAO). Under the proposed action, OMAO would provide administrative and logistical support to ten research vessels distributed within its area of responsibility. The selected MOC-P site would be a permanent homeport for four NOAA vessels and be able to accommodate up to six NOAA vessels in total.

The existing MOC-P at Lake Union in Seattle is currently supporting administrative functions; however, its shops, boathouse, marine piers and in-water infrastructure are not operational due to fire damage sustained in July 2006. NOAA's long-term lease for this property is set to expire in June 2011. NOAA intends to lease property and anticipated improvements that meet an established U.S. Department of Commerce SFO. Offers from entities throughout the Pacific Northwest are being evaluated to identify the alternative that best meets NOAA's requirements.

Upland Facilities – The leased land and facilities would be prepared to NOAA requirements and specifications. In general, this operating lease will include upland and submerged land areas for five distinct MOC-P facilities: (1) Administration Building, (2) Shops Complex (Electronics, Boat Shed, and Maintenance), (3) Warehouse and storage areas, (4) Piers and Berths, and (5) Specialized Site Area (e.g., contractor trailer, storage of hazardous materials). Upland property would support approximately 31,100 rentable square feet of interior spaces; in-water requirements include 1,560 linear feet of dedicated, large-ship pier, 400 linear feet of small boat pier, and 20,000 square feet of exterior lay-down space. For staff and visitor parking, NOAA will require 75 to 100 on-site reserved parking spaces. Of these, 50 spaces shall be secured and lit in accordance with specified security requirements.

In-Water Facilities – The MOC-P in-water pier requires 1,560 useable linear feet of large-ship pier frontage space, or 260 linear feet for each of up to 6 vessels. The desirable pier width is 30 feet, with a minimum acceptable pier width of not less than 25 feet overall and at least 20 feet of usable width. Large vessels may range from 215 to 224 feet in length, 43 feet in width (beam) and 21 feet (maximum) in draft below waterline. MOC-P also requires 400 useable linear feet of small boat pier space (i.e., float dock). An additional 10,000 square feet of lay-down space is required for sites more than 10 driving miles from the NOAA Western Regional Center (WRC) in Seattle, Washington. Sites more than 50 miles from the NOAA WRC in Seattle, Washington must provide an additional 50 secure parking spaces.

ALTERNATIVES ANALYSIS

In September 2007, NOAA initiated research for a market assessment designed to gather and analyze information on prospective homeport locations within the site search area. Potential sites were initially identified, port owners contacted, and site visits were conducted between February and June 2008. Sites evaluated during the market assessment include 22 berthing options at 17 properties.

Solicitation for Offers (SFOs) were sought by NOAA from U.S. harbors in the greater Puget Sound area, including ports as far north as Bellingham and as far west as Port Angeles, Washington. The SFOs were extended south beyond the Columbia River to ports along the Oregon coast to Newport, Oregon and southeast to Portland, Oregon on the Willamette River (Barrows, 2008). Offers for facilities at the following four locations were received in response to the SFO:

- 1801 Fairview Ave East, Inc., Lake Union, Seattle, Washington (existing MOC-P). This Site Alternative is hereafter referred to as Site Alternative 1 or the Lake Union site.
- Port of Port Angeles, Port Angeles, Washington (Terminal 3). This Site Alternative is hereafter referred to as Site Alternative 2 or the Port Angeles site.
- Port of Bellingham, Bellingham, Washington (Bellingham Shipping Terminal). This Site Alternative is hereafter referred to as Site Alternative 3 or the Bellingham site.
- Port of Newport, Newport, Oregon (Dock 2). This Site Alternative is hereafter referred to as Site Alternative 4 or the Newport site.

No-Action Alternative

The No-Action Alternative analyzed in this EA assumes continuation of the status quo and no new comprehensive upland and in-water facility for MOC-P. Under this scenario, the current

lease for existing MOC-P facilities will eventually lapse. All NOAA vessels typically homeported at MOC-P, including the NOAA Ship *Shimada* coming on-line in 2009, would be berthed indefinitely at temporarily arranged berths in the Pacific Northwest. Preparation for cruises and dockside vessel support would occur at various unknown ports made available to NOAA.

The No-Action Alternative is not preferred and would reduce MOC-P's overall ability to meet its mission and budget efficiently and effectively.

Site Alternative 1: Lake Union

Site Alternative 1 is the existing location of the NOAA MOC-P homeport facility. It is located at 1801 Fairview Avenue East, Seattle, Washington, within King County, on the eastern shore of Lake Union, as shown on **Figure 2**. The site is generally flat, with elevations ranging from approximately 27 feet above mean sea level (MSL) at the lake edge, to approximately 47 feet above MSL at the eastern boundary of the site.

Site Alternative 1 is approximately 1.97 acres in size (landward of the bulkhead sheetpile wall) and includes approximately 6.35 acres of Lake Union (lakeward of the bulkhead sheetpile wall). The majority of the site (including all landward portions) is owned by 1801 Fairview Avenue East, LLC. A portion of the site (within the lake) is owned by WDNR. The site is located in an urban, mixed use setting. WRC is approximately 7.2 drivable miles from the site.

Site Alternative 2: Port Angeles

Site Alternative 2 is within the Port of Port Angeles and the adjacent Port Angeles Harbor, located north of the intersection of Marine Drive and Tumwater Street in Port Angeles, Washington, as shown on **Figure 6**. The site is located within Clallam County. The site consists of approximately 5.41 acres of upland area and approximately 1.7 acres of submerged land within the harbor. It is comprised of whole or portions of several individual land parcels, all of which are owned by the Port of Port Angeles. The site is located in a heavy industrial setting. WRC is approximately 80 drivable miles from the site.

Apart from a steep, rocky shoreline, the site is generally flat with an elevation of approximately 7 feet MSL. The majority of the site is currently used for automobile parking and as dry storage for boats, with a warehouse on the eastern portion. Upland and in-water portions of the site have been historically used for log storage/sorting, however this operation has been relocated further to the west within the Port.

Site Alternative 3: Bellingham

Site Alternative 3 is located within the Port of Bellingham, at 627 and 631 Cornwall Avenue in Bellingham, Washington, as shown on **Figure 10**. The site is located within Whatcom County. The site is approximately 86 drivable miles from the WRC in Seattle.

The site comprises approximately 6.5 acres of upland area and approximately 3.58 acres of submerged lands within the harbor and adjacent to the Whatcom Waterway. The site includes portions of three separate land parcels: two of which are owned by the Port of Bellingham and the other by the WDNR, though managed by the Port of Bellingham through a Port Management Agreement. The site is located in a formerly occupied heavy industrial setting.

The site is generally flat, with an average elevation of approximately 15 feet above MLLW (Aspect, 2009). The majority of the site is currently paved, with a large warehouse structure (Warehouse One) near the northern corner, and a former maintenance shop to the southeast of the warehouse. A small section along the northeastern boundary is unpaved. The site has historically been used as a shipping terminal, and a portion of the site was used to store salt associated with the adjacent (former) Georgia-Pacific Mill facility.

Site Alternative 4: Newport

Site Alternative 4 is within the Port of Newport and Yaquina Bay, as shown on **Figure 14**, located at 2000 OSU Drive in Newport, Oregon, Lincoln County. The site is approximately 300 drivable miles from the WRC in Seattle.

The site comprises approximately 5 acres of upland area and approximately 1.2 acres of Yaquina Bay. The site is owned by the Port of Newport. The site is located in an area zoned for water-dependent and water-related activities, including marine research and educational facilities.

The site is generally flat, although the northern portion of the site is terraced approximately six feet lower than the southern portion, ranging from 14 to 20 feet above MSL (Port of Newport, 1980). The site contains a former pumping station, several container storage units, two docks, and a former fish farming complex with abandoned fish ladders, flumes and ponds, as shown on **Figure 15**. The southwestern portion of the site, along with adjacent land to the south, is currently lease to and used by Yaquina Bay Fruit Processors. The northern portion of the site (including the westernmost dock) is currently leased to and used by Carvahlo Fishing for fish buying operations. Prior to the mid-1980s, the site was used as a salmon farming operation.

ENVIRONMENTAL REVIEW PROCESS

National Environmental Policy Act

In accordance with Section 102 of the National Environmental Policy Act of 1969 (NEPA) under 42 U.S. Code [USC] §4332, and Council on Environmental Quality Regulations for Implementing Procedural Provisions of NEPA at 40 Code of Federal Regulations (CFR) 1500-1508, NOAA has evaluated the environmental effects of implementing any one of four potential action alternatives, as well as the No-Action Alternative. Using NOAA Administrative Order 216-6, *Environmental Review Procedures for Implementing the NEPA*, as amended May 1999, NOAA has analyzed and considered the potential environmental effects of its proposed action before commitment to a specific course of action.

If NOAA concludes that the Final EA supports a Finding of No Significant Impact (FONSI), an Environmental Impact Statement (EIS) would not be required. This Draft EA identifies anticipated environmental effects and, if applicable, suggested mitigation measures that could be expected to reduce environmental effects.

Summary of Anticipated Impacts

A summary of potential impacts due to implementation of the Proposed Action follows in **Table ES-1**. No significant unavoidable adverse impacts to any environmental resource have been identified.

Table ES-1: Summary of Impacts

Environmental Resource	No-Action Alternative	Site Alternative 1: Lake Union	Site Alternative 2: Port Angeles	Site Alternative 3: Bellingham	Site Alternative 4: Newport
Land Use	No impacts.	No impacts.	No impacts.	No impacts.	No impacts.
Geological Resources	No impacts.	Erosion could occur if slopes greater than a 15% grade are constructed. The site could experience earthquakes, moderate ground shaking, and high liquefaction.	Erosion could occur if slopes greater than a 15% grade are constructed. The site could experience earthquakes, high levels of ground shaking, moderate to high liquefaction, and tsunamis.	Erosion could occur if slopes greater than a 15% grade are constructed. The site could experience earthquakes, high levels of ground shaking, high liquefaction, and tsunamis.	Erosion could occur if slopes greater than a 15% grade are constructed. The site could experience earthquakes, severe ground shaking, ground rupture, high liquefaction, and tsunamis.
Air Quality	Air and greenhouse gas emissions would be negligible.	Project-related operational emissions, marine-based activities, and greenhouse gas emissions would be less than significant.	Same as Site Alternative 1.	Same as Site Alternative 1.	Same as Site Alternative 1.
Water Resources	Treated wood pilings may be contributing to effects upon the water quality of Lake Union, as chemicals (e.g., creosote, arsenic, chromium, copper) may leach from the wood.	During construction, the replacement of sections of pilings and installation of new pilings could temporarily degrade water quality as sediments are disturbed and resuspended.	Upland construction activities could temporarily degrade nearshore harbor surface water. Eastern areas of the site have been identified as having petroleum hydrocarbon-impacted soils. Release of these soils to the harbor could impact water quality. Installation of new pilings could	Upland construction activities could temporarily degrade nearshore surface water quality. Installation of dolphins, other new pilings and the bulkhead would result in short-term degradation of water quality when sediments are disturbed and resuspended.	Upland construction activities could temporarily degrade nearshore harbor surface water. Installation of new pilings could temporarily degrade water quality.

Environmental Resource	No-Action Alternative	Site Alternative 1: Lake Union	Site Alternative 2: Port Angeles	Site Alternative 3: Bellingham	Site Alternative 4: Newport
			temporarily degrade water quality.		
Recreational Resources	No impacts.	No impacts.	No impacts.	No impacts.	No impacts.
Cultural Resources	No impacts.	The site has a moderate probability for containing buried cultural resources. Below-fill construction and utility installation, if any, could disturb natural sediments along the former beach and shoreline resulting in potential direct impacts to resources.	The site has a moderate to high probability for containing buried cultural resources. Below-fill construction and utility installation, if any, could disturb natural sediments along the former beach and shoreline resulting in potential direct impacts to resources.	Same as Site Alternative 1.	Same as Site Alternative 1.
Flora and Fauna	Allowing the shoreline to remain in its existing condition would continue to perpetuate the low-quality aquatic habitat conditions.	The short-term effects of construction on aquatic species would be localized and less than significant. Long-term effects to fish and aquatic vegetation from shading by overwater structures would be a moderate impact.	Temporary impacts to migratory birds are likely to occur due to disturbance in nesting habitats. Impacts to flora and fauna during construction would be moderate due to the habitat loss and dredging. Shading from the overwater structures would be a moderate impact.	Temporary impacts to migratory birds are likely to occur due to disturbance in nesting habitats. Impacts to flora and fauna during construction would be minor due to the limited scope of in-water work. Shading from the overwater structures would be a moderate impact.	Temporary impacts to migratory birds are likely to occur due to disturbance in nesting habitats. Impacts to flora and fauna during construction would be moderate due to the number of species impacted, the direct habitat loss, and dredging. Shading from the overwater structures would be a moderate impact.

Environmental Resource	No-Action Alternative	Site Alternative 1: Lake Union	Site Alternative 2: Port Angeles	Site Alternative 3: Bellingham	Site Alternative 4: Newport
Essential Fish Habitat (EFH)	Existing conditions would remain as a low-quality salmon EFH area. Due to the limited extent of anticipated in-water activities and absence of HAPC, the extent of potential adverse effects is considered to be less than significant, provided that appropriate mitigation measures are implemented.	EFH would be adversely affected during construction. Due to the limited extent of anticipated in-water activities and absence of HAPC, the extent of potential adverse effects is considered to be less than significant, provided that appropriate mitigation measures are implemented.	EFH would be adversely affected during construction, including the addition of new over-water structures, and dredging. Due to the extent of anticipated in-water activities and limited presence of HAPC, the extent of potential adverse effects is considered to be less than significant, provided that appropriate mitigation measures are implemented.	EFH would be adversely affected during construction, including the extension of the existing over-water structure. Due to the limited extent of anticipated in-water activities and limited presence of HAPC, the extent of potential adverse effects is considered to be less than significant, provided that appropriate mitigation measures are implemented.	Near-shore marine EFH would be adversely affected during construction, including the addition of new over-water structures. Due to the extent of anticipated in-water activities and limited presence of HAPC, the extent of potential adverse effects is considered to be less than significant, provided that appropriate mitigation measures are implemented.
Wetlands and Navigable Waters	No impacts.	Pile stubbing and installation of piling extensions may be necessary within navigable waters of the U.S. and the state of Washington, potentially affecting navigation.	Removal and installation of pilings and dredging may be necessary within navigable waters of the U.S. and the state of Washington, potentially affecting marine navigation.	Removal and installation of pilings may be necessary within navigable waters of the U.S. and the state of Washington, potentially affecting marine navigation.	Removal and installation of pilings and dredging for adequate berth depths may be necessary within navigable waters of the U.S. and state of Oregon, potentially affecting marine navigation.
Floodplains	No impacts.	No impacts.	The proposed pier extension of Terminal 3 could be impacted by flooding, and the structure may affect the characteristics of flooding in the area by	No impacts.	If the major earthworks proposed lower the elevation, the entire site could be within the 100-year floodplain. Buildings may be subject to flooding.

Environmental Resource	No-Action Alternative	Site Alternative 1: Lake Union	Site Alternative 2: Port Angeles	Site Alternative 3: Bellingham	Site Alternative 4: Newport
			altering the way in which floodwaters and waves circulate. The site could be affected by storm surge during large storm events, however the magnitude of the surge would likely be somewhat abated by the protection of Ediz Hook.		The proposed dock could be impacted by flooding, particularly if the finished level of the dock is below the predicted elevation of the 100-year flood event The dock may affect the characteristics of flooding in the area by trapping debris against the piles of the dock and/or altering the way in which floodwaters circulate/flow within the bay. The site has potential to be affected by storm surge during large storm events.
Coastal Zone Management	No impacts.	No impacts.	No impacts.	No impacts.	No impacts.
Agricultural Resources	No impacts.	No impacts.	No impacts.	Negligible effects on aquaculture would arise from short-term impacts to water quality during construction.	Minor, short-term impacts to the Hatfield Marine Science Center's Molluscan Broodstock Program could occur from short-term impacts to water quality during in-water construction.
Noise	No impacts.	Construction noise would not be significant at sensitive noise receptors.	Construction noise would have an impact to adjacent areas only and would not be significant at sensitive noise receptors.	Same as Site Alternative 2.	Same as Site Alternative 2.

Environmental Resource	No-Action Alternative	Site Alternative 1: Lake Union	Site Alternative 2: Port Angeles	Site Alternative 3: Bellingham	Site Alternative 4: Newport
Transportation	No impacts.	Under the worst-case scenario, this alternative would generate approx. 365 additional daily trips, with approx. 263 trips occurring during the a.m. peak hour and approx. 215 trips occurring during the p.m. peak hour. However, this would not result in a significant impact to transportation.	Under the worst-case scenario, this alternative would generate approx. 455 daily trips, with approx. 367 trips occurring during the a.m. peak hour and approx. 305 trips occurring during the p.m. peak hour. However, this would not result in a significant impact to transportation. Vehicles currently using the site as a parking lot would need to find parking elsewhere in the vicinity.	Under the worst-case scenario, this alternative would generate approx. 455 daily trips, with approx. 367 trips occurring during the a.m. peak hour and approx. 305 trips occurring during the p.m. peak hour. However, this would not result in a significant impact to transportation.	Same as Site Alternative 3.
Utilities and Solid Waste	No impacts.	No impacts.	The following utilities would need to be extended to serve the new pier: potable water, electricity, sanitary sewer, and fire protection.	No impacts.	The existing power supply would need to be upgraded from a source approximately 1500 feet to the south. The new supply is likely to be underground.
Visual and Aesthetic Resources	From a regional context this alternative would have a moderate negative effect.	The anticipated visual impact would be positive, albeit minor.	Same as Site Alternative 1.	Same as Site Alternative 1.	The visual effect would be moderate given views from the U.S. 101 off ramps and the Yaquina Bay Bridge, and direct views from commercial/retail waterfronts supporting tourism.
Hazardous	No impacts.	Construction is likely to	There is potential for	There is potential for	There is potential for

Environmental Resource	No-Action Alternative	Site Alternative 1: Lake Union	Site Alternative 2: Port Angeles	Site Alternative 3: Bellingham	Site Alternative 4: Newport
Materials		have minor impacts on the known soil or groundwater contaminants at upland portions of the site. Construction activities and ongoing operation of the MOC-P homeport facility could impact potentially contaminated lakebed sediments. Preparation work for the renovations of the administration and warehouse/laboratory buildings, and demolition of the boat storage and shop buildings, would require removal of ACM and any lead-based paints. Moored vessels may be fueled via fuel trucks, increasing the risk of accidental spills or leaks. If vessels mooring at the facility require hazardous materials to be loaded or unloaded from the vessels, the risk of accidental spills or leaks would increase.	spills of hazardous materials if the AST is not properly closed, and if the hazardous materials in the shop building are not property disposed of. There is potential for ACM or lead-based paint to be present within the existing maintenance shop building. The proposed replacement of the bridge, sheet piling and trestles over Tumwater Creek would result in soil disturbance in the eastern portions of the site, and therefore could impact contaminated sediments and groundwater. Construction activities and ongoing operation could impact potentially contaminated marine sediments. Moored vessels may be fueled via fuel trucks, increasing the risk of accidental spills or leaks. If vessels mooring at	spills of hazardous materials if the shop building is not emptied of hazardous materials prior to demolition and properly disposed of. There is known ACM and lead-based paint within the existing warehouse to be demolished. There may be light fixtures containing PCBs and mercury or sodium vapor within both existing buildings on site. Disturbance of contaminated sediments and/or groundwater for building foundations could adversely affect the health and safety of workers, or could result in the migration of contaminants. Construction activities and ongoing operation could impact contaminated marine and nearshore sediments. Moored vessels may be fueled via fuel trucks, increasing the risk of	spills of hazardous materials if the generator, fuel pipes, and ASTs are not completely emptied and decontaminated and properly disposed of. There is potential for ACM or lead-based paint to be present within the existing pumphouse building. Planned earthworks could impact contaminated sediments and groundwater, if such contamination exists. Construction activities and ongoing operation of the MOC-P homeport facility could impact potentially contaminated marine sediments. Moored vessels may be fueled via fuel trucks, increasing the risk of accidental spills or leaks. If vessels mooring at the facility require hazardous materials to be loaded or unloaded from the vessels, the risk of accidental spills or leaks would increase.

Environmental Resource	No-Action Alternative	Site Alternative 1: Lake Union	Site Alternative 2: Port Angeles	Site Alternative 3: Bellingham	Site Alternative 4: Newport
			the facility require hazardous materials to be loaded or unloaded from the vessels, the risk of accidental spills or leaks would increase.	accidental spills or leaks. If vessels mooring at the facility require hazardous materials to be loaded or unloaded from the vessels, the risk of accidental spills or leaks would increase.	
Socio-economics	Long-term economic effects would be moderate considering the lack of a central MOC-P headquarters for its entire staff, contractors, and interrelated functions.	Short-term economic effects would be positive. Long-term effects are considered to be minimal given the size and diversity of economic activity within the community and Census Tract. Effects on the local population would be negligible.	Short-term economic effects would be positive. Long-term effects are also considered to be positive. There would be a slight increase in local population. The long-term effect on employment would be negligible.	Same as Site Alternative 2.	Short-term economic effects would be positive. Long-term effects are also considered to be positive. The economic effect would be minor, relative to the local economy.
Cumulative Impacts	No impacts.	No impacts.	No impacts.	No impacts.	No impacts.

MITIGATION

The following is a summary of suggested mitigation measures for each of the site alternatives, presented by environmental resource. It is expected that the lessor will mitigate potential effects by following the usual permitting and regulatory requirements and compliance with the requirements of the SFO. A complete set of suggested mitigation measures is provided in Section 7 of the EA.

There are no recommended measures for the following environmental resources: land use, air quality, recreational resources, noise, transportation, utilities and solid waste, visual and aesthetic resources, and socio-economics.

Geological Resources

For Site Alternatives 1, 2, 3 and 4 - Use of the standards outlined in the SFO which in general include Recommended Provision 6, *Standards for Existing Federally Owned and Leased Buildings*, the International Building Code for new buildings, and Unified Facilities Criteria 4-152-01, *Design for Piers and Wharfs*.

Water Resources

For Site Alternatives 1, 2, and 3 – Impacts to water quality would be minimized by implementing measures that would result in adherence to the following regulations: water quality restrictions imposed by the WDOE (Chapter 173-201A WAC), and waste material disposal per WAC 220-110-070. Example mitigation measures are suggested.

For Site Alternative 4 – Impacts to water quality would be minimized by implementing measures that would result in adherence to the water quality standards imposed by ODEQ (OAR 340-041). Example mitigation measures are suggested.

Cultural Resources

For Site Alternatives 1, 2, 3 and 4 - As no adverse effects to known historic, archaeological, or cultural resources were identified, no mitigation is necessary. However, it is possible that deeply buried, intact archeological deposits are present below the fill. If NOAA proceeds with one of these alternatives, mitigation commensurate with future plans of development may be appropriate.

Flora and Fauna

For Site Alternatives 1, 2, and 3 - Impacts to aquatic species and habitats would be minimized by implementing measures that result in adherence to the following regulations: waste material

disposal per WAC 220-110-070; and water quality restrictions imposed by the WDOE (Chapter 173-201A WAC). Example mitigation measures are suggested.

For Site Alternative 4 - Impacts to aquatic species and habitats would be minimized by implementing measures that result in adherence to the water quality standards imposed by ODEQ (OAR 340-041). Suggested measures include a pre-construction survey for short-stemmed sedge and actions to minimize adverse impacts to eelgrass beds, shell fish beds, and fish spawning and nursery areas.

For Site Alternatives 2 and 4, which require dredging, planning and construction practices are suggested.

Essential Fish Habitat

For Site Alternatives 1, 2, 3, and 4 - The same recommended measures as for Flora and Fauna apply to minimize the potential for impacts to Essential Fish Habitat, along with additional recommended planning and construction practices.

Wetlands

For Site Alternatives 1, 2, and 3 - A JARPA should be completed and submitted for coordination with the USACE under Section 10 of the RHA and Sections 404 and 401 of the CWA, the WDOE and locally affected governments.

For Site Alternative 4 - The proposed project would require review and approval under the state of Oregon Removal Fill Law (ORS 196.800 through 196.990), Section 10 of the RHA and Sections 404 and 401 of the CWA. The OSL, the DLCD and the USACE have designed a streamlined process for reviewing permit applications for fill and removal permits. Their joint permit form is submitted after the local county planning department has reviewed and signed it.

Floodplains

Site Alternatives 2 and 4 appear to be within a base flood plain. The lessor must ensure compliance with the requirements of the SFO as it pertains to base floodplains, and be consistent with Executive Order 11988.

Coastal Zone Management

For Site Alternatives 1, 2 and 3 - The Washington State coastal program's federal consistency coordinator should be consulted regarding review under the WDOE CZMP application process.

For Site Alternative 4 - The Oregon State coastal program's federal consistency coordinator should be consulted regarding review under the OCMP application process.

Agricultural Resources

For Site Alternative 4 - Advance notification of the schedule for proposed in-water activities should be provided to the Hatfield Marine Science Center's Molluscan Broodstock Program, so that necessary changes, such as the frequency of water filter monitoring and replacement, could be undertaken by the Program during this period.

Hazardous Materials

For Sites 1, 2, 3, and 4 - implement recommendations within a Phase I Environmental Site Assessment accepted by NOAA; comply with state and federal RCRA hazardous waste generation and disposal, and hazardous materials use and storage notification requirements; implement an appropriate soil/sediment handling and disposal approach; implement an asbestos demolition survey and abatement plan for proposed building demolitions and/or renovations; implement a lead-based paint demolition survey and abatement plan for the proposed building demolitions and/or renovations.

For Site Alternatives 2 and 3 – Prepare a hazardous materials closure plan to address the storage of hazardous materials at the site, including any existing aboveground storage tanks (ASTs), and obtain approval of this plan by the WDOE; develop an appropriate hazardous materials storage and management plan, in compliance with WDOE Tier II Reporting (if applicable).

For Site Alternatives 2, 3, and 4 – comply with 40 CFR Part 112, regulating petroleum-storage tanks and mandating preparation of a Spill Prevention, Control, and Countermeasures Plan, if applicable.

For Site Alternative 4 - comply with local, state and federal regulations and proper standards of care during removal of any hazardous materials prior to demolition, transfer of such materials to another location, and/or disposal of such materials, emptying, cleaning and removal of ASTs, and disconnection and removal of the diesel generator; develop an appropriate hazardous materials business plan in compliance with local and state requirements.

1 INTRODUCTION

The National Oceanic and Atmospheric Administration (NOAA) Office of the Chief Administrative Officer is proposing to establish a new lease for the Marine Operations Center – Pacific (MOC-P). The current lease expires June 30, 2011. The lessor of the selected site will, depending on the site selected, develop and/or refurbish a facility to meet requirements for MOC-P as outlined in the Solicitation for Offers (SFO). The MOC-P is one of two regional centers operated by the NOAA Office of Marine and Aviation Operations (OMAO). Under the proposed action, OMAO would provide administrative and logistical support to ten research vessels distributed within its area of responsibility. The selected MOC-P site would be a permanent homeport for four NOAA vessels and be able to accommodate up to six NOAA vessels in total.

The existing MOC-P at Lake Union in Seattle is currently supporting administrative functions; however, its shops, boathouse, marine piers and in-water infrastructure are not operational due to fire damage sustained in July 2006. NOAA's long-term lease for this property is set to expire in June 2011. NOAA intends to lease property and anticipated improvements that meet an established U.S. Department of Commerce SFO. Offers from entities throughout the Pacific Northwest are being evaluated to identify the alternative that best meets NOAA's requirements.

In accordance with Section 102 of the National Environmental Policy Act of 1969 (NEPA) under 42 U.S. Code [USC] §4332, and Council on Environmental Quality Regulations for Implementing Procedural Provisions of NEPA at 40 Code of Federal Regulations (CFR) 1500-1508, NOAA has evaluated the environmental effects of implementing any one of four potential action alternatives, as well as the No-Action Alternative. Using NOAA Administrative Order 216-6, *Environmental Review Procedures for Implementing the NEPA*, as amended May 1999, NOAA has analyzed and considered the potential environmental effects of its proposed action before commitment to a specific course of action.

Since the proposed action does not qualify for a Categorical Exclusion, and the need for an Environmental Impact Statement (EIS) is uncertain, a NEPA Environmental Assessment (EA) has been prepared. If NOAA concludes that the Final EA supports a Finding of No Significant Impact, an EIS would not be required. This Draft EA identifies anticipated environmental effects and recommends mitigation measures, if applicable, that would be expected to reduce environmental effects to insignificant levels.

2 PURPOSE AND NEED

The NOAA OMAO and its Commissioned Officer Corps, or NOAA Corps, manage and operate marine and aviation facilities in support of NOAA programs throughout the nation. The NOAA Corps is an integral part of NOAA, and the smallest of the seven uniformed services of the United States. The purpose of the proposed action is to meet OMAO's mission to safely and efficiently operate NOAA ships (and aircraft), incorporate emerging data acquisition technologies, and provide a specialized professional team responsive to NOAA programs. NOAA Corps professionals are also trained in engineering, earth sciences, oceanography, meteorology, fisheries science, and other related disciplines.

NOAA Corps marine officers assume positions of leadership and command in the operation of ships; in the conduct of field projects on land, at and under the sea; in the management of NOAA observational and support facilities; as members or leaders of research efforts; and in the management of various organizational elements throughout NOAA. The original Corps worked almost exclusively in hydrographic and geodetic operations. Currently, the NOAA Corps consists of approximately 300 professionals conducting remote, hazardous, or otherwise arduous duties, frequently on short notice. NOAA Corps officers are supported by non-commissioned wage marine crew for ship operations during cruises scheduled each year.

The OMAO currently operates 18 research ships nationwide, nine are associated with its Marine Operations Center – Atlantic and nine are associated with its existing MOC-P. Of the vessels supported by MOC-P, three are berthed at a home port in Honolulu, Hawaii: NOAA Ships *Oscar Elton Sette*, *Ka'imimoana* and *Hi'iaiakai*. Two MOC-P vessels are homeported in Alaska: NOAA Ships *Fairweather* and *Oscar Dyson*. The NOAA Ship *David Starr Jordan* is typically berthed in San Diego. MOC-P vessels currently homeported in Seattle are NOAA Ships *McArthur II*, *Miller Freeman*, and *Rainier*. OMAO's newest ship, NOAA Ship *Bell M Shimada*, is expected to be homeported at MOC-P, increasing the number of MOC-P vessels to ten. NOAA Ship *John N Cobb* was not included in the number of active NOAA vessels at MOC-P as it was decommissioned in August 2008. Specifications for each of the large vessels to receive long-term berths at MOC-P are provided in **Appendix A**. Based on past experience and foreseeable operations, these vessels operate within the northern Pacific Ocean in both near shore and deep sea environs.

The need for the proposed action is to establish a centralized MOC-P facility that provides critical management, operational and logistical support to NOAA vessels and programs. These programs are generated by various NOAA Line Offices, such as the National Marine Fisheries Services (NMFS) and the National Ocean Service, that are located at the NOAA Western

Regional Center (WRC) and the Montlake Northwest Fisheries Science Center (NWFSC) in Seattle, and other locations in the Western U.S.

The existing MOC-P is located at 1801 Fairview Avenue East on Lake Union in Seattle and has occupied this location since 1963. Its officer and administrative staff count is approximately 75 individuals. Ships' crews associated with the four vessels recently home-ported at MOC-P comprise approximately 115 personnel. From the existing MOC-P location, approximately 146 researchers deploy, primarily from April through September, on these or other NOAA vessels. In July 2006 a fire destroyed the MOC-P piers, boat shed, and machine shop at Lake Union. Since then, MOC-P vessels have been temporarily berthed at various piers in the Puget Sound area. Administrative and warehouse functions at MOC-P continue at the Lake Union property. NOAA's long-term lease at this location expires in June 2011.

NOAA is considering responses to its SFO from offerors through a source selection process to determine which offer represents the best value to NOAA. The factors considered in making the best value determination are identified in the SFO. As part of the competitive leasing process, a market assessment was prepared to identify potential sites that met NOAA's requirements in a delineated area that ran from harbors of the greater Puget Sound area, including US waterside properties north to Bellingham; west to Port Angeles; south to the Columbia River, including Astoria, Oregon; along the Oregon coast to Newport, Oregon; and southeast to Portland, Oregon on the Willamette River (Barrows, 2008). Any party within the delineated area was free to respond to the SFO advertised on the Federal Business Opportunities web site.

3 PROPOSED ACTION

3.1 LEASE

NOAA proposes to lease property and facilities for its MOC-P facility and operate and maintain NOAA assets at a selected homeport location within the Pacific Northwest. Physical and operational requirements for MOC-P have been defined by NOAA for upland and in-water environments in its SFO, and in a draft market assessment (Barrows, 2008). To implement its proposed action, NOAA will select a site through the source selection process and then award a lease to the owner of the selected site. The successful lessor will design, secure permits and construct all improvements that meet NOAA's SFO.

The leased land and facilities would be prepared to NOAA requirements and specifications, as outlined in the SFO. In general, this operating lease will include upland and submerged land areas for five distinct MOC-P facilities: (1) Administration Building, (2) Shops Complex (Electronics, Boat Shed, and Maintenance), (3) Warehouse and storage areas, (4) Piers and Berths, and (5) Specialized Site Area (e.g., contractor trailer, storage of hazardous materials). Upland property would support approximately 31,100 rentable square feet of interior spaces; in-water requirements include 1,560 linear feet of dedicated, large-ship pier, 400 linear feet of small boat pier, and 20,000 square feet of exterior lay-down space. These features are further defined below.

The lease of land and in-water areas would be for a term of up to 20 years. The terms and conditions contained within the SFO would prevail throughout the term of the lease (U.S. Department of Commerce, 2008). Specific proposed actions by NOAA for lease acquisition and MOC-P operation and maintenance are identified below. A description of how the proposed action would be implemented for each of four Site Alternatives, and a No-Action Alternative, are described in Section 4 below.

Award of a NOAA lease will trigger development or redevelopment of a selected Site Alternative that best meets the NOAA and MOC-P homeport mission and operations, with the design, permitting, and construction or renovation of all in-water and upland facilities needed to meet MOC-P/NOAA's homeport needs provided by the owner of the selected port entity.

NOAA Operations Research and Facilities funding would be used to lease property and maintain NOAA assets under the proposed action.

3.2 UPLAND FACILITIES

A programming study was prepared for each type of space requirement as established by NOAA (Barrows, 2008). NOAA intends to enter into a long-term lease for approximately 31,100 rentable square feet (RSF) of administrative, shop and warehouse space. Administrative space is estimated at 17,100 RSF; shop space is approximately 8,600 RSF; and, warehouse space is approximately 5,400 RSF. In addition, 20,000 SF of laydown area for outdoor storage is required (U.S. Department of Commerce, 2008).

Programming requirements were established by determining the number of net square feet (NSF) required for each occupied building space. Depending on the type of space, a usable square feet (USF) is estimated by multiplying by a "circulation factor" for rooms and circulation, such as hallways and corridors. Finally, an estimated RSF requirement was determined by applying an "add-on" factor for anticipated mechanical equipment rooms and systems.

Because some warehouse space can be provided at the NOAA WRC in Seattle, space requirements at prospective sites located more than 50 miles from that facility must provide an additional 4,875 RSF of warehouse and related space for a total of 10,275 RSF. For sites located more than 100 miles from WRC, an additional 9,750 RSF of warehouse space for a total of 15,150 RSF is required.

For staff and visitor parking, NOAA will require 75 to 100 on-site reserved parking spaces. Of these, 50 spaces shall be secured and lit in accordance with specified security requirements. The cost of this parking will be included as part of the lease and handicap parking shall be provided in accordance with local code. Selected port alternatives located greater than 50 miles (one hour travel time) from the NOAA WRC will be required to provide an additional 50 spaces of secure, long-term parking (U.S. Department of Commerce, 2008).

Selected port alternatives located more than ten driving miles from the NOAA WRC provide 10,000 square feet of outdoor storage space. This space may be provided on-site or within 10 driving miles of the site. If the storage space is provided off-site the space must be fenced and secured with a padlock or similar device. Specific details proposed for upland facilities are discussed for each site in Section 4 of this report, below.

NOAA-required interior space will be located in a quality building of sound and substantial construction as described in its SFO. NOAA will require use of the building roof for the installation, operation and maintenance of antenna(s). NOAA intends to acquire by lease the structures described below, also specified in its SFO.

Environmentally preferable products and materials will be used to the extent practicable (U.S. Department of Commerce, 2008). Emphasis will be placed on the use of environmentally

preferable products, such as those found in the U.S. Environmental Protection Agency's (USEPA) Environmentally Preferred Purchasing) and U.S. Department of Agriculture's (USDA) BioPreferred programs (USEPA, 2009a; USDA, 2009a). Also emphasized is the use of products that are extracted and manufactured regionally.

For existing buildings, NOAA has encouraged use of Energy Savings Performance Contracts or utility agreements to achieve, maintain, and/or exceed the ENERGY STAR Benchmark Score of 75 (Energy Star, 2009). All new construction shall achieve an ENERGY STAR score of 75 or above within 18 months after reaching 80 percent occupancy and must retain the qualifying ENERGY STAR score or better. Incandescent bulbs shall not be used. NOAA encourages that the site be served by utilities that provide at least fifty percent of the site's electricity from renewable sources.

The project will meet the requirements of LEED®-NC (Leadership in Energy and Environmental Design for New Construction) Silver level (minimum), with certification from the U.S. Green Building Council (USGBC) within 12 months of project occupancy. Silver certification will be met using the latest version of LEED®-NC Reference Guide (USGBC, 2009) at the time of submittal. Should LEED® certification not be documented within 12 months of project occupancy, NOAA may implement a corrective action program to achieve LEED® certification.

The project will comply to the extent feasible with the Resource Conservation and Recovery Act (RCRA), Section 6002, 1976. NOAA will make use of recycled content products, such as those designated by the USEPA in the Comprehensive Procurement Guidelines, 40 CFR Part 247, and its accompanying Recovered Materials Advisory Notice. These guidelines list the designated recycled content products.

3.2.1 Administration Building

The Administration Building(s) complex will consist of established minimum space for each the following functions:

- Command Suite
- Budget Office/ Resource Management
- Marine Personnel Branch
- Marine Operations
- Marine Engineering Branch
- Electronics Engineering Branch
- Shared Administrative Areas

- Information Technology
- Health Services
- Museum/ Archives.

3.2.2 Shops Complex

The three components that make up the Shops Complex are Electronics Shop, Boat Shed and Maintenance Shops. These facilities are more industrial than the Administration Building, but have more technical requirements than the Warehouse.

Electronics Engineering Branch Shop - The Electronics Engineering Branch includes office areas as well as an Electronics Shop, where electronic equipment is repaired and assembled. Some offices will require privacy, while others will be open work stations. The engineering technician work spaces will include a desk space as well as work bench and storage. All work stations will require proximity to shop areas. The mock-up area requires work benches, while the secure storage space will be used for laptop computers, Deemed Export, and highly sensitive equipment. The federal definition of a deemed export is an export of technology or source code (except encryption source code) that is "deemed" to take place when it is released to a foreign national within the U.S. A "deemed" export situation can occur by access/use in research or training, visual inspection, or an oral exchange of information.

Boat Shed - The boat shed provides storage for boats and everyday use by staff. Small boat repair happens here. Fork-lifts and cherry pickers require easy access to this space and shall be stored here. The boat shed could be located in the same building as the warehouse and should be accessible by water. This area will include compressed air and shall incorporate the steam boiler.

Maintenance Shops - The shop area includes spaces for the Maintenance Mechanic, the Wood Shop, Machine Shop, Paint Booths and Tool Room. A restroom, shower and emergency shower shall also be included in this area.

3.2.3 Warehouse

General warehouse space is required that includes a conventional high bay facility. A total of 5,400 RSF is anticipated for this type of use, either in a single building or in multiple buildings. It will include an office for shipping/receiving and be in close proximity to the hazardous materials storage and Marine Engineering Branch functions. Additional warehouse space is needed depending on a site's distance from the WRC (see Section 3.2 Upland Facilities).

The warehouse requires a loading area to accommodate maneuvering space for large vehicles including semi-tractor trailers. A minimum turning radius of 19 feet 10 inches inside radius and 42 feet 0 inches outside radius is required.

3.3 IN-WATER FACILITIES

The MOC-P in-water pier requires 1,560 useable linear feet of large-ship pier frontage space, or 260 linear feet for each of up to 6 vessels. The desirable pier width is 30 feet, with a minimum acceptable pier width of not less than 25 feet overall and at least 20 feet of usable width. Large vessels may range from 215 to 224 feet in length, 43 feet in width (beam) and 21 feet (maximum) in draft below waterline. MOC-P also requires 400 useable linear feet of small boat pier space.

The pier(s) must be able to sustain at least 500 pounds live load per square foot for all berths. These may be existing structures or may require removal and/or installation of pier support pilings, piers, approach structures and related elements to meet NOAA requirements. Actions presumed necessary for each Site Alternative are described in Section 4 of this EA. Piers will be managed by NOAA and NOAA will be the sole occupant to avoid conflicts with other vessels. The lessor will be responsible for maintenance and repair of in-water structures. Other requirements for piers and other in-water elements at or adjacent to the selected site (to be determined) are:

- Utility service connections up to the pier
- Pier fire sprinkler system designed to meet applicable codes for all timber piers
- A minimum of 168 linear feet at the entrance between piers (more than 250 linear feet preferred)
- A minimum of 105 linear feet between a pier and any fixed obstruction; including, but not limited to, houseboats and shorelines parallel to berths (more than 126 linear feet is preferred)
- NOAA must be able to perform dockside/topside maintenance and repair at its MOC-P facility. This includes, but is not limited to, inside and outside hotwork, abrasive blasting and other inside and outside abrasive activities.

3.4 UTILITIES AND OTHER SERVICES

NOAA requires the following utilities, security and maintenance services to be provided to the selected site: water, sewer, phone, cable, electrical, gas, steam, land and water access security, waste disposal and janitorial services. Utility services will be extended to on-site structures and to berthing stations at the large vessel pier sand small craft docks.

Existing abandoned electric, telephone and data cabling and devices as well as any other improvements or fixtures in place will be removed to accommodate the approved MOC-P layout

and design. This may include demolition of existing structures or substructures. Any demolition shall be completed in accordance with all applicable laws.

Anticipated electrical requirements include 480 volt / 800 amperes (amp) 3-phase power and standard 220/110 volt alternating current service outlets on-site and extended to each berthing station. Telephone and communication services include up to six telephone lines, cable television and fiber optic internet access on-site and extended to berthing stations. Potable water service providing 40 to 60 pounds per square inch will be provided on-site and extended to berthing stations, as will connections to local sewer services. A 10,000 kilowatt boiler will be located within a secure and enclosed building and will be used to generate steam for distribution to selected large vessel berthing locations via conduit able to support 75 pounds per square inch.

Security services and infrastructure will consist of the following major categories:

- Physical safety of staff, contractors, and visitors in compliance with Interagency Security Committee standards for a Level III facility, including guard service at all times and exterior security fencing except in public parking areas (Interagency Security Committee, 2001).
- Protection measures against unwanted intrusion (by land and by sea), vandalism and theft through the use of physical and electronic means in compliance with a Level III facility.
- Protection measures for data and networks, with special attention to the server room. Safeguarding archives and historical items through use of physical and electronic means, including intrusion monitoring, surveillance and alarms systems.
- Security alarms extended to each large vessel berthing station on the pier structures.

These services and features will be established in coordination with security experts from the Region Security Office of the Department of Commerce.

3.5 MOC-P RELOCATION, OPERATION AND MAINTENANCE

Temporary relocation of NOAA personnel and certain equipment would occur under the No-Action Alternative and under the proposed action at Site Alternative 1, both of which involve the property at the existing MOC-P in Seattle. Permanent relocation would occur under the proposed action for each of three other site alternatives located outside of Seattle. It is unknown how many of the current 75 NOAA personnel working from the existing MOC-P at Lake Union would relocate, if one of the site alternatives outside of Seattle is chosen. For the purposes of this analysis, it is assumed that as many as 70 NOAA personnel could relocate. It is unknown how many of the approximately 115 ship's crew supporting the four vessels assigned to the existing

MOC-P facility would decide to relocate if a site outside of Seattle is selected. Other ships' crew would be recruited and hired from each location as necessary.

While not stationed at MOC-P, approximately 150 researchers per year may deploy on vessels stationed at the proposed MOC-P. Most of these (approximately 80 percent) are from the WRC and Montlake NWFSC in Seattle, with the remainder from other NOAA laboratories or research institutions located in Oregon (Newport), the Olympic Coast (Port Angeles), California and Hawaii.

Operation of MOC-P involves multiple administrative, light-industrial and maritime activities. The administrative functions expected to occur are typical for a government office complex, and also include a health services center, exercise room, museum space and related amenities. Approximately 60 to 75 staff would occupy the administrative office building(s) during normal business hours (8 am to 5 pm weekdays) (Schell, 2009). A security presence (one security staff member) is on site 24-hours each day. A small contingent of contractors and grounds maintenance workers may be present on-site in separate facilities or locations throughout the property. Shop activities are typically performed within enclosed structures and may include electronics bench work and equipment maintenance, bench welding and repair of small motors or mechanical equipment, and the fabrication of specialized sensors or mechanical assemblies.

Maritime activities at MOC-P facilities occur within secure, dedicated berthing facilities with the aforementioned shops and personnel for support. The proposed MOC-P would provide a homeport for four NOAA vessels and accommodate two additional berths for other NOAA or sister research vessels. NOAA vessels range from 215 feet to 224 feet in length with a draft of less than 21 feet. Berths and navigable channels must be -24 feet Mean Lower Low Water (MLLW).

NOAA's large vessels embark on three or four cruises each year from its MOC-P facilities, typically between the months of April through September. Between October and March they are often in their MOC-P berths for minor maintenance, or at a commercial dry dock for major repairs and hull maintenance. The number of NOAA Corps officers assigned to a cruise may range from four or more per vessel, and be supported by approximately 30 wage marine crew members hired and assigned to each cruise. In addition, NOAA line offices, typically from the WRC or Montlake NWFSC in Seattle, are supported through these cruises and expeditions. Roughly five to ten research staff and any specialized equipment are brought to MOC-P for dockside loading aboard the NOAA vessel, totaling approximately 150 researchers deployed each year. Equipment for research or vessel maintenance and replacement are brought to MOC-P via various delivery methods, including 18-wheel tractor-trailer rigs. These deliveries may

occur periodically throughout the year, but more frequently from April through September with an average of three deliveries per month.

Maintenance practices include minor sanding and spot painting of interior and exterior surfaces above the water line. Hull repairs and painting are conducted during periodic dry dock servicing approximately every five years (per vessel). MOC-P implements an approved Environmental Management System (EMS) prepared for its existing facilities. These include standard work instructions focused on minimizing environmental impacts of routine ship maintenance and repairs, such as potential contamination from paint and debris.

The state of Washington typically requires ship owners to transfer vessels to dry dock locations for repair and maintenance. However, the Washington Department of Natural Resources (WDNR) reviewed the MOC-P EMS operational controls and concluded the new standards went above and beyond regulatory requirements. As a result, the state granted permission for the water-side ship repair and maintenance mentioned above.

The MOC-P EMS initiated in 2006 dramatically improved waste management, increasing occupant recycling rates and extending recycling to cover materials such as wood and metals. MOC-P transitioned to citrus-based paint solvents, which are less hazardous than conventional solvents and can be recovered and reused. Prior to EMS implementation, MOC-P generated approximately 1,800 pounds of non-acute hazardous waste annually, classifying the facility as a small quantity generator. Currently, MOC-P now generates an average of 150 pounds of non-acute hazardous waste each year and is considered a conditionally exempt small quantity generator, which further reduces the facility's operating costs.

The NOAA WRC is an ancillary NOAA facility that supports MOC-P and other Line Offices. The NOAA WRC is a large complex that provides administrative, logistical and operational functions for each of the NOAA line offices. It is located at 7600 Sand Point Way NE adjacent to Lake Washington in Seattle. This complex includes office, warehouse, outdoor storage, parking, and limited port space for line offices within its region, including auxiliary storage, parking and temporary port facilities for MOC-P and up to two MOC-P vessels. No substantive change to WRC facilities or activities is anticipated under the proposed action to award a new lease for MOC-P, regardless of the location selected.

3.6 MOC-P CLOSURE AND VESSEL DECOMMISSIONING

The proposed action may involve the closure of existing MOC-P facilities and transfer of equipment, assets and stored materials to another prospective homeport site or other location. In addition, during the course of the 20-year lease anticipated for the proposed MOC-P facilities, decommissioning and replacement of vessels home-ported at MOC-P will occur. The *Miller*

Freeman is expected to operate through Fiscal Year (FY) 2016, with charter vessel support from 2016 through 2018. NOAA Fisheries Survey Vessel 7 is proposed to come on-line at that time. The *Rainier* is expected to operate through FY 2017 after which NOAA Survey Vessel 1 is scheduled to come on-line. The *McArthur II* is scheduled to operate through FY 2021, after which NOAA Survey Vessel 3 is scheduled to come on-line.

Closure of existing MOC-P facilities (if required) would involve the removal of hazardous waste stored on- site for appropriate disposal or transfer to another storage location. Structures, piers, utilities and other lessor facilities and infrastructure may be modified and reused by another tenant, or removed and the site redeveloped for another use.

4 ALTERNATIVES ANALYSIS

The region identified by NOAA and MOC-P management for prospective MOC-P homeport sites includes the coastal Northwest, Puget Sound and Columbia River regions of Washington and Oregon. The site search area established by NOAA is shown in **Figure 1**. It illustrates NOAA's requirement for a MOC-P homeport within reasonable proximity to the fleet's primary operating areas in the Bering Sea, Gulf of Alaska, and Pacific Coastal waters; and to the NOAA WRC and the NMFS' Montlake NWFSC. WRC and Montlake NWFSC are each located in Seattle, Washington and generate approximately 80 percent of the research programs supported by OMAO from its MOC-P.

4.1 ALTERNATIVES CONSIDERED AND EVALUATED

In September 2007, NOAA initiated research for a market assessment designed to gather and analyze information on prospective homeport locations within the site search area. Potential sites were initially identified, port owners contacted, and site visits were conducted between February and June 2008. Sites evaluated during the market assessment include 22 berthing options at 17 properties.

The prospective sites were evaluated based on functional criteria and program elements established by NOAA and that meet the anticipated programmatic needs of MOC-P. In general, the site evaluation factors included:

- Physical requirements to accommodate anticipated MOC-P structures, parking, storage areas, utilities, vessel maneuverability and berth size and depth
- Quality-of-life considerations, such as proximity to affordable housing, schools, services, and recreational facilities
- Economic considerations such as order-of-magnitude construction cost and 20-year life-cycle costs for acquisition, relocation, operation and maintenance

Responses to the SFO were sought from all interested parties in a delineated area that ran from harbors of the greater Puget Sound area, including US waterside properties north to Bellingham; west to Port Angeles; south to the Columbia River, including Astoria, Oregon; along the Oregon coast to Newport, Oregon; and southeast to Portland, Oregon on the Williamette River (Barrows, 2008). Of these, offers for facilities at the following four locations were received in response to the SFO:

- 1801 Fairview Ave East, Inc., Lake Union, Seattle, Washington (existing MOC-P). This Site Alternative is hereafter referred to as Site Alternative 1 or the Lake Union site.

- Port of Port Angeles, Port Angeles, Washington (Terminal 3). This Site Alternative is hereafter referred to as Site Alternative 2 or the Port Angeles site.
- Port of Bellingham, Bellingham, Washington (Bellingham Shipping Terminal). This Site Alternative is hereafter referred to as Site Alternative 3 or the Bellingham site.
- Port of Newport, Newport, Oregon (Dock 2). This Site Alternative is hereafter referred to as Site Alternative 4 or the Newport site.

Each Site Alternative has been randomly numbered for convenience, with no implied preference based on the assigned number. The location of the four Site Alternatives in relation to the greater Pacific Northwest area is shown on **Figure 1**.

Analysis of the proposed NOAA action at each of these Site Alternatives, and for the No-Action Alternative, is provided within subsequent sections of this EA. The analysis is based on the SFO and initial offers received. Final offers subsequently received by NOAA may result in some adjustment to site layout, building design and pier configuration. Substantive changes would be further analyzed by NOAA within the NEPA process and NOAA Administrative Order 216-6.

4.2 PORTS NOT EVALUATED

Eight port entities identified in the market assessment withdrew from consideration and were not individually sent the SFO. However all potential offerors had access to the SFO through the federal business opportunities advertisement. All entities that received the SFO (except for the four listed above) did not submit an offer and were not evaluated.

4.3 NO-ACTION ALTERNATIVE

The No-Action Alternative assumes continuation of the status quo and no new comprehensive upland and in-water facilities for MOC-P. Under this scenario, the current lease for existing MOC-P facilities will eventually lapse.

Continuation of current upland operations for administrative and warehouse functions only may be extended into the foreseeable future; however, this arrangement would not maximize use of the property's waterfront attributes and is unlikely to be continued indefinitely. Temporary administrative and warehouse functions would eventually be accommodated at another unknown location or dispersed to more than one location.

All NOAA vessels typically homeported at MOC-P, including the NOAA Ship *Shimada* coming on-line in 2009, would be berthed indefinitely at temporarily arranged berths in the Pacific Northwest. Preparation for cruises and dockside vessel support would occur at various unknown ports made available to NOAA.

The No-Action Alternative is not preferred and would reduce MOC-P's overall ability to meet its mission and budget efficiently and effectively.

4.4 SITE ALTERNATIVE 1: LAKE UNION

Site Alternative 1 is located at 1801 Fairview Avenue East, Seattle, Washington, within King County, on the eastern shore of Lake Union, as shown on **Figure 2**. The site is at latitude 47.633354N and longitude 122.329202W, and is within Section 29, Township 25N, Range 4E on the U.S. Geological Survey (USGS) and National Ocean Survey (NOS) topographic-bathymetric map for Seattle North (USGS & NOS, 1983). The site is generally flat, with elevations ranging from approximately 27 feet above mean sea level (MSL) at the lake edge, to approximately 47 feet above MSL at the eastern boundary of the site.

The site is approximately 1.97 acres in size (landward of the bulkhead sheetpile wall) and includes approximately 6.35 acres of Lake Union (lakeward of the bulkhead sheetpile wall). The majority of the site (including all landward portions) is owned by 1801 Fairview Avenue East, LLC. A portion of the site (within the lake) is owned by WDNR. The site is located in an urban, mixed use setting. WRC is approximately 7.2 drivable miles from the site.

Site Alternative 1 is the existing location of the NOAA MOC-P homeport facility, however since a fire in July 2006 damaged the piers, wharf, boatshed and shop building, only land-based MOC-P activities have been undertaken at the site. Water-based activities (such as berthing of vessels) have been undertaken at temporary locations around the Seattle area since the 2006 fire. The site has been used as the MOC-P homeport facility since the 1960s. Existing site features are shown on **Figure 3**. Photographs of the site are included in **Appendix B-1**.

Lake Union is a freshwater lake, separated from Puget Sound by three drawbridges and one saltwater lock. Lake Union is not affected by oceanic tidal action, however the lake level can fluctuate daily due to runoff from snow-pack melt and precipitation. The water level of the lake is controlled by the U. S. Army Corps of Engineers (USACE) to maintain an Ordinary (average) High Water (OHW) level of 21.85 feet during summer months (May 1st to August 1st) and an Ordinary Low Water (OLW) level of 20.00 feet during winter months (December 1st to February 15th). Between these periods of OHW and OLW, the lake levels are either slowly rising (during spring) or falling (during autumn). A nautical chart of Lake Union in proximity to the site is given as **Figure 4**.

4.4.1 Site Preparation

During site preparation and construction under this Site Alternative, MOC-P administrative and warehouse operations would be relocated to a temporarily leased property within the greater

Seattle area. The lessor would be required to lease and relocate Government assets to temporary "swing" space until on-site building renovations are completed.

The existing MOC-P at this site currently consists of four main buildings, 101 parking spaces, piers and storage areas, as shown on **Figure 3**. The existing fire-damaged boat shed/storage building and shop building would be removed completely. All other existing structures on the site (the administration and warehouse/laboratory buildings, contractor and hazardous materials sheds) would remain. Government-owned property and assets would be removed to another location during the proposed site improvements. No cut and fill or major earthworks would be required.

Existing fire-damaged asphalt surface and decking on the wharf and piers would be removed. No piles would be removed, although some piles that were damaged in the 2006 fire would be cut off below the fire damage so they can be repaired (see section 4.4.3 below for details).

Asbestos-containing materials (ACM) that are not in a stable, solid matrix, or that are susceptible to damage would be properly contained and disposed of in accordance with local, state and federal regulations. Cut pilings and asphalt debris would be disposed of in accordance with any applicable regulations.

4.4.2 Proposed Upland Structures

The proposed layout of upland and pier structures is shown on **Figure 5**, as submitted by the offeror in their initial offer. While the final layout of the site may change, it is assumed that the scale and intensity of the development would be similar to that described below. The following upland development actions are proposed:

- A single-story fabricated steel structure would be constructed as the new boat shed and storage building (Building A), in the same location as the existing boat shed. The proposed building would be 4,114 gross square feet, with dimensions of 40 feet 4.5 inches by 101 feet 11 inches long. The building has a pitched roof which varies in height from 16 feet to 22 feet 9 inches.
- A single-story fabricated steel structure would be built as the new shop building (Building B) and in the same location as the existing shop building. The proposed building would be 4,119 gross square feet in area, with dimensions of 40 feet 3 inches by 101 feet 11 inches. The proposed building would have a pitched roof which varies in height from 16 feet to 22 feet 9 inches.

The following existing site features would be retained, and would be refurbished as noted:

- The existing administration building (Building C) would be seismically upgraded and new cladding, doors and windows would be installed. The existing roof would be removed and replaced with a "built up" roof. The existing footprint of Building C is 9,705 square feet, with a total floor area of 17,105 square feet (including second story). The maximum height of the refurbished building would be 23 feet 5 inches.
- The laboratory/warehouse building (Building D) would be seismically upgraded and repainted. The existing footprint of Building D is 12,000 square feet, with dimensions of 60 feet by 200 feet.
- The existing contractor shed (596 square feet) and hazardous materials shed (378 square feet) would remain, with little to no changes.
- Several laydown areas are located throughout the site, adjacent to the small boat mooring docks, Building B, hazardous materials and contractor sheds, and along the wharf.

The proposed new and refurbished structures would be LEED-NC Silver accredited. A preliminary assessment of the structures scored 33 on the LEED-NC Silver assessment. The proposed facility design has been assessed for energy performance using the ENERGY STAR rating system. The design scored an energy performance rating of 88.

4.4.3 Proposed In-Water Structures

The damaged wharf and pier structures would be repaired, which would require replacement of the existing damaged asphalt surface and decking, repair of damaged piles and installation of ten new 8.625 inch diameter steel piles, as noted below and shown on **Figure 5**. No existing piles would be removed. The layout of the pier and wharf area would be the same as the existing (pre-fire) layout.

The total area of Piers 1 and 2, the wharf pier and the small boat pier would be approximately 51,030 square feet. This would provide more than 2,400 linear feet of moorage for large ships at Piers 1 and 2, and approximately 370 linear feet of moorage at the wharf. Approximately 400 linear feet of moorage would be available at the small boat landings. Pier 1 will have a minimum separation distance from the adjacent Lake Union Drydock pier (to the south) of 208 feet.

For the purposes of this environmental assessment, a worst-case scenario for the repair and development of in-water structures has been assumed relative to NOAA requirements for pier geometry and strength. Of the 774 total existing bearing piles, it is assumed that 472 would not

require repair or additional structural work. Under a worst-case scenario, it is anticipated that 171 of the damaged bearing piles would be cut off at 2 feet below the low water line, and a new extension added. Approximately 108 of the damaged bearing piles would be cut off at 2 to 6 feet below the pile cap, and a new extension added. Similarly, 23 of the damaged bearing piles would be cut off at less than 2 feet below the pile cap and a new extension added.

Of the 179 total existing batter piles, it is assumed that 89 would require no repair or additional structural work. Approximately 48 of the damaged batter piles would be cut off at 2 feet below the low water line and a new extension added. Similarly, 42 of the damaged batter piles would be cut off at 2 to 6 feet below the pile cap and a new extension added.

Of the 254 total existing fender piles, 138 may require no repair or additional structural work and 116 would need to be repaired. It is assumed that the 10 existing small boat dock piles require no repair or additional structural work, however 10 new piles would need to be installed.

Replacement decking would match the thickness of the existing (undamaged) decking. A new asphalt surface would be installed over a waterproof membrane. The repairs would be designed to meet a live load capacity of 500 pounds per square foot. The existing (undamaged) pier structure has also been assessed to have sufficient capacity to resist seismic loads (Pacific Engineering Technologies, Inc., 2009).

A summary of conservative estimations for in-water structural elements anticipated under this site alternative is given in **Table 4.4-1** below:

Table 4.4-1: In-water structural elements at Site Alternative 1 – Lake Union

		Pier 1	Pier 2	Wharf Pier	Small Boat Dock	Total
Area (square feet)		23,800*	17,300*	9,900*	1,200*	52,200
Mooring length (linear feet)		1,200	1,200	370	400	3,170
Piles to be removed		-	-	-	-	-
Piles to be driven		-	-	-	10	10
Existing piles (no structural work)	Bearing	472 for all three piers			10	482
	Batter	89 for all three piers			-	89
	Fender	138 for all three piers			-	138
Existing piles (to be repaired)	Bearing	302 for all three piers			-	302
	Batter	90 for all three piers			-	90
	Fender	116 for all three piers			-	116

** Estimated by URS Corporation*

No dredging (initial or maintenance) is anticipated to be required to achieve and maintain adequate berthing depths at the piers and wharf.

4.4.4 Proposed Infrastructure and Services

4.4.4.1 Car Parking and Vehicle Maneuvering

Public vehicle access to the site would be obtained via existing driveways on Fairview Avenue East, where entry just north and south of the Administration Building are provided. There are three secure vehicle access points, one with a guard post and two gated entries for delivery by large trucks.

The existing 101 parking spaces on site would be provided as shown on **Figure 5**. Eighty of these spaces are secured, behind security fencing and accessed via the guard shack. The remaining 21 spaces are for general parking, and would not require access via the guard shack.

Additional, off-site public parking is located immediately adjacent to the site, between the site boundary and the formed roadway of Fairview Avenue East. These parking spaces are owned by the City of Seattle.

The security requirements of the SFO will necessitate a 20-foot setback from buildings using a physical barrier such as bollards or street furniture. This will require reconfiguration of the reserved NOAA parking along Building C, as well as existing public-owned parking along Building D.

4.4.4.2 Utilities

The property has been operating as NOAA's MOC-P homeport facility for several decades; and has adequate, water, gas, and telephone services at or adjacent to the site. Power service would be upgraded to meet increased demand from NOAA operations experienced over several years. Sewage, solid waste and stormwater infrastructure also exists at the site. Electricity and communication equipment boxes would be provided at several locations on the two piers.

4.4.4.3 Fire Protection Services

Fire extinguisher cabinets would be located within a maximum distance of 75 feet of every portion of the piers and wharf. These cabinets would contain Class 2A-20BC fire extinguishers. NOAA requires that all piers meet the applicable requirements of the NFPA 303 (Fire Protection Standard for Marinas and Boatyards) and 307 (General Principles for the Construction and Fire Protection of Marine Terminals, Piers, and Wharves).

The site is located within one mile of the closest shore-side fire station, Station #22 at 901 E Roanoke Street, Seattle. The site is located approximately three nautical miles from the nearest water-side fire station, Station #3 at 1735 W Thurman Ave, at Fisherman's Terminal in Seattle.

4.4.4.4 Fueling Infrastructure

Fueling barges are permitted to dock at the site, and fueling trucks are permitted on the piers. The nearest fueling facility for ships is located approximately three nautical miles from the site, on Salmon Bay. The nearest government fueling facility is located at Clam Bay in Puget Sound, approximately 15 nautical miles from the site.

4.4.5 Scheduling & Permitting

The lessor is required to obtain applicable permits to meet the occupancy schedule stated in their response to the SFO.

4.5 SITE ALTERNATIVE 2: PORT ANGELES

Site Alternative 2 is within the Port of Port Angeles and the adjacent Port Angeles Harbor, located north of the intersection of Marine Drive and Tumwater Street in Port Angeles, Washington, as shown on **Figure 6**. The site is located within Clallam County. The site is at latitude 48.124278N and longitude 123.447039W, and is within Section 3, Township 30N, Range 6W on the Port Angeles quadrangle topographic map (USGS, 1961).

The site consists of approximately 5.41 acres of upland area and approximately 1.7 acres of submerged land within the harbor. It is comprised of whole or portions of several individual land parcels, all of which are owned by the Port of Port Angeles. The site is located in a heavy industrial setting. WRC is approximately 80 drivable miles from the site.

Apart from a steep, rocky shoreline, the site is generally flat with an elevation of approximately 7 feet MSL. The majority of the site is currently used for automobile parking and as dry storage for boats, with a warehouse on the eastern portion. Upland and in-water portions of the site have been historically used for log storage/sorting, however this operation has been relocated further to the west within the Port. Existing site features are shown on **Figure 7**. Photographs of the site are included in **Appendix B-2**.

Port Angeles Harbor has a mean tidal range of 4.08 feet, and a spring range of 7.01 feet. The mean tide is 4.28 feet above MLLW (NOAA, 2009a). The highest observed tide was 10.27 feet above MLLW (USACE, 2009b). A nautical chart of Port Angeles Harbor in the vicinity of the site is given as **Figure 8**.

4.5.1 Site Preparation

The upland areas of the site are either compacted fill or paved with asphalt, and largely devoid of structures. The exception is a warehouse building near the northeast of the site, which would be

removed. No major earthworks or cut and fill would be required, except to create foundations for the proposed new structures.

The existing Terminal 3 pier would remain. This is a concrete structure consisting of concrete piles, pile caps and deck structure. The existing wooden trestle next to the Terminal 3 approach pier would be demolished. It is estimated that this structure contains approximately 122 wooden piles, which would be removed as part of the proposed action at this site.

4.5.2 Proposed Upland Structures

The proposed layout of upland and pier structures is shown on **Figure 9**, as submitted by the offeror in their initial offer. While the final layout of the site may change, it is assumed that the scale and intensity of the development would be similar to that described below. The following upland development actions are proposed:

- A new two-story administrative office building, providing 18,810 gross square feet for office space. The proposed building has a maximum dimension of 127 feet 9 inches by 111 feet 11 inches, and a footprint of 9,814 square feet. The maximum height of the building would be 41 feet 9 inches; however the majority of the building is either 27 feet or 33 feet 1 inch in height.
- A new 19,000 square feet building for warehouse, boat shed, electronics shop and maintenance shop purposes. The proposed warehouse building is rectangular in shape, with dimensions of 190 by 100 feet, and a pitched roof varying from 22 feet 1 inch to 31 feet 1 inch in height. This building would be adjacent to a 20,000 square feet equipment laydown area and a truck maneuvering space. An additional 10,000 square feet of outdoor storage space would be located adjacent to the laydown area.
- A single-story contractor building (500 square feet) and container storage area would be located adjacent to the warehouse building.
- A single-story 300 square feet building for hazardous materials storage would be located away from buildings and other occupied spaces. This building would be 15 by 20 feet in area, with a maximum height of approximately 12 feet.
- Tumwater Creek currently flows along the eastern boundary of the upland site, discharging to the Port Angeles Harbor west of Terminal 3. A railroad trestle bridge is present near the mouth of the creek, however this would be removed and a new concrete bridge constructed. Bridge construction would require removal and replacement of existing sheet piling. Other abandoned railway trestles currently across the creek would also be removed (referred to as “daylighting” on the proposed site plan in **Figure 9**).

Enhanced buffer zones would be provided on either side of the creek. There would be no change to the enclosed section of creek at the southeast boundary of the site.

The exterior of the buildings would consist of metal siding and pour-in-place concrete, with aluminum storefront glazing and metal composite panel features at entry points. The project would be designed to achieve LEED Silver certification at a minimum, and may achieve Gold certification. A preliminary pre-construction estimate scored 41 points on the LEED-NC project checklist. A Statement of Energy Design Intent for the proposed building indicates that the design will meet an ENERGY STAR performance rating of 75.

4.5.3 Proposed In-Water Structures

The pier at Terminal 3 would be enlarged by constructing a 1,040 feet long, 30 feet wide extension from the western end, as shown on **Figure 9**. A small-vessel float dock would be constructed at the eastern end of the southern (landward) side of the pier. Once complete, Terminal 3 would provide more than 2,300 linear feet of moorage for large vessels, and approximately 400 linear feet of moorage of small vessels.

For the purposes of this environmental assessment, a worst-case scenario for the repair and development of in-water structures has been assumed relative to NOAA requirements for pier geometry and strength. The new pier structure would consist of a concrete deck, concrete pile cap and steel pipe piles. Preliminary conceptual studies assumed the use of 18-inch diameter steel piles, with 36-inch diameter piles for the dolphins and headline dolphins. The size, number and spacing of piles has not yet been determined, however, a worst-case estimation indicates that up to 684 piles would be installed for the Terminal 3 extension, along with 12 piles for the small-boat dock. It is anticipated that bubble curtains and vibratory methods would be required to install the piles.

A summary of conservative estimations for the in-water structural elements anticipated under this site alternative is given in **Table 4.5-1** below:

Table 4.5-1: In-water structural elements at Site Alternative 2 – Port Angeles

	Terminal 3 & Trestle (existing)	Terminal 3 Extension	Existing wood trestles	Small Boat Dock	Total
Area (square feet)	40,800*	31,200	-	2,000*	32,300*
Mooring length (linear feet)	302	2080	-	400	3,182
Piles to be removed	-	-	122*	-	122
Piles to be driven (bearing)	-	522*	-	12*	534
Piles to be driven (fender)	-	150*	-	-	150
Existing piles (no structural work)	341*	-	-	-	341
Existing piles (to be repaired)	-	-	-	-	-

** Estimated by URS Corporation*

Initial dredging would be required in order to achieve the depths required for NOAA operations at the site, particularly in the vicinity of the Tumwater Creek delta. The extent and volume of the initial dredging has not yet been determined.

The area was last dredged in 1996 to provide fill material for another project. Future maintenance dredging is not anticipated to be required more than once in the next twenty years.

4.5.4 Proposed Infrastructure and Services

4.5.4.1 Car Parking and Vehicle Maneuvering

A total of 125 parking spaces would be provided on the site (refer **Figure 9**), 102 of which would be secured, and the remaining 23 would be accessible to the general public. Parking areas would be lit, landscaped and screened. Handicap-accessible parking spaces and preferred parking for fuel-efficient and low-emission vehicles would be provided, along with bicycle parking and storage areas.

Vehicle access to the site would be available from three points, with general traffic entering the site from a new driveway on Marine Drive, near the southwest of the site. Access to the pier and the warehouse/shop building would be obtained via an existing access point at the north of Tumwater Avenue (across the proposed new bridge). Alternative site access would also be available further south on Tumwater Avenue, via an existing vehicle crossing.

A large truck maneuvering area is proposed to the north of the warehouse building.

4.5.4.2 Utilities

Terminal 3 has potable water, electricity, telephone, lights and garbage services. Potable water supply would be extended along the length of the new pier. This is anticipated to consist of 2-inch line, with ten double-hose bibs spaced evenly along the pier (five on each side). The existing 600-amp, 480-volt, 3-phase power would also be extended to the end of the new pier. Sanitary sewer would also be provided on the new pier, including seven quick-connect stanchions spaced along the one side of the pier, and anticipated 4-inch lines.

Utility lines and pipes would be hung underneath the proposed pier extension.

4.5.4.3 Fire Protection Services

Fire protection services would be available on the extended pier, including seven fire standpipes evenly spaced along one side of the pier. Fire extinguishers (in cabinets) would be placed next to the standpipes. NOAA requires that all piers meet the applicable requirements of the NFPA 303 (Fire Protection Standard for Marinas and Boatyards) and 307 (General Principles for the Construction and Fire Protection of Marine Terminals, Piers, and Wharves).

The closest shore-side fire station is located at the intersection of 5th and Laurel Streets, approximately 0.9 miles from the site, with a response time of approximately three minutes. Water-side fire response is provided from this same fire station, via a response preparation area at the marina to the west of the site. Depending on the route taken by the water-side response to the site's piers, the route could be 1.6 or 3 miles in length, both with a response time of approximately 20 minutes.

4.5.4.4 Fueling Infrastructure

Fueling barges are permitted to the docks and fueling trucks may use the pier for fueling purposes. The nearest government fueling terminal is located on the Ediz Hook, approximately 1.75 nautical miles from the site.

4.5.5 Scheduling and Permitting

The lessor is required to obtain applicable permits to meet the occupancy schedule stated in their response to the SFO.

4.6 SITE ALTERNATIVE 3: BELLINGHAM

Site Alternative 3 is located within the Port of Bellingham, at 627 and 631 Cornwall Avenue in Bellingham, Washington, as shown on **Figure 10**. The site is located within Whatcom County. The site is at latitude 48.745535N and longitude 122.491915W and is within Section 36, Township 38N, Range 2E on the Bellingham South quadrangle map (USGS, 1954). The site is approximately 86 drivable miles from the WRC in Seattle.

The site comprises approximately 6.5 acres of upland area and approximately 3.58 acres of submerged lands within the harbor and adjacent to the Whatcom Waterway. The site includes portions of three separate land parcels: two of which are owned by the Port of Bellingham and the other by the WDNR, though managed by the Port of Bellingham through a Port Management Agreement. The site is located in a formerly occupied heavy industrial setting.

The site is generally flat, with an average elevation of approximately 15 feet above MLLW (Aspect, 2009). The majority of the site is currently paved, with a large warehouse structure (Warehouse One) near the northern corner, and a former maintenance shop to the southeast of the warehouse. A small section along the northeastern boundary is unpaved. The site has historically been used as a shipping terminal, and a portion of the site was used to store salt associated with the adjacent (former) Georgia-Pacific Mill facility. A small portion of the site is on the property which contained the former Georgia-Pacific Mill facility. Existing site features are shown on **Figure 11**. Photographs of the site are included in **Appendix B-3**.

Mean Low Water at Bellingham is 2.48 feet above MLLW, Mean High Water is 7.70 feet above MLLW. The highest observed tide at Bellingham Bay was 10.52 feet above MLLW (USACE, 2009a). A nautical chart of Bellingham Bay in the vicinity of the site is given as **Figure 12**.

4.6.1 Site Preparation

The existing Warehouse One and former maintenance shop buildings would be demolished. No major earthworks or cut and fill activities are required, except to create foundations for the proposed structures.

The existing shipping terminal would remain, with minor dock repairs and strengthening, as described in Section 4.6.3 below. The existing terminal consists of three distinct dock areas:

- The south dock (approximately 540 feet long) is timber framed with timber piles, bracing, stringers caps, decking and an asphalt topping.
- The central dock (approximately 330 feet long) is concrete and steel framed with steel plumb and battered piles and a new concrete bulkhead.
- The north dock (approximately 300 feet long, with a 70 feet long extension) contains creosote timber piles with steel plumb and battered piles, treated timber stringers with concrete slab over metal deck, and a timber bulkhead.

4.6.2 Proposed Upland Structures

The proposed layout of upland and pier structures is shown on **Figure 13**, as submitted by the offeror in their initial offer. While the final layout of the site may change, it is assumed that the scale and intensity of the development will be similar to that described below. Proposed upland developments include construction of a new building on the site. The proposed building is roughly "L-shaped," with maximum dimensions of approximately 246 by 163 feet (as estimated from drawings). The height of the proposed building is not specified at this time.

The southeast "leg" of the building would be single-story, and contain 10,275 gross square feet of warehouse space and a 2,800 square feet boat shed. The northwest leg of the building would be two-story, with 8,600 square feet of electrical and maintenance repair shops on the ground floor, and 17,100 square feet of office space split between the ground and second floors (at the northernmost end of the building).

A building design has not yet been initiated, however a conceptual design suggests the building would be constructed of precast concrete, bricks and blocks, metal panels and glass.

In addition to the main building, the following other facilities would be provided on the site:

- A single-story 500 square feet contractor building to the west of the main building (adjacent to the terminal).
- 30,000 square feet of outdoor storage and laydown space at the southeast of the site.
- A single-story 450 square feet hazardous material storage building at the very southern extremity of the site, well away from other buildings and structures.

The proposed main building would be LEED Silver certified, obtaining a Pre-Certification Estimate score of 38 points on the Registered Project Checklist. The projected energy performance using the USEPA ENERGYSTAR Target Finder suggests an energy reduction of 60 percent and a CO_2e Emissions Reduction of 102 metric tons per year.

4.6.3 Proposed In-Water Structures

The proposed site includes Berths 1 and 2 located along the northwest face of the existing shipping terminal and the Whatcom Waterway, as shown on **Figure 13**. Berth 3 on the southeast face of the terminal is not part of the proposed site, and will be separated by security fencing. The northwest face of the terminal is 1,270 feet in length. To obtain an additional 290 linear feet of mooring length required by NOAA (1,560 linear feet total), mooring dolphins and catwalks would be constructed at each end of the existing terminal (one dolphin approximately 75 feet from the existing southwest end, and two dolphins at approximately 100 and 225 feet, respectively, from the northeast end. A float dock with wave barrier system would be installed to provide 400 linear feet of small-boat moorages southeast of the proposed northeast dolphin (within a former log pond).

For the purposes of this environmental assessment, a worst-case scenario for the repair and development of in-water structures has been assumed relative to NOAA requirements for pier geometry and strength. The existing terminal structure would be seismically upgraded to meet NOAA's requirements. Localized repairs and corrosion protection may also be undertaken in some areas. The timber bulkhead abutting the proposed new building would be replaced with a new steel sheet pile bulkhead, construction of which is likely to involve the use of a vibratory hammer, compressor and crane.

A summary of conservative estimations for the in-water structural elements anticipated under this site alternative is given in **Table 4.6-1** below:

Table 4.6-1: In-water structural elements at Site Alternative 3 – Bellingham

	Existing Terminal	SE Mooring Dolphin	NW Berthing Dolphins	Small Boat Dock	Wave Attenuator	Total
Area (square feet)	12,700	400	800	1,020	9,000	23,920
Mooring length (linear feet)	1,270	0*	290*	400	-	1,960
Piles to be removed	-	-	22*	-	-	22
Piles to be driven	-	12*	24*	4*	14*	54
Existing piles (to remain)	1050*	-	-	-	-	-

** Estimated by URS Corporation*

There has been no dredging at the site within the last three years, however dredging by USACE of the Whatcom Waterway Federal Channel has occurred prior to that time to allow deep-draft vessels to serve the former Georgia-Pacific Mill.

No dredging is necessary to achieve the water depths required by NOAA. Future dredging of Whatcom Waterway is proposed as part of a separate environmental cleanup project (not part of this proposed action), and is likely to occur between 2010 and 2011. Dredging of the section of the waterway abutting this site alternative would be completed prior to occupancy by NOAA.

4.6.4 Proposed Infrastructure and Services

4.6.4.1 Car Parking and Vehicle Maneuvering

The site design includes 150 parking spaces to the southeast of the main building. Of the 150 total parking spaces, 100 would be fully secured, while 50 would be for general/visitor parking (but still require passing through the security checkpoint). A bicycle parking/storage area is also provided.

Truck access and truck maneuvering areas would be present along the southwest boundary of the site, between the laydown area at the southeast of the site and the contractor building near the dock.

4.6.4.2 Utilities

No information regarding proposed utilities is provided within the offer.

4.6.4.3 Fire Protection Services

Fire protection on the existing docks is unknown. NOAA requires that all piers meet the applicable requirements of the NFPA 303 (Fire Protection Standard for Marinas and Boatyards) and 307 (General Principles for the Construction and Fire Protection of Marine Terminals, Piers, and Wharves).

The closest landside station is Fire Station #3 on Indian Street, approximately 0.9 miles from the site, with a response time of less than four minutes. There is a 16 minute waterside response time.

4.6.4.4 Fueling Infrastructure

The site is approximately 1.75 nautical miles from the nearest fuel depot at Fairhaven, and is approximately 103 nautical miles from the nearest government fueling facility, the Manchester Navy Fuel Depot.

4.6.5 Scheduling and Permitting

The lessor is required to obtain applicable permits to meet the occupancy schedule stated in their response to the SFO.

4.7 SITE ALTERNATIVE 4: NEWPORT

Site Alternative 4 is within the Port of Newport and Yaquina Bay, as shown on **Figure 14**, located at 2000 OSU Drive in Newport, Oregon, Lincoln County. The site is at latitude 44.625236N and longitude 124.047318W and is within Section 8, Township 11S, Range 11W on the Newport South and Newport North quadrangle topographic maps (USGS, 1984a and 1984b). The site is approximately 300 drivable miles from the WRC in Seattle.

The site comprises approximately 5 acres of upland area and approximately 1.2 acres of Yaquina Bay. The site is owned by the Port of Newport. The site is located in a setting of water-dependent and water-related activities, including marine research and educational facilities.

The site is generally flat, although the northern portion of the site is terraced approximately six feet lower than the southern portion, ranging from 14 to 20 feet above MSL (Port of Newport, 1980). The site contains a former pumping station, several container storage units, two docks, and a former fish farming complex with abandoned fish ladders, flumes and ponds, as shown on **Figure 15**. The southwestern portion of the site, along with adjacent land to the south, is currently lease to and used by Yaquina Bay Fruit Processors. The northern portion of the site (including the westernmost dock) is currently leased to and used by Carvahlo Fishing for fish buying operations. Prior to the mid-1980s, the site was used as a salmon farming operation. The site is located adjacent to Oregon State University's (OSU) Hatfield Marine Science Center, which operates a dock to the east of the site for its research vessel. Photographs of the site are included in **Appendix B-4**.

Yaquina Bay has a mixed semi-diurnal tide, with a mean tidal range of 6.37 feet above MLLW and a spring tidal range of 8.34 feet above MLLW at South Beach. The mean tide level at South

Beach is 4.51 feet above MLLW (NOAA, 2009a). A nautical chart of Yaquina Bay in the vicinity of the site is given as **Figure 16**.

4.7.1 Site Preparation

The existing pumphouse building and all structures associated with the former fish farming operation on the proposed NOAA site would be demolished. The existing generator within the pumphouse would be salvaged prior to demolition, for use by NOAA as a backup generator.

The site would be leveled to an estimated elevation of around 17 feet, with the fish ponds and other existing site features removed. Initial estimates of cut and fill volumes for the site are balanced.

The two existing piers and four existing dolphins would be removed. This would most likely be undertaken using a vibratory extraction method. A total of 194 piles would be removed, three of which are steel H-beams, and the remainder wooden. Initial estimates by the offeror suggest that the docks and dolphins can be removed within a 7-day working period. This estimate is based on a removal rate of 30 piles per day, which they consider to be a conservative assumption.

4.7.2 Proposed Upland Structures

The proposed layout of upland and pier structures is shown on **Figure 17**, as submitted by the offeror in their initial offer and subsequent information provided to NOAA (Mann, 2009). While the final layout of the site may change, it is assumed that the scale and intensity of the development will be similar to that described below. The following upland development actions are proposed:

- A two-story office building, of approximately 132 by 65 feet, located in the northeast corner of the site (approximately 17,360 gross square feet).
- A large warehouse/shops building of approximately 177 feet 4 inches by 116 feet 8 inches (approximately 20,700 gross square feet) located in the southwest portion of the site. This building would contain the machine, wood and electronic shop and warehouse areas.
- A boat storage building, of approximately 48 by 48 feet (2,850 gross square feet), located to the northwest of the warehouse.
- A contractor building of 25 by 20 feet (500 gross square feet), located at the north of the site, just west of the new pier.
- A hazardous materials building of 17 feet 4 inches by 17 feet 4 inches (300 gross square feet), located on the southern boundary of the site (to the southeast of the warehouse).

The primary buildings on site would be designed with the intent of achieving an ENERGY STAR rating of 75 or more within 18 months of reaching occupancy, and thereafter. Information provided to NOAA by the offeror indicated a pre-certification LEED-NC assessment estimate of 36 points, as well as an assurance that the final design would meet the LEED-NC Silver threshold with a minimum of 33 points.

4.7.3 Proposed In-Water Structures

A new pier for NOAA use is to be constructed to the west of where the existing piers are currently situated, as shown on **Figure 17**. This figure shows the proposed layout as submitted by the offeror in their initial offer. While the final layout of the proposed piers may change, it is assumed that the scale and intensity of the development will be similar to that described below. The new pier structure would consist of an approach pier (perpendicular to the shore) of approximately 260 feet, with a berthing wharf (roughly parallel to the shore) extending in each direction from the approach pier. The berthing wharf would extend 260 feet to the southeast, leaving approximately 200 feet of clear space between the new NOAA pier and the adjacent OSU dock. The berthing wharf would extend approximately 1,040 feet to the northwest, and have a slight bend in it to follow the shoreline. The approach pier and berthing wharf would be approximately 30 feet in width. The new pier would provide for at least 1,560 usable linear feet of mooring space for large ships (five berthing spots on the northern (bay-side) side of the pier, and one berthing spot on the southern (shore-side) side of the pier to the east of the approach pier. A floating dock for small vessel mooring (10 feet wide by 225 feet in length) would be provided to the south (shore-side) of the northwestern berthing wharf.

Preliminary conceptual design undertaken by the offeror (based on data extrapolated from the recent construction of the adjacent OSU dock) estimated that the new pier would require the following piles:

- 70 vertical pier piles (60 edge, 10 middle), which are 18 inch diameter, 0.375 inch ASTM 500, filled with concrete to approximately 15 feet below the mudline.
- 210 batter pier piles (60 edge, 150 middle), of same construction as the vertical pier piles.
- 240 vertical fender piles, which are 12.75 inch diameter, 0.5 inch wall.
- 22 vertical small boat mooring piles 16 or 18 inches in diameter, 0.375 inch ASTM 500.

It is anticipated that vibratory methods would be used to drive the new piles, although jetting could be used, if allowed by the relevant agencies. The adjacent OSU dock to the east, which was recently constructed, used a jetting method (Dale, 2009b). It is estimated that approximately

eight piles could be driven in a working day, which gives a total in-water construction period of around 68 days for the above pile estimates.

For the purposes of this environmental assessment, a worst-case scenario for the repair and development of in-water structures has been assumed relative to NOAA requirements for pier geometry and strength. A pier design assuming pile bent spacing of between 12 and 20 feet is considered to be the worst-case scenario.

A summary of conservative estimations for the in-water structural elements anticipated under this site alternative is given in **Table 4.7-1** below:

Table 4.7-1: In-water structural elements at Site Alternative 4 – Newport

		Existing Port Dock 2	Existing Intake Pier	Existing Dolphins	New Pier	Small Boat Dock	Total
Area (square feet)		-	-	-	39,000	2,250	41,250
Mooring length (linear feet)		-	-	-	1,540	450	1,990
Piles to be removed		117 wooden	10 wooden 3 steel H-beam	64 wooden	-	-	194
Piles to be driven	Vertical	-	-	-	210*	22	232
	Batter	-	-	-	630*	-	630
	Fender	-	-	-	240	-	240
Existing piles (to remain)		0	0	0	-	-	0

** Estimated by URS Corporation*

It is anticipated that approximately 42,000 cubic yards would need to be dredged from the proposed pier site to provide sufficient water depth to accommodate NOAA vessels (Dale, 2009a). This is considered a conservative (worst case) estimate. It is anticipated that maintenance dredging would not be required more often than every ten years.

4.7.4 Proposed Infrastructure and Services

4.7.4.1 Car Parking and Vehicle Maneuvering

Site access is proposed via OSU Drive, to the south of the existing access to the site.

A total of 126 parking spaces would be provided on site, 25 would be visitor parking spaces located to the south of the proposed office building. Of the remaining 101 spaces, 5 would be located near the proposed contractors' building and pier, 63 between the proposed office building and boat shed, and 33 to the east of the proposed warehouse building. All of these 101 spaces would be within a secure area.

The proposed site layout includes ample maneuvering spaces for large trucks, located to the east of the proposed warehouse building.

4.7.4.2 Utilities

The site currently has overheard 3-phase electricity, provided by Central Lincoln Peoples' Utility District, along the western boundary of OSU Drive. This would need to be upgraded to meet NOAA requirements, from a service source located approximately 1500 feet to the south. The proposed service extension is likely to be placed underground, rather than overhead.

Existing underground telephone, gas and sewer utilities are located along a similar corridor to the existing overheard power lines.

The 365-kilowatt diesel generator that is currently located within the existing pumphouse (which would be demolished), is to be retained and used as a backup generator for the NOAA operations.

4.7.4.3 Fire Protection Services

A 14-inch diameter fire main is present along OSU Drive. NOAA requires that all piers meet the applicable requirements of the NFPA 303 (Fire Protection Standard for Marinas and Boatyards) and 307 (General Principles for the Construction and Fire Protection of Marine Terminals, Piers, and Wharves).

The two closest land-based fire stations are each approximately 2.5 miles from the site, with an average response time of approximately 5.5 minutes. The U.S. Coast Guard is located approximately 1,200 feet across Yaquina Bay from the site, and has capability to pump water for fire suppression.

4.7.4.4 Fueling Infrastructure

Fueling barges are permitted to enter Yaquina Bay to service ships, and would be able to access the proposed pier. Fueling trucks would be permitted to use the pier for fueling purposes. Small vessels would be able to refuel at one of two nearby terminals; one at the marina to the southwest of the site, and the other across Yaquina Bay.

The nearest commercial fueling terminal is located at McCall in Portland, Oregon, and the nearest government fueling terminal is located at Manchester in Port Orchard, Washington. These facilities are located approximately 182 and 328 nautical miles from the site, respectively.

4.7.5 Scheduling and Permitting

The lessor is required to obtain applicable permits to meet the occupancy schedule stated in their response to the SFO.

5 ENVIRONMENTAL ASSESSMENT

This section of the document discusses the existing environment for key resource topics and evaluates anticipated environmental impacts to those resources, including recommended impact mitigation measures, for the proposed action under each action alternative and the No-Action Alternative. The offeror who is awarded the lease (the lessor) will be responsible for securing all building and other local, state and federal permits for both the buildings and piers covering construction of the improvements, and implementation of applicable mitigation measures. Any applicable mitigation measures will be achieved through a combination of compliance with local, state and federal permit requirements and the requirements of the SFO. Local, state, and federal agencies may independently require compliance with the mitigation measures mentioned in the EA or alternative mitigation measures.

5.1 LAND USE

Land use controls in the state of Washington include the Growth Management Act of 1990, the Shoreline Management Act (SMA) of 1972, and the State Environmental Policy Act (SEPA) of 1971. The Growth Management Act requires state and local governments to manage growth by identifying and protecting critical areas and natural resource lands, designating urban growth areas, preparing comprehensive plans, and implementing these plans through capital investments and development regulations, including local zoning codes (Revised Code of Washington [RCW] 36.70A.060). The SMA is intended "to prevent the inherent harm in an uncoordinated and piecemeal development of the state's shorelines" (RCW 90.58). SEPA provides the framework for agencies to consider the environmental consequences of a proposal before taking action, and gives agencies the ability to condition or deny a proposal due to identified likely significant adverse impacts (RCW 43.21C).

Land use controls in the state of Oregon include: Oregon Revised Statute (ORS) 196 - *Columbia River Gorge, Ocean Resource Planning, Wetlands, Removal and Fill*; ORS 197 - *Comprehensive Land Use Planning Coordination*; and ORS 227 - *City Planning and Zoning*. The Estuary Management Plan for Lincoln County, Oregon includes the Salmon River, Siletz Bay, Alsea Bay, and Yaquina Bay (Lincoln County, 1982). The Estuary Management Plan represents the overall management scheme for the resources of the estuaries to reflect local interests and incorporate the concerns of affected state and federal agencies.

Land use impact is based upon existing NEPA significance thresholds associated with relative intensity and duration. A negligible impact would result from a barely perceptible and non-measurable change in land use. A minor impact would be a detectible change, but would be compatible with surrounding land uses. Development resulting in substantial, noticeable effects

on the surrounding community would be a moderate impact. Any development that is not compatible with surrounding land uses would be considered a major impact. The duration of effects for operation and maintenance of MOC-P under each Site Alternative is over an anticipated 20-year project life.

5.1.1 No-Action Alternative

5.1.1.1 Existing Environment

The No-Action Alternative assumes continuation of upland activities at the existing MOC-P site on Lake Union, and continuation of water-based activities (ship berthing, etc) at various temporary locations around Lake Union and the Seattle area, as described in Section 4.3 above. The existing environment of the Lake Union area in relation to land use is described more fully in Section 5.1.2.1 below.

Continued use of the site as the MOC-P homeport facility is in accordance with the City of Seattle Land Use Code (Seattle Municipal Code [SMC] Title 23) and the City of Seattle Shoreline Master Program (SMP). See Sections 5.2.1 and 5.10.1 for critical areas information, including geologic hazards and floodplains.

5.1.1.2 Environmental Consequences

Since a fire in July 2006 damaged the piers, wharf, boatshed and shop building, only land-based activities have occurred. Water-based activities, including the berthing of vessels, would continue to be temporarily located throughout the Seattle area until the lease elapses. Use of the site for a government facility would continue to be in conformance with local zoning regulations. No changes to the existing land use would result. The land use impact would be negligible.

5.1.1.3 Mitigation Measures

No mitigation measures are recommended for the No-Action Alternative in relation to land use.

5.1.2 Site Alternative 1: Lake Union

5.1.2.1 Existing Environment

The MOC-P homeport facility has been located at Lake Union since the 1960s. The site is zoned by the City of Seattle Department of Planning and Development as Industrial General 1 Unlimited/45 within the Eastlake (Residential Urban Village) overlay zone. The shoreline designation is Urban Maritime (SMC Chapter 23.60). The purpose of the Industrial General 1 Unlimited/45 zone is to protect marine and rail-related industrial areas from an inappropriate level of unrelated retail and commercial uses by limiting these uses to a density or size limit

lower than that allowed for industrial uses. Typical uses include general and heavy manufacturing, commercial uses, institutional uses, entertainment, transportation, and utility services. There is a 45-foot height limit for this site.

Adjacent land uses include light industrial, medical/dental, office, residential (condominiums, apartments, and houseboats), parks, restaurants, retail, and parking, as shown in **Appendix C-1**. Immediately surrounding the site, there is a private dock to the south; retail and offices to the east; houseboats to the north; and Lake Union to the west. Use of the site as the MOC-P homeport facility is in accordance with the City of Seattle Land Use Code (SMC Title 23) and the City of Seattle SMP. See Sections 5.2.1 and 5.10.1 for critical areas information, including geologic hazards and floodplains.

5.1.2.2 Environmental Consequences

The proposed action at Site Alternative 1 would include repair of the fire damaged Pier 1, Pier 2, and Wharf Pier, as well as construction of new buildings to replace the fire damaged boatshed and storage building and shop building (Buildings A and B). Necessary building permits for the pier repairs were granted by the City of Seattle Department of Planning and Development in 2008. In addition, the administration building and warehouse/laboratory building (Buildings C and D) would be renovated and retrofitted to meet fire, life and safety codes and to achieve LEED-NC Silver status. No changes to the existing land use would result. The land use impact would be negligible.

5.1.2.3 Mitigation Measures

No mitigation measures are recommended for Site Alternative 1 in relation to land use.

5.1.3 Site Alternative 2: Port Angeles

5.1.3.1 Existing Environment

This site is currently in use as a parking lot and storage area for boats, with a warehouse structure near the eastern boundary. The site has primarily been used as a shipping terminal and log rafting and handling facility until very recently. The site is zoned by the City of Port Angeles Community and Economic Development Department as Industrial Heavy. Permitted uses include warehousing, storage yards, ship building and repair, marinas, manufacturing, utilities, and freight terminals. The current shoreline designation is Urban-Harbor (Makers, 1993). The purpose of the Urban-Harbor shoreline designation is to provide for intensive public and commercial activities while managing development to enhance and maintain shorelines for a multiplicity of urban uses. Areas designated Urban-Harbor within the City of Port Angeles

includes intensive land and shoreline use including industrial, commercial and recreational activity; and intensive port activity.

Located within a water-oriented industrial area, adjacent land uses include the Port of Port Angeles, yacht building, ship repair and retrofitting, marina, and a mix of industrial and residential, as shown in **Appendix C-2**. Immediately surrounding the site are shipyards to the south; the Port of Port Angeles to the east; Ediz Hook to the north; and a marina to the west. See Sections 5.2.3 and 5.10.3 for critical areas information, including geologic hazards and floodplains.

5.1.3.2 Environmental Consequences

Use of the site as the MOC-P homeport facility would be in accordance with the City of Port Angeles Municipal Code (Title 17 - Zoning) and the City of Port Angeles SMP Update. This is expected to be a permitted use within the Industrial Heavy designation and is subject to a Building Permit, Sign Permit, and Environmental Checklist (under SEPA).

The proposed action at Site Alternative 2 would include demolition and/or removal of the existing structures on upland portions of the site, and removal of an existing wooden trestle from the nearshore. The existing Terminal 3 would be retained and would also be extended. New structures to support MOC-P administrative, warehouse and shop activities would be constructed on upland portions of the site. The proposed land use would be compatible with existing surrounding uses. The land use impact would be negligible.

5.1.3.3 Mitigation Measures

No mitigation measures are recommended for Site Alternative 2 in relation to land use.

5.1.4 Site Alternative 3: Bellingham

5.1.4.1 Existing Environment

Upland portions of this site are entirely paved with a large warehouse, a former maintenance shop building and several small shipping containers. The warehouse building is currently unoccupied, while the former maintenance shop and shipping containers are used for storage by the Port of Bellingham or its tenants. The berths along the wharf portion of the site are currently in use by the Port of Bellingham or its tenants. The subject site has been used as a dock and shipping terminal since the 1930s. The site is zoned by the City of Bellingham as Industrial/Waterfront Mixed Use. Permitted uses within this zone include manufacturing, retail trade, transportation, public facilities, and marinas. The current shoreline designation is Urban Maritime (City of Bellingham, 1989).

Located within a water-oriented industrial area, land uses adjacent to the site include the Port of Bellingham, energy facilities, warehouses/storage, and transportation (railroad tracks and rail car storage), as shown in **Appendix C-3**. Immediately surrounding the site is the Port of Bellingham to the south; a large vacant, paved lot to the east; the Whatcom Waterway to the north; and docks and Bellingham Bay to the west. See Section 5.2.4 and 5.10.4 for critical areas information, including geologic hazards and floodplains.

5.1.4.2 Environmental Consequences

Use of the site as the MOC-P homeport facility would be in accordance with the City of Bellingham Municipal Code (Title 20 - Land Use Development) and the City of Bellingham SMP. The project would be subject to a Building Permit, Sign Permit, Temporary Certificate of Transportation Concurrency, Shoreline Permit, Critical Areas Permit, and Environmental Checklist (under SEPA).

The proposed action at Site Alternative 3 would involve demolition of the existing warehouse and other upland structures. The existing shipping terminal would be retained and undergo minor repairs, and would also be extended through the addition of dolphins, a wave attenuator and small boat dock, which would involve development within state waters. New structures to support MOC-P administrative, warehouse and shop activities would be constructed on upland portions of the site. The proposed upland activities would be compatible with existing surrounding uses. Overall, the land use impact would be negligible.

5.1.4.3 Mitigation Measures

No mitigation measures are recommended for Site Alternative 3 in relation to land use.

5.1.5 Site Alternative 4: Newport

5.1.5.1 Existing Environment

The site contains a former pumping station, several container storage units, two docks, and a former fish farming complex. The southwestern portion of the site is currently used by Yaquina Bay Fruit Processors, along with adjacent land to the south of the site. The northern portion of the site (including the westernmost dock) is currently used by Carvahlo Fishing, as a fish buying operation. Prior to the mid-1980s, the site was used as a salmon farming operation.

The site is zoned by the City of Newport as Water-Dependent and Water-Related. Permitted uses within these zones include docks, wharves, piers, port facilities, terminal facilities for loading and unloading ships and barges, and marine research and education facilities. The site abuts the portion of Yaquina Bay that is designated as Estuary Management Unit No. 7 (Lincoln

County, 1982). This management unit contains a development classification allowing for the development of in-water facilities to serve marine-based uses, including wharfs.

Land uses adjacent to the site include research, education, offices, and manufacturing as shown in **Appendix C-4**. Immediately surrounding the site is a marina to the south; the Hatfield Marine Science Center to the east; Yaquina Bay to the north; and a vacant lot to the west. See Sections 5.2.5 and 5.10.5 for critical areas information, including geologic hazards and floodplains.

5.1.5.2 Environmental Consequences

Use of the site as the MOC-P homeport facility would be considered a permitted use by the City of Newport Zoning Ordinance (Newport Zoning Ordinance No. 1308 [as amended]) and the Lincoln County Estuary Management Plan. The project would be subject to a Building Permit and an Estuarine Use Permit.

The proposed action at Site Alternative 4 would involve removal or demolition of the existing structures on the site (including the existing docks), and leveling of the site. A new pier would be installed within the nearshore area, and five new buildings and associated facilities to support MOC-P administrative, warehouse and shop activities would be constructed on upland portions of the site. The proposed land use would be compatible with existing surrounding uses. The land use impact would be negligible.

5.1.5.3 Mitigation Measures

No mitigation measures are recommended for Site Alternative 4 in relation to land use.

5.2 GEOLOGICAL RESOURCES

Project-related impacts associated with geological resources include hazards such as landslides, erosion, fault rupture, seismic shaking, liquefaction, tsunamis, and effects to mineral resources. Geologically hazardous areas pose a threat to the health and safety of citizens when incompatible industrial, commercial, or residential development is sited in areas of significant hazard. Some geological hazards can be reduced or mitigated by engineering, design, or modified construction practices so that risks to health and safety are acceptable. When technology cannot reduce risks to acceptable level, building in geologically hazardous areas is best avoided. Geological hazards considered at each site are defined as follows:

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 as a result of ground shaking, ground rupture, soil liquefaction, or tsunamis. Earthquakes are driven by geological processes which produce stresses in the earth's crust (plate tectonics). 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 (CSZ), lies approximately 50 miles offshore and extends from the middle of Vancouver Island in British Columbia past Washington and Oregon to northern California. Seismic hazards can include the following:

- The most damaging effect of an earthquake is strong shaking at the ground surface. It has been observed for years 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 (UBC) and are referred to as National Earthquake Hazard Reduction Program site classes.
- 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.
- 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 (Palmer, 2004b).
- 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.

5.2.1 No-Action Alternative

5.2.1.1 Existing Environment

The No-Action Alternative assumes continuation of upland activities at the existing MOC-P site on Lake Union, and continuation of water-based activities (ship berthing, etc.) at various temporary locations around Lake Union and the Seattle area, as described in Section 4.3 above. The existing geological environment of the Lake Union area is described more fully in Section 5.2.2.1 below.

5.2.1.2 Environmental Consequences

There would be no change to the existing site conditions and no proposed construction under the No-Action Alternative. Therefore, the No-Action Alternative would have no impacts on geological resources, and would result in no changes to the potential effects of landslide, erosion or seismic hazards.

5.2.1.3 Mitigation Measures

No mitigation measures related to geological resources are recommended for the No-Action Alternative.

5.2.2 Site Alternative 1: Lake Union

5.2.2.1 Existing Environment

The proposed action at Site Alternative 1 includes land located at the eastern shoreline of Lake Union. Elevations at the site area range from 27 feet above mean sea level (MSL) at the lake edge, to approximately 47 feet above MSL at the eastern boundary of the site. Approximately 1,000 feet to the east, elevations rise to more than 400 feet.

The site is within western Washington, within the Puget Sound Lowland, an elongate structural and topographic basin bordered by the Cascade and Olympic Mountains. The Puget Sound has been glaciated at least seven times during the Quaternary Period by glaciers coalescing from British Columbia. The geology of the area is therefore dominated by a complex, alternating, and incomplete sequence of glacial and interglacial deposits that rest upon an irregular bedrock surface. The depth to bedrock varies from zero to several miles below the ground surface.

The bedrock and overlying Quaternary sediments in the Puget Lowland have been deformed by faults and folds because of its proximity to the CSZ. Earthquakes and volcanoes are triggered

and generated by northeastward subduction of the Juan de Fuca plate beneath North America. The Puget Sound Lowland is also undergoing north-south compression and shortening by internal deformation and thrust faulting. The Seattle fault, approximately two miles south of the site, is one of several active structures beneath the Puget Lowland. It is the closest fault system and it forms the border between the Seattle Basin and the Seattle Uplift. The east-west Seattle fault zone passes through Seattle along the I-90 highway corridor. Evidence suggests that at least three significant events have occurred along this fault in the last 15,000 years (Geological Society of America, 2003; Troost & Booth, 2004).

The modern landscape is largely a result of repeated cycles of glacial scouring and deposition, and recent processes such as landsliding and river action. Puget Sound is currently a bay with numerous channels and branches which constitute a fjord system of flooded glacial valleys. The north-south ridges of the lowland are the result of glacial scouring and subglacial stream erosion.

According to various geologic maps for the area, (Troost, *et al*, 2005; Pacific Northwest Center for Geologic Mapping Studies, 2006; and Geologic Society of America, 2003), materials in the vicinity of the site include non-glacial (artificial fill and lake deposits), and glacial-interglacial deposits:

- Artificial fill consists of gravel, sand, silt, concrete, garbage, slag, and other materials, placed as a direct result of human activity and with an average thickness over six feet at the site. These materials are very soft to stiff or very loose to dense, and the grain size is unpredictable. Underlying lake deposits include silt and clay with local sand layers, peat, and other organic sediments, deposited in slow-flowing water. Thicknesses of these deposits at the lake shoreline at or near the site typically range between three to nine feet.

- Glacial and interglacial deposits at or near the site include a series of complex, alternating, and incomplete sequence of deposits that rest upon an irregular bedrock surface. The Vashon stade of the Frasier glaciation is the most recent glaciation (from about 13,500 to 15,000 years ago). Deposits in the site vicinity associated with Vashon glaciation include Vashon recessional and landslide deposits (silt and clay, with local sand layers, peat, and other organic sediments, deposited in slow-flowing water and ephemeral lakes), and the Vashon drift which includes the Lawton Clay, the Vashon advance outwash deposits (mainly well sorted sand and gravel deposited by streams issuing from advancing ice sheet) and the Vashon subglacial till. The Vashon till is probably the most prevalent material in the vicinity of the site and consists of silt, sand and gravel, glacially transported and deposited under ice, and it displays wide variations in thickness from zero to several hundred feet .

According to several previous explorations at the site (GeoEngineers, 2005 and 2009) to depths ranging between 15 to 27 feet below ground surface (bgs), materials underlying the site include fill material, native soils, and glacial till. Fill material ranges in thickness from 8 to 22 feet bgs. The fill material is variously underlain by undifferentiated fill and native soil consisting of fine-grained silt and sand glacial and non-glacial soils, and by glacial till consisting of dense silty sands and gravels.

The area has been mapped as a Site Class B to C in the Site Class Map of King County, Washington for Ground Shaking Classification Areas (Washington Division of Geology and Earth Resources [WDGER], 2004a).

Groundwater was measured at depths ranging from 6.5 to 8.5 feet in bgs in several monitoring wells at or near the site during several groundwater sampling events between 1998 and 2009. Groundwater flow was estimated to be toward south-southwest beneath upland east of the site (GeoEngineers, 2009).

According to the Minerals Yearbook for the state of Washington (USGS, 2005A), mineral producing areas for clay, construction sand and gravel and industrial sand exist in King County, along with cement, gypsum and steel plants. However it appears that there are no substantial mineral resources or existing mineral resource recovery operations on or near the site.

5.2.2.2 Environmental Consequences

a) Landslide Hazard

The bluffs and terraces along present and historic shorelines of Lake Union are mantled with colluvium, which tends to slide during or following periods of heavy precipitation. Groundwater seeps out of the steep slopes at contacts between permeable and relatively impermeable geologic units, further contributing to landslide potential around the Puget Sound Lowland. However, given that the site is essentially flat, and the nearest terrace is more than 1,000 feet from the site, it is considered that slope instability is unlikely to affect future site development at the site.

b) Erosion Hazards

The site is in an urban environment where the erosion hazard is considered relatively low; however, certain soil types at the site may be susceptible to erosion when disturbed by construction, particularly if slopes are constructed which exceed 15 percent grade.

c) Seismic Hazards

Geologic evidence suggests that most of Washington is at risk from large earthquakes. Western Washington is a seismically active area and has a history of relatively large earthquakes. Seismic

hazards in the site vicinity are mainly related to the Seattle Fault Zone located at approximately two miles to the south. Although, this fault zone has no historic activity (no large earthquakes during the last 100 years), the region as a whole has experienced many historic earthquakes causing ground failures throughout the Puget Sound.

i Groundshaking / Ground Motion Amplification

The site lies within a seismically active area, and moderate levels of ground shaking should be anticipated during the design life of the facility project. Consequently, the near-surface soils at the site could affect the level of earthquake ground shaking felt in the area.

The presence at the site of Site Class B and C soils (WDGER, 2004a) represents a soft rock condition, where earthquake shaking is neither amplified nor reduced by the near-surface geology (Site Class B) to softer soil conditions which result in a low increased amplification of ground shaking (Site Class C). The site class map is meant only as a general guide to delineate areas based on their potential for enhanced ground shaking. The data used in the site class map is based on regional geologic mapping, and therefore, cannot be used to make a final determination at any specific locality. This determination requires a site-specific geotechnical evaluation performed by a qualified professional.

ii Ground Rupture

No major faults exist at or at the immediate vicinity of the site. Although the Seattle Fault Zone is located south of the site, due to the distance between the site and these fault zones, it is unlikely that ground rupture would occur at the site. Accordingly, design against actual ground surface rupture at the site during a seismic event would not be a significant part of the site-specific seismic design for future site improvements.

iii Liquefaction

Much of the artificial filling was accomplished hydraulically from about 1890 to 1930, when the landscape of the site area reached is current form. As a result, the site lies on loose, saturated soil deposits, both natural and man-made, that make this area susceptible to liquefaction. Additionally, the area has been mapped as a site of High Liquefaction Susceptibility in the Site Class Map of King County (WDGER, 2004b).

The liquefaction susceptibility map is meant only as a general guide to delineate areas prone to liquefaction. The data used in the liquefaction susceptibility map is based on regional geologic mapping, and therefore, cannot be used to make a final determination at any specific locality. This determination requires a site-specific evaluation performed by a qualified geotechnical professional.

iv Tsunamis

Although the pacific coast of Washington is at risk from tsunamis due to the proximity of the CSZ, it is considered that the potential tsunami inundation hazard at the Site is negligible due to the intricate system of channels and branches, including locks on the Washington Shipping Canal, located between the site and the open Pacific Ocean. Additionally, the site is not included in any of the inundation zones depicted in the tsunami hazard map for the area (WDGER, 2003).

d) Mineral Resources

Due to the lack of substantial mineral resources in the vicinity of the site, the proposed action would have no impact on mineral resources.

5.2.2.3 Mitigation Measures

The following mitigation measures in relation to geological resources and hazards are recommended for the proposed action at Site Alternative 1:

- Use of the standards outlined in the SFO which in general include Recommended Provision (RP) 6, *Standards for Existing Federally Owned and Leased Buildings*, the International Building Code (IBC) for new buildings and Unified Facilities Criteria (UFC) 4-152-01, *Design for Piers and Wharfs*.

5.2.3 Site Alternative 2: Port Angeles

5.2.3.1 Existing Environment

The proposed action at Site Alternative 2 includes uplands, shoreline, and intertidal, subtidal and nearshore areas of Port Angeles Harbor. It is located in western Washington between the Olympic Mountains and the Strait of Juan de Fuca. An escarpment rising to over 200 feet begins approximately 500 feet south of the site boundary, with topographic increases further towards the south to the Olympic Mountain Range.

The surficial geologic units in the vicinity of the site were interpreted from maps prepared by the WDNR. These include the Geologic Map of the Port Angeles and Ediz Hook (Schasse, Wegmann, & Plenz, 2004) and the Geologic Map of the Washington Portion of Port Angeles (Schasse, 2003).

The site is located on recent fill material consisting of clay, silt, sand, gravel, organic matter, riprap, and debris emplaced between approximately 1890 and 1940 to elevate and reshape the land surface as part of the expansion of Port facilities. Much of the fill material was dredged from Port Angeles Harbor and generally varies in thickness from approximately 5 to 15 feet. Soils underlying the fill material consist of Pleistocene glacial outwash and drift as well as

Holocene to recent beach and alluvium deposits. The Port Angeles area was occupied several times during the Pleistocene by the edge of the Juan de Fuca Lobe of the Cordilleran continental ice sheet resulting in recessional glacial outwash and glaciomarine drift deposits of Vashon age. The recessional continental glacial outwash consists of loose, well rounded gravel, sand silt, clay, and locally peat deposited by glacial meltwater as opposed to non-glacial streams. These deposits locally grade up into or interfinger with post-glacial alluvium. The glaciomarine drift deposits (Vashon drift) in the Port Angeles area consists of weakly stratified pebbly silt and clay and discontinuous layers of silty sand. Underlying the glacial deposits is Tertiary (upper Eocene to lower Miocene) sedimentary and volcanic bedrock of the Twin River Group. The upper members of this group include the Pysht Formation and Makah Formation which consist of marine mudstone, siltstone, claystone, sandy siltstone, and calcareous sandstone (often containing fossil shells and plants).

The Olympic Mountain Range, beginning approximately one to two miles south of the site, are comprised of complexly deformed Eocene and Younger Tertiary rocks, including the Aldwell Formation and Crescent Formation. Rocks in the core of the Olympic Mountain Range are part of the Olympic subduction complex that formed during Paleocene subduction of the Juan de Fuca plate to the west. Several thrust faults and folds related to subduction are present in this area.

No major fault lines exist on, or within one mile of the site. However, mapped faults to the south within the Olympic Mountain Range include a west trending series of potentially active imbricate blind thrust faults referred to as the Lower Elwha fault where the northern side of the fault trace is upthrown. This fault is located 1.5 miles south of the site, along the mapped Clallam syncline that plunges eastward. Further south is another potentially active west trending thrust fault known as the Lake Creek-Boundary Creek fault. Additionally, two inferred transverse faults with northeast and northwest strikes that cut regional structural trends are also located approximately two to three miles south of the subject property. These two faults together form a graben between them.

Groundwater is reportedly present at the site at depths of approximately nine to ten feet bgs. The groundwater flow direction is generally to the north toward Port Angeles Harbor, however, Tumwater Creek, which is a losing stream, likely acts as a divide for local groundwater flow (Landau, 2009).

According to the Site Class Map of Clallam County, Washington (Palmer, 2004a) prepared by the WDNR, the designated National Earthquake Hazard Reduction Program site class for the subject property is Site Class D to E.

According to the Minerals Yearbook for the state of Washington (USGS, 2005A), no major mineral producing areas exist in Clallam County. It appears that there are no substantial mineral resources or existing mineral resource recovery operations on or near the site.

5.2.3.2 Environmental Consequences

a) Landslide Hazards

According to slope stability maps for the Port Angeles area prepared by the Washington Department of Ecology (WDOE, also known as Ecology), the site is classified as "modified" (WDOE, 1979). This classification means that slopes in the vicinity of the site are highly modified by human activity and include areas of significant excavation or filing. Slope response to a combination of natural processes and human activities at the site may be unpredictable. However, since the site is level (no significant slope), the potential for landslide hazards is negligible.

b) Erosion Hazards

The site is in an industrially developed area where the erosion hazard is considered relatively low; however, certain soil types at the site may be susceptible to minor erosion when disturbed by construction, particularly if slopes are constructed which exceed 15 percent grade.

c) Seismic Hazards

Western Washington is a seismically active area and has a history of relatively large earthquakes. A discussion of potential seismic hazards at the site is provided below.

i 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 site. Soils are relatively soft to loose fill material that can amplify earthquake ground motions at various frequencies. Consequently, the near-surface soils could affect the level of earthquake ground shaking felt in the area. The site may be subject to ground motion amplification and subsequent liquefaction during a significant earthquake event.

The presence of Site Classes D and E at the site (Palmer, 2004a) represents softer soil conditions which result in a greater amplification of ground shaking. The site class map is meant only as a general guide to delineate areas based on their potential for enhanced ground shaking. The data used in the site class map is based on regional geologic mapping, and therefore, cannot be used to make a final determination at any specific locality. This determination requires a site-specific geotechnical evaluation performed by a qualified professional.

ii Ground Rupture

No major faults exist within one mile of the site. However, numerous mapped fault zones exist to the south and west. Due to the distance between the site and these fault zones, it is unlikely that ground rupture would occur at the site.

iii Liquefaction

Most areas at and near the site contain surficial fill material underlain by loose native deposits that would likely be subject to liquefaction during a major seismic event. According to the Liquefaction Susceptibility Map of Clallam County, Washington (Palmer, 2004b) prepared by the WDNR, the site is mapped as having a moderate to high liquefaction susceptibility. The liquefaction susceptibility map is meant only as a general guide to delineate areas prone to liquefaction. The data used in the liquefaction susceptibility map is based on regional geologic mapping, and therefore, cannot be used to make a final determination at any specific locality. This determination requires a site-specific evaluation performed by a qualified geotechnical professional.

iv Tsunamis

The CSZ is a significant seismic and tsunami hazard for the entire Pacific Northwest. Geologic evidence from stratigraphic studies suggest that great earthquakes (greater than magnitude 8) have occurred along the CSZ with an estimated recurrence interval between 500-540 years. The geometry of the CSZ suggests that a megathrust earthquake would generate vast areas of coastal subsidence and offshore uplift that would displace tremendous amounts of water. The displaced water would result in a tsunami propagating along the outer Washington coast and into the Strait of Juan de Fuca. Modeling info for Strait of Juan de Fuca suggests water level change of up to 2 meters based on 9.1 magnitude earthquake with average rupture of 1,050 km in length and 70 km in width (NOAA, 2004). The potential impacts of a tsunami at the project site include the adverse effects of temporary inundation by the tsunami wave and damage/injury caused by debris carried by the wave.

d) Mineral Resources

Due to the lack of substantial mineral resources in the vicinity of the site, the proposed action would have no impact on mineral resources.

5.2.3.3 Mitigation Measures

The following mitigation measures in relation to geological resources and hazards are recommended for the proposed action at Site Alternative 2:

- Use of the standards outlined in the SFO which in general include RP6, *Standards for Existing Federally Owned and Leased Buildings*, the IBC for new buildings and UFC 4-152-01, *Design for Piers and Wharfs*.

5.2.4 Site Alternative 3: Bellingham

5.2.4.1 Existing Environment

Site Alternative 3 includes reclaimed land formed by filling a tidal flat area at the southern portion of the Whatcom Creek Delta, at the eastern shoreline of the Bellingham Bay. Sehome Hill, approximately 2,000 feet southeast of the site boundary, rises to over 600 feet with topographic increases further south towards the Lookout Mountains.

The surficial geologic units at and near the site were interpreted from relevant geologic maps (Easterbrook, 1976; WDGER, 2000) and other investigations that have been conducted at or near the site (Landau Associates, 2007; Blumen Consulting Group, 2008).

The site is located at the eastern shore of the Bellingham Bay, shaped by the advance and retreat of the Cordilleran Ice Sheet between 12,000 and 18,000 years ago, as well as by subsequent sedimentation and filling activities. The site represents a historic beach and intertidal area along the Bellingham Bay shoreline that has been artificially filled in the past.

Geologic formations at or near the site include, from the oldest and deepest to the most shallow and youngest formation: the Chuckanut Formation (sandstone and carbonaceous shale), the Beach Deposits (located at the tidal flat area and include loose, fine to medium sand) and Fill/Modified Land (dredge fill, rip-rap, and gravel).

- The Chuckanut Formation is the bedrock that underlies the site and consists of an Eocene nonmarine sedimentary rock including fractured sandstone, siltstone and carbonaceous shale. Coal seams present at depth in certain portions of the Chuckanut formation were previously mined in the Bellingham area in the 1800s. The bedrock has an undulating surface that has been eroded by glaciers and water. The Chuckanut Formation is present near the ground surface and forms the bluff south of the site. The depth to the top of the Chuckanut Formation varies significantly, and may be present at depths of more that 30 to 60 feet bgs.
- The Beach Deposits that constitute the underlying tidal flat area consist of clayey silt and silty sand in the upper 15 feet and fine to medium sand in the lower 20 feet. Shell and wood fragment are occasionally present in these deposits.
- Artificial filling at the site was accomplished between the 1950s and 1960s, with dredge fill from Whatcom Waterway, rip-rap, and gravel. Fill materials at the site are highly

variable and may consist of sand, silt, clay, gravel, sawdust and/or wood fragments, construction debris (bricks, concrete, etc.) and mixtures of these fill materials. Variable efforts of compaction may have been made at the site. Consequently, the relative density of the fill would vary widely and specific engineering properties of the fill materials may be different from location to location (Aspect Consultants, 2009).

The region where the site is located contains numerous fault zones, including the Boulder Creek fault and the Sumas and Vedder Mountain faults, located approximately ten miles northeast of Bellingham near Sumas and Kendall, respectively.

The site has been mapped within Site Class E in the Site Class Map of Whatcom County for ground shaking (WDGER, 2004c), and is also within an area of high liquefaction susceptibility (WDGER, 2004d).

Groundwater is present at depths between 3 to 12 feet bgs within the fill materials. Groundwater flow has been reported to be towards Bellingham Bay and be tidally influenced. Groundwater quality is influenced by the presence of the sea and there are no known uses for groundwater at the site (Landau Associates, 2007).

According to the Minerals Yearbook for the state of Washington (USGS, 2005A), mineral producing areas for olivine and sulfur (oil) exist in Whatcom County, as well as cement and aluminum plants. However, it appears that there are no substantial mineral resources or existing mineral resource recovery operations on or near the site.

5.2.4.2 Environmental Consequences

a) Landslide Hazards

Specific landslide hazard areas at or near the site may include, but are not limited to steep slopes, slopes that are parallel or subparallel to planes of weakness in subsurface materials, marine bluffs along present and historic shorelines of Bellingham Bay and areas mapped by the City of Bellingham as a geologic hazard area with high landslide potential. A general reconnaissance of the bluff and steep slope areas conducted during previous geological investigations (Landau Associates, 2007) did not identify areas of significant slope instability that would affect future site development at or near the site. Additionally, the site area is included in the lowest priority group for landslide hazard mapping (Easterbrook, 2009) and is not included in any mapped landslide hazard areas (WDNR, 2009b).

b) Erosion Hazards

The site is in an urban environment where the erosion hazard is considered relatively low; however, certain soil types at the site may be susceptible to erosion when disturbed by construction, particularly if slopes are constructed which exceed 15 percent grade.

c) Seismic Hazards

Western Washington is a seismically active area and has a history of relatively large earthquakes. USGS and other researchers continue to evaluate the presence and potential of the nearest fault systems to the site, including the Boulder Creek fault and the Sumas and Vedder Mountain faults, approximately ten miles northeast of the site. Recent research (Landau, 2007) suggests that seismic hazards in the Bellingham area may be greater than previously estimated.

i Ground Shaking / Ground Motion Amplification

The site lies within a seismically active area, and moderate to high levels of ground shaking should be anticipated during the design life of the facility project. Additionally, the site is located over deposits of relatively soft to loose soils that may amplify earthquake ground motions at various frequencies. Consequently, the near-surface soils at the site could affect the level of earthquake ground shaking felt in the area.

The presence of Site Class E soils on the site (WDGER, 2004c), represents areas where the increase of the ground shaking in case of an earthquake would be very high. The site class map is meant only as a general guide to delineate areas based on their potential for enhanced ground shaking. The data used in the site class map is based on regional geologic mapping, and therefore, cannot be used to make a final determination at any specific locality. This determination requires a site-specific geotechnical evaluation performed by a qualified professional.

ii Ground Rupture

No major faults exist at or within less than ten miles of the site, therefore it is unlikely that ground rupture would occur at the site.

iii Liquefaction

Several geological reports (Landau, 2007; Blumen, 2008) have reported the presence of surficial fill materials and native deposits at or near the site, which would likely be subject to liquefaction during a major seismic event. Liquefaction susceptibility maps (WDGER, 2004d) indicate that the majority of the site is mapped as having high liquefaction susceptibility. The depth and extent of potentially liquefiable soil deposits is dependent on specific soil and groundwater conditions

and would be highly variable across the site. The actual magnitude and extent of soil liquefaction would depend on many factors including the duration and intensity of the ground shaking during the seismic event, and specific soil and groundwater conditions.

The liquefaction susceptibility map is meant only as a general guide to delineate areas prone to liquefaction. The data used in the liquefaction susceptibility map is based on regional geologic mapping, and therefore, cannot be used to make a final determination at any specific locality. This determination requires a site-specific evaluation performed by a qualified geotechnical professional.

iv Tsunamis

WDGER and NOAA have published estimates of tsunami inundation in Bellingham Bay area based on computer modeling of ground deformation and waves that may be generated by a CSZ earthquake (Walsh, *et al*, 2009). The results of this modeling study indicate that a magnitude 9.1 CSZ earthquake may result in a tsunami wave that could cause a depth of inundation of 0 to 1.6 feet in the site area. It should be noted that the modeling study recognized certain limitations that make the study "not of sufficient resolution to be useful for land-use planning."

d) Mineral Resources

Due to the lack of substantial mineral resources in the vicinity of the site, the proposed action would have no impact on mineral resources.

5.2.4.3 Mitigation Measures

The following mitigation measures in relation to geological resources and hazards are recommended for the proposed action at Site Alternative 3:

- Use of the standards outlined in the SFO which in general include RP6, *Standards for Existing Federally Owned and Leased Buildings*, the IBC for new buildings and UFC 4-152-01, *Design for Piers and Wharfs*.

5.2.5 Site Alternative 4: Newport

5.2.5.1 Existing Environment

Site Alternative 4 includes reclaimed land formed by filling a tidal flat area at the northern shore of the Yaquina Bay. The site slopes from roughly the center of the property to the north and south. The center is basically level and on grade with the adjacent street.

The site is located in western Oregon within the Coast Range, an elongated geological province with a varied geologic history including an ancient volcanic island chain colliding with North

America about 50 million years ago and post-collision marine sedimentation (Oregon Department of Geology and Mineral Industries [DOGAMI], 2009a). The subduction activity from the CSZ creates fresh magma which rises and erupts in the Cascade Range, approximately 40 miles east of the site.

Materials at or near the site would include artificial fill, alluvial deposits (Holocene), and terraces deposits (Pleistocene). The Nye Mudstone formation including laminated mudstone and siltstone is present further to the southeast (DOGAMI, 1986).

The site elevation was established area from dredged material excavated from the bay; therefore fill materials underneath the site may consists of a mix of gravel, sand, and silt with a potential presence of trash and garbage. The thickness of the fill materials is estimated to be around eight feet (Schlicker & Associates, 2005). Underlying alluvial deposits consist of unconsolidated stream clay, silt, sand, and gravel; beach sand and gravel; and dune sand. Terrace deposits are present near the site to the south and consist of elevated marine terraces of semi-consolidated silt, sand and gravel. Thickness of the native materials at or near the site may range from zero to 80 feet bgs.

According to the earthquake hazard maps for Oregon (DOGAMI, 1996), there are two east-west trending faults located near the site within ten miles to the north and south. These faults have had movement during the Late Quaternary (in last 780,000 years) but due to the scale of the map it was not possible to determine their exact location with respect to the site.

The nearest mapped potentially active faults are the Yaquina Head Fault located four miles north of the site, and the Yaquina Bay Fault located along the north side of the Yaquina Bay. The Yaquina Bay Fault is a generally east-northeast trending oblique fault that also has left-lateral strike-slip and either contractional or extensional dip-slip offset components. This fault is believed to extend offshore for approximately seven to eight miles and may be a structurally controlling feature for the mouth of Yaquina Bay. Although the age for the last movement of the Yaquina Bay Fault is not known, the fault offsets 80,000 year old marine terrace sediments (Schlicker & Associates, 2005).

Amplification hazard maps (DOGAMI, 2009b), show the site within the Highest Amplification Area (UBC soil type E). The hazard zones depicted in this map are based on geologic and geophysical data. Additionally, the site area is classified as a “Considerable damage in specially designed structures, great damage in ordinary structures” area in the maps of maximum earthquake shaking for several frequencies of occurrence of once every 1,000, 2,500 and 500 years (DOGAMI, 2009c).

A review of the USGS well logs for properties located within one mile of the subject property indicate shallow groundwater is expected to be present at approximately six to eight feet bgs at

the site in the fill material. Groundwater flow is estimated to be from south to north toward Yaquina Bay. Groundwater level and flow may be tidally influenced and present local variations related to the heterogeneity of the fill material.

According to the Minerals Yearbook for the state of Oregon (USGS, 2005b), mineral producing areas for crushed stone exist in Lincoln County, however it appears that there are no substantial mineral resources or existing mineral resource recovery operations on or near the site.

5.2.5.2 Environmental Consequences

a) Landslide Hazards

According to the Statewide Landslide Inventory Data for Oregon (DOGAMI, 2009f), the site is not located in any of the landslide areas. Also, according to the hazard map of earthquake-induced landslides, the site is located in a Low Landslide Hazard Zone (DOGAMI, 2009d).

This classification means that slopes in the vicinity of the site are highly modified by human activity and include areas of significant excavation or filing. Slope response to a combination of natural processes and human activities at the site may be unpredictable. However, since the site is level (no significant slope), a very low landslide potential exists at the site.

b) Erosion Hazards

The site is in an industrially developed area where the erosion hazard is considered relatively low; however, certain soil types at the site may be susceptible to minor erosion when disturbed by construction, particularly if slopes are constructed which exceed 15 percent grade.

c) Seismic Hazards

The site is located in an active seismic zone, with a likelihood of great earthquakes originating offshore and onshore. Great subduction earthquakes occur along a great offshore fault that parallels the Oregon and Washington coasts along the CSZ.

According to the relative earthquakes hazard map (DOGAMI, 2009c), the site area is classified as a Zone A area (Highest Hazard). Hazards zones depicted in this map are based on the combined effects of ground shaking amplification, liquefaction, and earthquake-induced landsliding.

i Groundshaking / Ground Motion Amplification

The site area is classified as a Highest Amplification Area (UBC soil type E) and is within an area where “considerable damage in specially designed structures, great damage in ordinary structures” is expected (DOGAMI, 2009b).

ii Ground Rupture

The nearest fault to the site is the Yaquina Bay Fault, which is located north of the site along the north side of the Yaquina Bay. Due to the distance between the site and this fault, it is likely that ground rupture may occur at the site. Although the age for the last movement of the Yaquina Bay Fault is not known, the fault offsets 80,000 year old marine terrace sediments. Consequently, the near-surface soils could affect the level of earthquake ground shaking felt in the area. The Site may be subject to ground motion amplification during a significant earthquake event.

iii Liquefaction

Most areas at and near the site contain surficial fill material underlain by loose native deposits that would likely be subject to liquefaction during a major seismic event. According to liquefaction hazard maps for the Newport area (DOGAMI, 2009e), the site area is within the highest Liquefaction Hazard Area. The liquefaction susceptibility map is meant only as a general guide to delineate areas prone to liquefaction. The data used in the liquefaction susceptibility map is based on regional geologic mapping, and therefore, cannot be used to make a final determination at any specific locality. This determination requires a site-specific evaluation performed by a qualified geotechnical professional.

The depth and extent of potentially liquefiable soils is dependent on specific soil and groundwater conditions and could vary across the site. The actual magnitude and extent of soil liquefaction would also depend on the duration and intensity of ground shaking during a seismic event.

Liquefaction could result in widespread structural damage of buildings and utilities if not properly mitigated. Damage caused by liquefaction can include: foundation rotation, slope failure, lateral spreading, and post-liquefaction ground subsidence (settlement).

iv Tsunamis

The central Oregon coast, including low-lying areas at or near Newport and Yaquina Bay, is susceptible to both locally generated (CSZ) tsunamis and those from more distant Pacific Ocean wave generating sources (DOGAMI, 1997). The site is within the area that would be inundated by flood water from a tsunami caused by a magnitude 8.8 undersea earthquake. The line delineating the inundation area at Yaquina Bay varies in elevation and is roughly midway between sea level and the 40-foot topographic contour. The actual inundation depth would depend on the size of the tsunami (U.S. Department of the Interior, *et al*, 1995). A moderately low run-up event would effectively bisect the subject property. Most structures at or near the project area along the Yaquina Bay shore would be fully impacted by a potentially large (i.e., 8.8 magnitude) tsunamis originating from the local CSZ fault system (Priest, 2009). Typical wave

heights from tsunamis occurring in the Pacific over the last 80 years have been between 20 to 45 feet at the shoreline. Additionally, the site is located in an "Evacuation Zone in case of Tsunami" (DOGAMI, 2005).

d) Mineral Resources

Due to the lack of substantial mineral resources in the vicinity of the site, the proposed action would have no impact on mineral resources.

5.2.5.3 Mitigation Measures

The following mitigation measures in relation to geological resources and hazards are recommended for the proposed action at Site Alternative 4:

- Use of the standards outlined in the SFO which in general include RP6, *Standards for Existing Federally Owned and Leased Buildings*, the IBC for new buildings and UFC 4-152-01, *Design for Piers and Wharfs*.

5.3 AIR QUALITY

The Clean Air Act (CAA) is a comprehensive federal law that regulates air emissions from area-wide, stationary, and mobile sources. It authorizes the USEPA to establish National Ambient Air Quality Standards (NAAQS) to protect public health and the environment. The NAAQS include standards for the following criteria pollutants: nitrogen dioxide (NO_2), ozone (O_3), carbon monoxide (CO), sulfur dioxide (SO_2), and particulate matter less than 10 micrometers in diameter (PM_{10}) and particulate matter less than 2.5 micrometers in diameter ($PM_{2.5}$). The NAAQS, along with the state of Washington Ambient Air Quality Standards (WAAQS) are summarized below in **Table 5.3-1**. The state of Oregon Ambient Air Quality Standards (OAAQS) are the same as the Federal NAAQS (ODEQ, 2007). It is noted that WAAQS generally correspond to the NAAQS, except for annual average SO_2 and 24-hour SO_2 standards. The WAAQS for annual average SO_2 and 24-hour SO_2 are more stringent than the NAAQS (WDOE, 2009a).

Areas in which ambient air concentrations of a pollutant exceed the state and/or federal standard are considered to be non-attainment areas for that pollutant. Non-attainment areas may be classified as basic, serious, severe, or extreme non-attainment areas for a given criteria pollutant. Non-attainment areas are required to develop and execute plans, known as State Implementation Plans (SIPs) that describe how the area will meet federal and state air quality standards. Areas that have achieved attainment may be designated as "maintenance areas," which are subject to maintenance plans showing how the area will continue to meet federal and state air quality

standards. The CAA requires that non-attainment and maintenance areas (with respect to the NAAQS) prepare individual SIPs. Federal actions must demonstrate conformity to any SIP.

Table 5.3-1: State and National Ambient Air Quality Standards

Pollutant	Average Time	Federal NAAQS[A]		Washington NAAQS
		Primary	Secondary	
Carbon Monoxide (CO)	8 - Hour Average	9 ppm	9 ppm	9 ppm
	1 - Hour Average	35 ppm	35 ppm	35 ppm
Lead (Pb)	Quarterly Average	1.5 µg/m^3	1.5 µg/m^3	No standard
Nitrogen Dioxide (NO_2)	Annual Average	0.053 ppm	0.053 ppm	0.05 ppm
Ozone (O_3)	1 - Hour Average	0.12 ppm	0.12 ppm	0.12 ppm
	8 - Hour Average [B]	0.08 ppm	0.08 ppm	No Standard
Particulate Matter (PM_{10})	Annual Arithmetic Mean	No Standard	No Standard	50 µg/m^3
	24 - Hour Average	150 µg/m^3	150 µg/m^3	150 µg/m^3
Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	15 µg/m^3	15 µg/m^3	No Standard
	24-Hour	35 µg/m^3	35 µg/m^3	No Standard
Sulfur Dioxide (SO_2)	Annual Average	0.030 ppm	No Standard	0.02 ppm
	24 - Hour Average	0.14 ppm	No Standard	0.10 ppm
	3 - Hour Average	No Standard	0.5 ppm	No Standard
	1 - Hour Average	No Standard	No Standard	0.40 ppm [C]
Total Suspended Particulates	Annual Geometric Mean	No Standard	No Standard	60 µg/m^3
	24 - Hour Average	No Standard	No Standard	150 µg/m^3

(A) State of Oregon standards (OAAQS) are the same as the Federal NAAQS.
(B) Eight hour ozone standard went into effect on September 16, 1997. But implementation is limited.
(C) 0.25 not to be exceeded more than two times in any 7 consecutive days.
Source: WDOE, 2009a.

The USEPA promulgated a General Conformity Rule (GCR) (Title 40 CFR Part 51.853) that requires responsible federal agencies make a determination of conformity with the SIP for a major undertaking. Each action within a non-attainment or maintenance area must be reviewed to determine whether it: 1) qualifies for an exemption listed in the GCR; 2) results in emissions that are below GCR *de minimis* emissions thresholds; or 3) would produce emissions above the GCR *de minimis* thresholds applicable to the specific area, requiring a detailed air quality conformity analysis.

The proposed action could have adverse effect on air quality due to project-generated pollutant emissions should the cumulative net increase result in any of the following GCR *de minimis* thresholds be exceeded:

- Volatile Organic Compounds (VOC) 100 tons per year
- Oxides of Nitrogen (NOx) 100 tons per year

- CO 100 tons per year
- PM_{10} 100 tons per year
- SO_2 100 tons per year

It is possible to estimate a project's incremental contribution of CO_2, a greenhouse gas (GHG), into the atmosphere. However, it is typically not possible to determine whether or how an individual project's relatively small incremental contribution might translate into physical effects on the environment. Given the complex interactions between various global and regional-scale physical, chemical, atmospheric, terrestrial, and aquatic systems that result in the physical expressions of global climate change, it is impossible to discern whether the presence or absence of CO_2 emitted by the proposed project would result in any altered conditions. Due to the lack of federal significance criteria for GHG and the difficulty of determining project-specific quantitative effects, the significance of project CO_2 emissions has been evaluated based on the GHG policies in Washington and Oregon.

In February 2007, the Governor of Washington issued the Climate Change Challenge EO 07-02, which established goals for reducing GHGs. As a result, the Climate Change Framework legislation (House Bill 2815 and Senate Bill 6516) was developed which will require certain entities to report their GHG emissions beginning in 2010. GHG reporting is required for operations that exceed 10,000 metric tons, or from motor vehicles that exceed 2,500 metric tons. At this time, the WDOE has not identified a significance threshold for GHG emissions for the non-power sector.

On Oct. 23, 2008, the Oregon Department of Environmental Quality (ODEQ) approved new GHG reporting rules. The ODEQ requires permitted facilities to report emissions for calendar year 2009 if the facilities that have a Title V permit and emit 2,500 metric tons of combined GHGs measured as metric tons of CO_2 equivalents ($mtCO_2e$) per year; or are a subset of facilities with Air Discharge Contaminant Permits and emit 2500 $mtCO_2e$ per year. Again, the ODEQ has not identified a significance threshold for GHG emissions.

Current and future vehicle emissions from MOC-P staff, contractor and crew trips and as well as from truck deliveries were ascertained using emission factors from the USEPA MOBILE6.2 model. For the vehicle emission estimates at each alternative, regionally-specific emission factors were applied using inputs from local air quality management agencies.

Fugitive entrained road dust emissions from vehicle travel on paved roads were calculated using emission factors from the USEPA's *Office of Air Quality Planning and Standards* (USEPA, 2009b), also known as AP-42. These emission factors are representative values that relate the quantity of a pollutant released to the atmosphere with an activity associated with the release of

that pollutant. In most cases, these factors are simply averages of all available data of acceptable quality, and are generally assumed to be representative of long-term averages for all facilities in the source category (i.e., a population average).

For the state of Oregon fugitive dust emissions, the silt loading factors for the paved roads is obtained from the ODEQ document "*Emission Estimates for the Medford-Ashland Air Quality Management Area*" for low average daily travel roads (ODEQ, 2004). This silt loading value is used due to the proximity to the site and lack of project specific data. The region is assumed to have 200 wet days per year (USEPA, 2009b).

The estimated trip amounts discussed in this section would generally apply to each Site Alternative. The analysis of vehicular emissions is based on anticipated maximum daily and seasonal trips by staff, visitors, crew, contractors and vendors. Approximately 18 on-site contractors would commute to the project Site Alternatives or to other locations under the No-Action Alternative, every weekday. Roughly 10 other specialty contractors and 70 NOAA researchers would commute to the site only 4 times a year. When the ships are berthed at MOC-P, there would be a maximum of 75 NOAA staff members that would commute to the site on the weekdays. During the rest of the year, only about 45 NOAA staff members would commute to the site on weekdays. About 62 of the MOC-P officers and engineers would commute to the selected site on weekdays from November through March, and 4 times a year from April through October. Four of the MOC-P managing officers would commute on the weekdays. It is assumed that the 115 vessel mariner crew would commute about 4 times a year. Large truck deliveries may occur an average of ten times per month during November through March, and at the rate of three trips per month during the rest of the year. Small truck deliveries would take place every weekday.

For vehicle emissions calculations, an assumed average travel distance of 25 miles/trip was used. Contractors and crew are assumed to make 3.02 trips/days to accommodate for travel to and from the site and other trips such as lunch trips, etc. Truck deliveries are assumed to make 2.0 trips/ day to accommodate for travel to and from the site.

Dock-side emissions evaluated include a natural gas-powered steam boiler used to generate steam for the ships that are docked. Emissions from the boiler were estimated using AP-42 emission factors for Natural Gas Combustion (USEPA, 2009b). The heating value of the natural gas is assumed to 1020 British Thermal Units per standard cubic feet based on the standard value used in AP-42. In addition, propane-powered forklifts and cranes would be used sporadically for daily port activities. The emissions from forklifts and cranes are assessed qualitatively since the equipment is not constantly used. Hot work such as welding would performed as part of the dock

side maintenance activities. Emissions from welding are also assessed qualitatively because these activities take place on a temporary and infrequent basis.

Vessels are typically berthed at MOC-P from about November through March and may return for roughly two weeks for reassignment during the remaining months of the year (i.e., summer). Marine emissions were calculated using emission factors for slow cruise, maneuvering and hotelling modes from the USEPA's *Analysis of Commercial Marine Vessels Emissions and Fuel Consumption Data* guidance (USEPA, 2000). It is assumed that a maximum of six ships would be berthed during the months of November through March and for two weeks during the summer (a worst-case assumption). Of these ships, only three would require steam for heating and power. Two ships are assumed to connect to the steam boiler when docked during the summer and winter. The NOAA ship Miller Freeman may use its on-board auxiliary boiler when berthed during the summer; however during the winter Miller Freeman would use dock-side steam from the boiler. Hence, only the Miller Freeman vessel could have hotelling emissions occur when berthed at MOC-P during the fair-weather season. For the purposes of emissions estimates, NOAA vessels expected to regularly berth at MOC-P, as discussed in the Section 3 of this EA, are assumed to operate in a slow cruise mode. Emissions from operations were considered out to three nautical miles from the coast, the limit of jurisdiction for WDOE and ODEQ.

5.3.1 No-Action Alternative

5.3.1.1 Existing Environment

In the short-term (until the existing MOC-P lease at Lake Union lapses) the No-Action Alternative assumes continuation of upland activities at the existing MOC-P site on Lake Union and continuation of NOAA vessels at temporarily arranged berths in the Pacific Northwest. In the longer-term, following lapse of the existing lease at the Lake Union site, the administrative, warehouse and shop functions would be dispersed to existing government or leased facilities at unknown locations in the Pacific Northwest, and NOAA vessels would continue to be berthed indefinitely at temporarily arranged berths in the Pacific Northwest. More detail on the No-Action Alternative is given in Section 4.3 above.

The present MOC-P site is within a maintenance area for O_3 and CO. To be conservative under this scenario, a General Conformity Analysis will be performed for administrative and warehouse operations at Lake Union and vessel berthing activities elsewhere within the same air basin. The project emissions will be compared to the GCR *de minimis* thresholds for VOC, NOx, CO, PM_{10} and SO_2.

The existing environment of the Lake Union area and surrounding air basin in relation to air quality is described more fully in Section 5.3.2.1 below.

5.3.1.2 Environmental Consequences

Under the No-Action Alternative, there would be negligible changes to the volume, frequency or nature of air emissions from the existing MOC-P activities in the short-term, as there would be no change from the existing situation in terms of MOC-P operations. As such, the change in impacts on air quality from the No-Action Alternative would be negligible.

In the longer-term, following lapse of the existing lease at the Lake Union site, upland activities would disperse to other locations in the Pacific Northwest, and NOAA vessels would continue to be berthed at temporarily arranged berths in the Pacific Northwest. The permanent location of MOC-P operations is unknown under the No-Action Alternative, therefore an assessment of the consequences at a location not considered in this EA would be required under NEPA if the No-Action Alternative were selected.

For this analysis, project emissions would be the same as the present baseline emissions, irrespective of the location of the activities. Project related marine emissions as shown in **Table 5.3-2** are below the GCR *de minimis* thresholds; therefore, emissions are considered less than significant.

Table 5.3-2: Summary of Estimated Maximum Pollutant Emissions at Present Site

	Emissions (tons per year)						
Parameter	**CO**	**VOC**	**NOx**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**CO_2**
Steam Boiler	0.77	0.05	0.91	0.07	--	0.01	1094.12
Marine	0.62	0.14	5.94	0.15	--	4.42	393.57
Worker Commute	33.23	2.39	1.51	--	--	--	--
Contractor/Visitor Commute	7.09	0.51	0.32	--	--	--	--
Truck Deliveries	0.17	0.06	0.32	--	--	--	--
Fugitive Dust from Paved Roads	--	--	--	2.56	0.10	--	--
Total	**41.87**	**3.15**	**9.00**	**2.78**	**0.10**	**4.42**	**1487.69**
GCR *De Minimis* Levels	100	100	100	N/A	N/A	N/A	N/A

Notes:

(1) *The GCR De Minimis threshold for CO, VOC, NOx,, PM_{10}, SO_2 is 100 tons per year. The present site at Lake Union is a maintenance area for O_3 and CO. Future unknown port locations might be attainment, maintenance or non-attainment area. To be conservative the project emissions are compared to all GCR de minimis thresholds.*

(2) *GCR De Minimis thresholds do not exist for $PM_{2.5}$ and CO_2.*

Similarly, although the No-Action Alternative would produce GHG emissions from operation and marine activities, these would be the same as present baseline emissions. In any case, GHG emission impacts under the No-Action Alternative are expected to be less than significant, based on the 2005 Washington GHG emission estimate and the 2000 Puget Sound emissions estimate.

5.3.1.3 Mitigation Measures

No mitigation measures with respect to air quality are recommended under the No-Action Alternative.

5.3.2 Site Alternative 1: Lake Union

5.3.2.1 Existing Environment

The present site at Lake Union falls within the jurisdiction of USEPA Region 10, the WDOE and locally within the Puget Sound Clean Air Agency (PSCAA). The PSCAA regulates air emissions and also grants permits to operate to sources of air pollutants in King, Kitsap, Pierce and Snohomish counties. Coastal waters within three nautical miles of a shoreline are part of the same air quality jurisdiction as the contiguous land area. Therefore, the waters within three nautical miles of the present site are within the jurisdiction of the WDOE.

The weather in the Puget Sound region is largely a result of maritime influences and diverse topography. The region has a modified marine climate. For most of the year the region's weather is dominated by influxes of clean, moist ocean air that penetrate at low elevations from the Chehalis gap to the south and the Strait of Juan de Fuca to the north. Temperatures are generally moderate with few extremely cold or hot days throughout the year. The annual high temperature is around 75 degrees Fahrenheit (ºF) in July and the low is around 37 ºF in January (National Climate Data Center, 2009).Wind-driven mixing regularly occurs which effectively disperses air pollutants. During periods when the onshore air flow is interrupted, the combined effects of urban activities, the weather and topography lead to stagnation and rising air pollution. The Olympic Mountains to the west and the Cascade mountain range to the east form the sides of a bowl when air pollution becomes trapped in the urban basin.

Temperature inversions are also relatively common in the Puget Sound area, a reversal of the more usual temperature decrease with height in the lower atmosphere. As the inversion continues, air becomes stagnant and pollution becomes trapped close to the ground. Since the area lies in a basin, this inversion condition of hindered pollutant dispersion can persist (PSCAA, 2009).

Air quality regulations specific to the State of Washington are shown in **Table 5.3-1** above. The present MOC-P site is within a maintenance area for O_3 and CO. The project emissions will be compared to the GCR *de minimis* thresholds for VOC, NOx, CO, PM_{10} and SO_2.

5.3.2.2 Environmental Consequences

Land-based operational activities under Site Alternative 1 would result in criteria pollutant emissions. Emissions resulting from the project operations are broadly categorized as follows:

- Contractor vehicle emissions (CO, CO_2e, NO_X, PM_{10}, $PM_{2.5}$, SO_2 VOC);
- Crew vehicle emissions (CO, CO_2e, NO_X, PM_{10}, $PM_{2.5}$, SO_2, VOC);
- Small and large truck delivery emissions (CO, CO_2e, NO_X, PM_{10}, $PM_{2.5}$, SO_2, VOC);
- Fugitive dust from vehicles (PM_{10}, $PM_{2.5}$); and
- Natural gas powered steam boiler emissions (CO, CO_2e, NO_X, PM_{10}, SO_2, and VOC).

Employee and visitor vehicle emissions and truck emissions (including fugitive dust from paved roads) are generated from the combustion of fuels and from the entrainment of road dust during travel along roadways on site and off site. Boiler emissions are from the combustion of the natural gas used to generate steam for the ships. Equipment exhaust emissions from cranes and forklifts are considered insignificant since these activities occur sporadically. Welding emissions are also considered insignificant since these activities take place infrequently.

Project related operational emissions as shown in **Table 5.3-3**. These emission estimates are below the GCR *de minimis* thresholds, therefore air quality impacts would be less than significant.

Marine activities occur when the ships come to dock at the proposed site and would result in criteria pollutant emissions. Marine activities such as slow cruise, maneuvering and hotelling would result in CO, CO_2e, NO_X, PM_{10}, SO_2, and VOC emissions. Project-related marine emissions are shown in **Table 5.3-3**. These emissions are below the GCR *de minimis* thresholds, therefore air quality impacts would be less than significant.

Table 5.3-3: Summary of Estimated Maximum Pollutant Emissions – Site Alternative 1

	Emissions (tons per year)						
Parameter	**CO**	**VOC**	**NOx**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**CO_2**
Steam Boiler	0.77	0.05	0.91	0.07	--	0.01	1094.12
Marine	0.62	0.14	5.94	0.15	--	4.42	393.57
Worker Commute	33.23	2.39	1.51	--	--	--	--
Contractor/Visitor Commute	7.09	0.51	0.32	--	--	--	--
Truck Deliveries	0.17	0.06	0.32	--	--	--	--
Fugitive Dust from Paved Roads	--	--	--	2.56	0.10	--	--
Total	**41.87**	**3.15**	**9.00**	**2.78**	**0.10**	**4.42**	**1487.69**
GCR *De minimis* Levels	100	100	100	N/A	N/A	N/A	N/A

Notes:

(1) The GCR De Minimis threshold for CO, VOC and NOx is 100 tons per year because the area is considered a maintenance area for O_3 and CO.

(2) The area is considered to be in attainment for PM_{10} and SO_2, therefore there are no GCR De Minimis thresholds for these pollutants

(3) GCR De Minimis thresholds do not exist for $PM_{2.5}$ and CO_2.

GHG emissions for Site Alternative 1 would produce less than one percent of the total GHG produced by the state of Washington, and less that one percent of the total GHG produced in the Puget Sound region. The present site would contribute less than one percent to the GHGs from the transportation and energy supply sectors in the Puget Sound region (PSCAA, 2004).

King County is a maintenance area for O_3 and CO. The anticipated project emissions are presented in **Table 5.3-2** above. Under Site Alternative 1, the proposed action would not result in a substantial change in emissions within this air basin and would not result in a significant cumulative air quality impact.

GHG emission impacts from the proposed project are assumed to be minor, based on the 2005 Washington GHG emission estimate and the 2000 Puget Sound emissions estimate. However, it is not possible to evaluate whether or not the proposed project's GHG emissions combined with GHG emissions from other proposed projects in the vicinity would exacerbate global warming due to the complexity of the science.

5.3.2.3 Mitigation Measures

No mitigation measures with respect to air quality are recommended under Site Alternative 1.

5.3.3 Site Alternative 2: Port Angeles

5.3.3.1 Existing Environment

The proposed project is located near the city of Port Angeles, which is located in Clallam County. The proposed project falls within the jurisdiction of USEPA Region 10, the WDOE and locally within the Olympic Region Clean Air Agency (ORCAA). ORCAA covers air quality issues in Thurston, Mason, Pacific, Grays Harbor, Jefferson, & Clallam counties. Coastal waters within three nautical miles of a shoreline for the proposed project are part of the same air quality jurisdiction as the contiguous land area. Therefore, the waters within three nautical miles of the proposed project are within the jurisdiction of the WDOE.

The region enjoys a coastal climate and is mild throughout the year. The annual high temperature is around 68 ºF in July and the low is around 34 ºF in January. Average rain fall is 26 inches per year (National Climate Data Center, 2009). The weather in the region is impacted by two major natural features; water and mountains. The water, which nearly surrounds the area, keeps the temperature amazingly temperate on a year-round basis. The Olympic Mountains also play a big role in influencing the weather. Since they rise over 7,000 feet and are south and west of the region, the mountains create a rain shadow effect (Port Angeles Regional Chamber of Commerce, 2009).

Air quality regulations specific to the State of Washington are shown in **Table 5.3-1** above. The location of Site Alternative 2 is within an area designated as in attainment for all criteria pollutants. Therefore, a General Conformity Analysis is not required.

5.3.3.2 Environmental Consequences

Pile driving and removal would be performed using a hydraulic vibratory hammer powered by a diesel engine or compressor. A diesel crane would be used as well. Other construction equipment may include backhoes, front loaders and dump trucks.

Emissions from the construction activities are typical for similar actions and would be temporary. Emissions from these activities would be minor and their impact upon air quality insignificant.

Land-based operational activities under Site Alternative 2 would result in slight increases in criteria pollutant emissions. Emissions resulting from the project operations are broadly categorized as follows:

- Contractor vehicle emissions (CO, CO_2e, NO_X, PM_{10}, $PM_{2.5}$, SO_2, VOC);
- Crew vehicle emissions (CO, CO_2e, NO_X, PM_{10}, $PM_{2.5}$, SO_2, VOC);
- Small and large truck delivery emissions (CO, CO_2e, NO_X, PM_{10}, $PM_{2.5}$, SO_2, VOC);
- Fugitive dust from vehicles (PM_{10}, $PM_{2.5}$); and
- Natural gas powered steam boiler emissions (CO, CO_2e, NO_X, PM_{10}, SO_2, VOC).

Employee and visitor vehicle emissions and truck emissions (including fugitive dust from paved roads) are generated from the combustion of fuels and from the entrainment of road dust during travel along roadways on site and off site. Boiler emissions are generated from the combustion of the natural gas used to generate steam for the ships. Equipment exhaust emissions from cranes and forklifts are considered insignificant since these activities occur sporadically. Welding emissions are also considered insignificant since these activities take place infrequently.

The proposed project would result in a slight increase in criteria pollutant emissions levels. The project site is located in Clallam County, Washington which is considered attainment for all criteria pollutants. As such, operational emissions would be less than significant.

Marine activities occur when the ships come to dock at the proposed site and would result in slight increases in criteria pollutant emissions. Marine activities such as slow cruise, maneuvering and hotelling would result in CO, CO_2e, NO_X, PM_{10}, SO_2, and VOC emissions. Project-related marine emissions as shown in **Table 5.3-4**. The air basin is in attainment of all pollutants, and these impacts would be less than significant.

Table 5.3-4: Summary of Estimated Maximum Pollutant Emissions – Site Alternative 2

	Emissions (tons per year)						
Parameter	**CO**	**VOC**	**NOx**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**CO_2**
Steam Boiler	0.77	0.05	0.91	0.07	--	0.01	1094.12
Marine	0.62	0.14	5.94	0.15	--	4.42	393.57
Worker Commute	41.55	2.72	2.34	--	--	--	--
Contractor/Visitor Commute	8.87	0.58	0.50	--	--	--	--
Truck Deliveries	0.19	0.06	0.66	--	--	--	--
Fugitive Dust from Paved Roads	--	--	--	2.56	0.10	--	--
Total	**52.00**	**3.56**	**10.34**	**2.78**	**0.10**	**4.42**	**1487.69**
GCR *De minimis* Levels	100	100	100	100	N/A	100	N/A

(1) The area is considered to be in attainment for VOC, NOx, CO, PM_{10} and SO_2 however as a point of comparison for the calculated emissions, a threshold of 100 tons per year is used
(2) GCR De Minimis thresholds do not exist for $PM_{2.5}$ and CO_2

GHG emissions for Site Alternative 2 would produce less than one percent of the total GHG produced by the state of Washington, and less that one percent of the total GHG produced in the Puget Sound region. This alternative would contribute less than one percent to the GHGs from the transportation and energy supply sectors in the Puget Sound region (PSCAA 2004).

Clallam County is in attainment for all criteria pollutants and project emissions are expected to be minor. Emissions from the proposed project, combined with emissions from other planned development in the area, is not expected to lead to cumulative effects that would cause violations of NAAQS. Overall, the proposed project would result in less than significant individual or cumulative impacts to air quality.

GHG emission impacts from the proposed project are assumed to be minor, based on the 2005 Washington GHG emission estimate. However, it is not possible to evaluate whether or not the proposed project's GHG emissions combined with GHG emissions from other proposed projects in the vicinity would exacerbate global warming due to the complexity of the science of climate change and the factors that influence it.

5.3.3.3 Mitigation Measures

No mitigation measures with respect to air quality are recommended under Site Alternative 2.

5.3.4 Site Alternative 3: Bellingham

5.3.4.1 Existing Environment

The Northwest Clean Air Agency manages air quality matters in Whatcom, Island, & Skagit counties. Coastal waters within three nautical miles of a shoreline for the proposed project are part of this same air quality jurisdiction.

Weather does not cause high pollutant levels, but sometimes, under stable conditions, air pollutants may not disperse. The region has a mild maritime climate, which is typified by cool summers and mild rainy winters. Temperatures on the coast are moderate due to influences of the ocean. The annual high temperature is around 74 ºF in July and the low is around 30 ºF in January (National Climate Data Center, 2009). Mean annual temperature is 48.9°F with a maximum range of -4°F to 97°F. The coldest months of the year are December and January. The warmest months are June and July. Prevailing winds are from the southwest in the winter and from the west and southwest during the remainder of the year, and rarely exceed 20 miles per hour for extended periods. The topographical differences within the region create areas with varying air quality due to differences in dispersal of pollutants and air mixing. Proximity to low density rural and forested areas and open marine waters, and the lack of topographical barriers relative to prevailing wind patterns ensure low pollutant loading and thorough air mixing with cleaner air (City of Bellingham, 2004).

Air quality regulations specific to the State of Washington are shown in **Table 5.3-1** above. The location of Site Alternative 3 is in an area designated as in attainment for all the criteria pollutants. A General Conformity Analysis would not be required.

5.3.4.2 Environmental Consequences

There would be pile driving activities at the Bellingham site. Pile driving would be performed using a hydraulic vibratory hammer powered by a diesel engine or compressor. A diesel crane would be used as well. Other construction equipment that might be used at the site would be backhoes, front loaders and dump trucks. Emissions from the construction activities would be minor and temporary and would not reoccur. Air emissions from these activities would be insignificant.

Land-based operational activities under Site Alternative 3 would result in a slight increase in criteria pollutant emissions. Emissions resulting from the project operations are broadly categorized as follows:

- Contractor vehicle emissions (CO, CO_2e, NO_X, PM_{10}, $PM_{2.5}$, SO_2, VOC);
- Crew vehicle emissions (CO, CO_2e, NO_X, PM_{10}, $PM_{2.5}$, SO_2, VOC);
- Small and large truck delivery emissions (CO, CO_2e, NO_X, PM_{10}, $PM_{2.5}$, SO_2, VOC);
- Fugitive dust from vehicles (PM_{10}, $PM_{2.5}$); and
- Natural gas powered steam boiler emissions (CO, CO_2e, NO_X, PM_{10}, SO_2, VOC).

Employee and visitor vehicle emissions and truck emissions (including fugitive dust from paved roads) are generated from the combustion of fuels and from the entrainment of road dust during

travel along roadways on site and off site. Boiler emissions are generated from the combustion of the natural gas used to generate steam for the ships. Equipment exhaust emissions from cranes and forklifts are considered insignificant since these activities occur sporadically. Welding emissions are also considered insignificant since these activities take place infrequently.

The proposed project would result in a slight increase in criteria pollutant emissions levels. The project site is located in Whatcom County, Washington which is considered attainment for all criteria pollutants. A General Conformity analysis is not required

Project-related operational emissions shown in **Table 5.3-5** are considered less than significant.

Marine activities occur when the ships come to dock at the proposed site and would result in slight increases in criteria pollutant emissions. Marine activities such as slow cruise, maneuvering and hotelling would result in CO, CO_2e, NO_X, PM_{10}, SO_2, and VOC emissions. Project related marine emissions as shown in **Table 5.3-5** are considered less than significant.

Table 5.3-5: Summary of Estimated Maximum Pollutant Emissions – Site Alternative 3

	Emissions (tons per year)						
Parameter	**CO**	**VOC**	**NOx**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**CO_2**
Steam Boiler	0.77	0.05	0.91	0.07	--	0.01	1094.12
Marine	0.62	0.14	5.94	0.15	--	4.42	393.57
Worker Commute	41.55	2.72	2.34	--	--	--	--
Contractor/Visitor Commute	8.87	0.58	0.50	--	--	--	--
Truck Deliveries	0.19	0.06	0.66	--	--	--	--
Fugitive Dust from Paved Roads	--	--	--	2.56	0.10	--	--
Total	**52.00**	**3.56**	**10.34**	**2.78**	**0.10**	**4.42**	**1487.69**
GCR *De minimis* Levels	100	100	100	100	N/A	100	N/A

Notes:

(1) The area is considered to be in attainment for VOC, NOx, CO, PM_{10} and SO_2 however as a point of comparison for the calculated emissions, a threshold of 100 tons per year is used

(2) GCR De Minimis thresholds do not exist for $PM_{2.5}$ and CO_2

GHG emissions for Site Alternative 2 would produce less than 1% of the total GHG produced by the state of Washington.

Emissions from Site Alternative 3 combined with other projects in the area could potentially have a cumulative impact on air quality. However, since Whatcom County is considered in attainment for all criteria pollutants, the emissions from the proposed project when combined with emissions from other planned development in the area would not likely lead to violations of NAAQS, as project emissions are minimal. Therefore, the proposed action at Site Alternative 3 would have a less than significant cumulative air quality impact.

GHG emission impacts from the proposed project are assumed to be minor, based on the 2005 Washington GHG emission estimate. However, it is not possible to evaluate whether or not the proposed project's GHG emissions combined with GHG emissions from other proposed projects in the vicinity would exacerbate global warming due to the complexity of the science of climate change and the factors that influence it.

5.3.4.3 Mitigation Measures

No mitigation measures with respect to air quality are recommended under Site Alternative 3.

5.3.5 Site Alternative 4: Newport

5.3.5.1 Existing Environment

The air quality in the region is influenced by pollutant emissions and by the weather, particularly when temperature inversions persist. In general, cold, stagnant winter weather can result in elevated $PM_{2.5}$ levels and hot, stagnant summer temperatures result in elevated ground level ozone (ODEQ, 2007). The average temperature in the region is 52 °F, with a range of 60-72 °F during the summer and a range of 42-52 °F during the winter. The average annual rainfall in the region is 68 inches (Greater Newport Chamber of Commerce, 2009). Rainfall tends to occur more in the winter than in the summer.

The OAAQS, provided by ODEQ, correspond to the Federal standards shown in **Table 5.3-1**. The region in which Site Alternative 4 is located has been designated as in attainment for all the criteria pollutants; overall air quality is good. A General Conformity Analysis is not required.

5.3.5.2 Environmental Consequences

Two existing piers installed in the 1970s would be demolished and the installation of a new pier initiated, requiring pile driving activities. Dredging would also be performed at the proposed site using a hydraulically powered cutter head dredge to ensure adequate berth depths. Pile driving and pile removal would be performed using a hydraulic vibratory hammer powered by a diesel engine or compressor. A diesel crane would also be used. Other construction equipment may include backhoes, front loaders and dump trucks. Emissions from these construction activities would be temporary and occur only once. Therefore, the emissions from these activities are considered temporary and insignificant.

Land-based operational activities under Site Alternative 4 would result in slight increases in criteria pollutant emissions. Emissions resulting from the project operations are broadly categorized as follows:

- Contractor vehicle emissions (CO, CO_2e, NO_X, PM_{10}, $PM_{2.5}$, SO_2, VOC);

- Crew vehicle emissions (CO, CO_2e, NO_X, PM_{10}, $PM_{2.5}$, SO_2, VOC);
- Small and large truck delivery emissions (CO, CO_2e, NO_X, PM_{10}, $PM_{2.5}$, SO_2, VOC);
- Fugitive dust from vehicles (PM_{10}, $PM_{2.5}$); and
- Natural gas powered steam boiler emissions (CO, CO_2e, NO_X, PM_{10}, SO_2, VOC).

Employee and visitor vehicle emissions and truck emissions (including fugitive dust from paved roads) are generated from the combustion of fuels and from the entrainment of road dust during travel along roadways on site and off site. Boiler emissions are generated from the combustion of the natural gas used to generate steam for the ships. Equipment exhaust emissions from cranes and forklifts are considered insignificant since these activities occur sporadically. Welding emissions are also considered insignificant since these activities take place infrequently.

The proposed project would result in a slight increase in criteria pollutant emissions levels. The project site is located in Lincoln County, Oregon which is considered attainment for all criteria pollutants. Therefore, a General Conformity analysis does not need to be performed. Project related operational emissions shown in **Table 5.3-6** are considered less than significant.

Marine activities occur when the ships operate at or near the proposed site and would result in slight increases in criteria pollutant emissions. Marine activities such as slow cruise, maneuvering and hotelling would result in CO, CO_2e, NO_X, PM_{10}, SO_2, and VOC emissions. Project related marine emissions as shown in **Table 5.3-6** are considered less than significant.

Table 5.3-6: Summary of Estimated Maximum Pollutant Emissions – Site Alternative 4

	Emissions (tons per year)						
Parameter	**CO**	**VOC**	**NOx**	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**CO_2**
Steam Boiler	0.77	0.05	0.91	0.07	--	0.01	1094.12
Marine	0.62	0.14	5.94	0.15	--	4.42	393.57
Worker Commute	68.87	5.52	4.23	--	--	--	--
Contractor Commute	14.70	1.18	0.90	--	--	--	--
Truck Deliveries	0.55	0.16	1.65	--	--	--	--
Fugitive Dust from Paved Roads	--	--	--	2.60	0.10	--	--
Total	**85.50**	**7.05**	**13.63**	**2.82**	**0.10**	**4.42**	**1487.69**
GCR *De minimis* Levels	100	100	100	100	N/A	N/A	N/A

Notes:

(1) The area is considered to be in attainment for VOC, NOx, CO, PM_{10} and SO_2 however as a point of comparison for the calculated emissions, a threshold of 100 tons per year is used

(2) GCR De Minimis thresholds do not exist for $PM_{2.5}$ and CO_2

Emissions from the proposed action at Site Alternative 4, combined with other projects in the area, could potentially have a cumulative impact on air quality. However, since Lincoln County

is considered in attainment for all criteria pollutants, the emissions from the proposed action when combined with emissions from other planned development in the area would not lead to violations of NAAQS. Therefore, the proposed project would pose a less than significant cumulative air quality impact.

GHG emission impacts from the proposed project are assumed to be minor, based on the 2004 Oregon GHG emission estimate.

5.3.5.3 Mitigation Measures

No mitigation measures with respect to air quality are recommended under Site Alternative 4.

5.4 WATER RESOURCES

The effects of the proposed action on water resources at a given Site Alternative were considered based on professional practices and regulatory standards. Depending on the duration and intensity of the effect, the following effects may be considered significant:

- Substantial alteration of existing drainage patterns
- Substantial increase in surface water runoff
- Creation of off-site drainage or flooding hazards
- Degradation of water quality in excess of regulatory water quality criteria:
  - Surface water quality criteria in Washington State (codified in Washington Administrative Code [WAC] 173-201A-240)
  - Groundwater quality criteria in Washington State (codified in WAC 173-200-040)
  - Surface water quality criteria in Oregon State (codified in Oregon Administrative Rule [OAR] 340-041)
  - Groundwater quality criteria in Oregon State (codified in OAR 340-040)

An impact is considered to be long-term if it could persist for a year or more. An impact is considered to be short-term if it is transient and capable of being absorbed by the ambient environment. Any potential impacts that are not explicitly described in this assessment are considered to be not significant.

5.4.1 No-Action Alternative

5.4.1.1 Existing Environment

The No-Action Alternative assumes continuation of upland activities at the existing MOC-P site on Lake Union, and continuation of water-based activities (ship berthing, etc) at various temporary locations around Lake Union and the Seattle area, as described in Section 4.3 above. The existing environment of the Lake Union area in relation to water resources is described more fully in Section 5.4.2.1 below.

5.4.1.2 Environmental Consequences

The No-Action Alternative for the proposed action would not impact existing drainage patterns or surface water runoff quantities, and would not create off-site drainage or flooding issues. With respect to water quality, if the site is currently a source for the observed petroleum sheen, this impact would continue under the No-Action Alternative, as current site conditions would remain unchanged. If treated wood pilings are present beneath the existing docks, these may be affecting the quality of Lake Union, as treatment chemicals (e.g., creosote, arsenic, chromium, copper) may leach from the wood. This potential impact would continue under the No-Action Alternative, as current site conditions would remain unchanged.

5.4.1.3 Mitigation Measures

No mitigation measures are recommended with respect to water resources for the No-Action Alternative.

5.4.2 Site Alternative 1: Lake Union

5.4.2.1 Existing Environment

Seattle, Washington receives approximately 37 inches of rain and 11 inches of snowfall per year on average, and precipitation falls 210 days a year on average (National Climate Data Center, 2009).

The existing facility is located on the eastern shoreline of Lake Union on a flat, filled area at the base of a steep slope rising to 200 feet above MSL. The eastern upland side of the site is approximately 47 feet above MSL, while the shoreline along Lake Union is approximately 25 feet above MSL. Lake Union is the closest surface water feature, and no other natural surface water features are located within or near the site. Lake Union is connected to Lake Washington to the northeast via the Montlake Cut, and to Puget Sound to the northwest through the Hiram M. Chittenden Locks that prevent mixing of marine waters into Lake Union. Lake Union has been impacted historically by the industrial and municipal activities along its shorelines, including

road contaminants, pesticides, and sewage. The quality of the lake improved when the City of Seattle and King County began installing combined sewer overflow systems beginning in the 1970s. Currently the lake is considered to have moderate water quality (King County, 2009c).

Surface water drainage from the site is primarily captured at stormwater catch basins located in paved areas that flow to Lake Union. The site is not considered a substantial source of infiltration and groundwater recharge because it is paved and has a storm water catchment system. Oil sorbent socks and/or filters are reportedly located in the catch basins to mitigate impacts to Lake Union by sediments and other upland contaminants (e.g., automotive and motor fluids). These storm drain discharges are considered to pose a moderate risk of contamination to the lake (GeoEngineers, 2009).

A slight petroleum sheen has been observed previously on the surface of Lake Union in isolated areas near the site's shoreline (GeoEngineers, 2009). The source of the sheen was not determined, but it may be caused by fire-damaged treated timbers in the water, stormwater runoff from upland areas, from off-site sources that have floated on the Lake Union surface to the shoreline, or a combination of the above.

5.4.2.2 Environmental Consequences

The proposed upland improvements to the subject site are not expected to substantially affect either surface water features or surface water drainage in and around the site. The site is almost entirely paved, and thus groundwater infiltration and groundwater discharge from the site into Lake Union is anticipated to be minimal. This condition would not change under Site Alternative 1. Surface water is captured and controlled with existing catch basins. The proposed action at Site Alternative 1 may result in better maintenance of the catchbasins than under current conditions, which would improve the quality of the water in Lake Union.

The amount of ground surface covered with pavement and structures is not expected to change with the proposed upgrades to the site, and thus runoff, erosion, and sediment transport to Lake Union is not anticipated to change. The proposed action includes partial removal and repair of treated wood pilings. The use of non-toxic replacement materials would tend to improve the long-term water quality in Lake Union to a small degree. During construction, the replacement of sections of pilings could temporarily degrade water quality as sediments are disturbed and resuspended during installation of the new piles.

The proposed action includes two new buildings and replacement of damaged asphalt pier surface. These features are not expected to have any long-term significant effect on water quality. Release of soil or construction material during construction activities could cause short-term impacts to the quality of Lake Union.

5.4.2.3 Mitigation Measures

Impacts to water quality would be minimized by implementing measures that would result in adherence to the following regulations: water quality restrictions imposed by the WDOE (Chapter 173-201A WAC), and waste material disposal per WAC 220-110-070.

In addition, if the proposed action would disturb an area greater than one acre, a National Pollutant Discharge Elimination System (NPDES) Phase II Statewide General Construction Permit would be required. Site management under the permit would include the application of best management practices (BMPs) for sediment and stormwater control (e.g., sediment traps, barriers, covers, or other methods) during construction and operation of the MOC-P facilities. Surface drainage control should be included in the site development plans to minimize surface runoff to the harbor once the development is completed.

Example measures, or their equivalent, for site preparation and development activities could include:

- Regular, standard maintenance of catch basin socks and filters, as well as periodic removal and off-site disposal of catch basin sediments, should be conducted during the construction period.
- Demolition and construction materials should not be stored where high tides, wave action, or upland runoff could cause materials to enter surface waters. Excess or waste materials should not be disposed of or abandoned waterward of OHW or allowed to enter waters of the state.
- Waste materials, including hazardous waste and treated wood waste, should be disposed of in a landfill that meets relevant federal, state and local regulations.
- A containment boom surrounding the work area should be used during creosote-treated pile repair work to contain and collect any floating debris and sheen, provided that the boom does not interfere with operations. Action plans should include retrieval of any debris generated during construction and proper disposal of the debris at an approved upland location.
- Oil-absorbent materials should be present on site and be used in the event of a spill or if any oil product is observed in the water.
- Removed piles, stubs, and associated sediments (if any) should be contained on a barge either in a container or a storage area contained within a row of hay or straw bales or filter fabric around the perimeter of the barge.

- Any new timber piling should be non-creosote-treated piling such as steel or Ammoniacal Copper Zinc Arsenate (ACZA)-treated wood piling. ACZA-treated wood should be treated using the current American Wood Preservers' Association Standards.
- Wet concrete should not come in contact with state waters. Water inside forms should be drained to the water elevation outside the form before concrete is poured.
- Whenever activities that generate sawdust, drill tailings, or wood chips from treated timbers are conducted, tarps or other containment material should be used to prevent debris from entering the water. If tarps cannot be used (because of the location or type of structure), a containment boom should be placed around the work area to capture debris and cuttings.
- Pilings that break or already broken below the waterline should be removed with a clamshell bucket. To minimize disturbance to bottom sediments and splintering of pilings, the contractor should use the minimum size bucket required to pull out pilings based on pile depth and substrate. The clamshell bucket should be emptied of pilings and debris on a contained barge before it is lowered into the water. If the bucket contains only sediment, the bucket should remain closed and be lowered to the mudline and opened to redeposit the sediment.

Example, or equivalent, measures for operation and maintenance activities under the proposed action at Site Alternative 1 could include:

- Regular, standard maintenance of catch basin socks and filters, as well as periodic removal and off-site disposal of catch basin sediments, should be conducted during long-term operation of MOC-P.
- Materials should not be stored where high tides, wave action, or upland runoff could cause materials to enter surface waters. Excess or waste materials should not be disposed of or abandoned waterward of OHW or allowed to enter waters of the state.
- Waste materials, including hazardous waste and treated wood waste, should be disposed of in a landfill that meets relevant federal, state and local regulations.
- Whenever activities such as sandblasting or painting are conducted over or near water, tarps or other containment material should be used to prevent materials or debris from entering the water. If tarps cannot be used (because of the location or type of activity), a containment boom should be placed around the work area to capture debris and cuttings. Any floating debris should be retrieved, and disposed of at an upland disposal site.

It is expected that the lessor will satisfy appropriate mitigation measures by following the usual permitting and regulatory requirements.

5.4.3 Site Alternative 2: Port Angeles

5.4.3.1 Existing Environment

Port Angeles, Washington receives approximately 26 inches of rain and 4 inches of snowfall per year on average, and precipitation falls 222 days a year on average (National Climate Data Center, 2009).

The site is located on the south shoreline of Port Angeles Harbor on a flat, partially filled area at the base of a steep slope on the northern edge of the Olympic Mountain foothills. Port Angeles Harbor opens to the east onto the Strait of Juan de Fuca to the west and Puget Sound to the east. Besides the existing maintenance shop and parking area, the site is unpaved. There are four catch basins within the former log yard area, proposed for NOAA facilities, which capture local surface drainage and conveys it underground into harbor waters. The area west of the existing maintenance building is paved, and surface water from the rest of the site flows to the harbor as sheet flow. The site is not considered a substantial source of infiltration and groundwater recharge.

The nearest surface water feature besides the harbor is Tumwater Creek, which is channelized in an approximately 200-foot long covered culvert along the eastern site boundary. Tumwater Creek drains to the north, carrying runoff from the Olympic Mountains from its own independent watershed into the harbor as part of the Elwha-Morse Watershed (Clallam County 2009). Tumwater Creek water quality has been noted as impaired and compromised due to various types of pollution, both bacteriological and chemical (Clallam County Streamkeepers 2009). Creek water has been previously affected by petroleum released from a stormwater retention pond that discharged into Tumwater Creek from a commercial refueling station on Tumwater Road (Ecology & Environment, Inc., 2008). A description of habitat associated with Tumwater Creek is provided in Section 5.7.3.1 of this EA.

The proposed action would improve the quality of water resources in and around the site. Increasing the paved surface area would decrease the potential for sediment and chemical transport from existing soil conditions to the harbor by surface runoff, thus improving the quality of both harbor water and sediments. The increased impervious surface area also would decrease groundwater infiltration. The groundwater gradient is inferred to be to the north; thus, less infiltration would result in reduced groundwater discharge from the site into Port Angeles Harbor. This likely would improve the water quality in the harbor adjacent to the site, given the industrial history of the site.

Upland construction activities proposed under Site Alternative 2 have the potential to temporarily degrade nearshore harbor surface water quality due to discharges of disturbed soils and other construction-related materials. In particular, eastern areas of the site have been identified as having petroleum hydrocarbon-impacted soils (see Section 5.17.3). The release of remnant petroleum-influenced soils to the harbor would impact water quality. Installation of new pilings could potentially degrade water quality temporarily when sediments are disturbed and resuspended.

5.4.3.2 Mitigation Measures

Impacts to water quality would be minimized by implementing measures that would result in adherence to the following regulations: water quality restrictions imposed by the WDOE (Chapter 173-201A WAC), and waste material disposal per WAC 220-110-070. Example measures for Site Alternative 2 would be the same as described in Section 5.4.2.3.

Because the proposed action would disturb an area greater than one acre, a NPDES Phase II Statewide General Construction Permit would be required. Site management under the permit would include the application of BMPs for sediment and stormwater control (e.g., sediment traps, barriers, covers, or other methods) during construction and operation of the MOC-P facilities. Surface drainage control should be included in the site development plans to minimize surface runoff to the harbor once the development is completed.

It is expected that the lessor will satisfy appropriate mitigation measures by following the usual permitting and regulatory requirements.

5.4.4 Site Alternative 3: Bellingham

5.4.4.1 Existing Environment

Bellingham, Washington receives approximately 39 inches of rain and 5 inches of snowfall per year on average, and precipitation falls 197 days a year on average (National Climate Data Center, 2009).

Site Alternative 3 is located adjacent to the Whatcom Waterway, an approximately one-mile-long artificial channel that leads from the mouth of Whatcom Creek to Bellingham Bay, which opens onto Puget Sound. The site is at the southwest end of the waterway, approximately one mile from Whatcom Creek, which drains from Lake Whatcom in the hills to the east of Bellingham. The site is on a flat, filled area, approximately one-half mile from the base of a steep slope which rises to approximately 200 feet above MSL.

The site predominantly consists of impervious surfaces, with two buildings and asphalt or concrete pavement and a concrete seawall. A small gravel area exists on the east-central side of

the site to the south of Warehouse One. Catch basins throughout the subject site capture surface water runoff, which is discharged to the waterway.

5.4.4.2 Environmental Consequences

The proposed action, once constructed, would have no adverse impacts on water resources. The site is almost entirely paved, and thus groundwater infiltration and groundwater discharge from the site into the waterway is anticipated to be minimal. This condition would not change with the proposed development. Surface water is currently captured and controlled with existing catch basins. The proposed action would provide improved maintenance of the surface runoff utilities. The potential exists to marginally improve water quality in Whatcom Waterway near the site.

Upland construction activities have the potential to temporarily degrade nearshore surface water quality in Whatcom Waterway, due to discharges of sediment and other construction-related materials. Removal of any treated wood pilings and replacement of the existing timber bulkhead with non-toxic materials could marginally improve the long-term water quality in the waterway. Installation of dolphins, other new pilings and the replacement bulkhead would result in short-term degradation of water quality when sediments are disturbed and resuspended.

5.4.4.3 Mitigation Measures

Impacts to water quality would be minimized by implementing measures that would result in adherence to the following regulations: water quality restrictions imposed by the WDOE (Chapter 173-201A WAC), and waste material disposal per WAC 220-110-070. Example measures for Site Alternative 3 would be the same as described in Section 5.4.2.3.

Because the proposed action would disturb an area greater than one acre, a NPDES Phase II Statewide General Construction Permit would be required. Site improvements would include BMPs for sediment and stormwater control (e.g., sediment traps, barriers, covers, or other methods) both during construction and during normal site use following development. Surface drainage control should be included in the site development plans, which would minimize surface runoff to the waterway once the development is completed.

It is expected that the lessor will satisfy appropriate mitigation measures by following the usual permitting and regulatory requirements.

5.4.5 Site Alternative 4: Newport

5.4.5.1 Existing Environment

Newport, Oregon receives approximately 68 inches of rain and one inch of snowfall per year on average, and precipitation falls 209 days a year on average (National Climate Data Center, 2009).

Site Alternative 4 is located at the head of a small flat peninsula jutting out into Yaquina Bay approximately two miles from the harbor entrance. The site is in the estuary of the Yaquina River watershed, and the water in this part of the bay is dominantly marine in nature (Brown and Ozretich, 2009). No permanent natural surface water features except for the bay are located on or near the site. The site is improved with a fish farm complex (not in operation), portions of which are currently used as a cherry processing facility and a fish buying operation. On or adjacent to the subject are 25 artificially constructed ponds formerly used for fish farm operations. Surface water that does not infiltrate down through unpaved surface areas enters the bay as uncontrolled surface flow.

5.4.5.2 Environmental Consequences

The proposed action would increase the impervious surface area and thus decrease groundwater infiltration. The groundwater gradient is to the north and so it is anticipated that less infiltration would result in reduced groundwater discharge from the site into Yaquina Bay. This would tend to improve the water quality in Yaquina Bay adjacent to the site, given the history of the site.

Upland construction activities could have the potential to temporarily degrade nearshore harbor surface water quality, due to discharges of sediment and other construction-related materials. The proposed redevelopment plan calls for removal of the existing pilings and replacement with new concrete piles. Removal of treated wood would tend to improve the long-term water quality within the waterway, although the new piling installation and dredging could temporarily degrade water quality as sediments are disturbed and resuspended.

5.4.5.3 Mitigation Measures

Impacts to water quality would be minimized by implementing measures that would result in adherence to the water quality standards imposed by ODEQ (OAR 340-041). Example measures for Site Alternative 4 would be the same as described in Section 5.4.2.3.

Because the proposed action would disturb an area greater than one acre, a NPDES Phase II Statewide General Construction Permit would be required. Site improvements would include BMPs for sediment and stormwater control (e.g., sediment traps, barriers, covers, or other methods) both during construction and during normal site use following development. Surface

drainage control should be included in the site development plans, which would minimize surface runoff to the harbor once the development is completed.

It is expected that the lessor will satisfy appropriate mitigation measures by following the usual permitting and regulatory requirements.

5.5 RECREATIONAL RESOURCES

National, state and regional recreational resources may include established parks, trails, camping, boating and touring facilities potentially affected by the proposed action at the Site Alternative. Local recreational resources may include city, county and tribal owned facilities and properties, or locations informally established for recreational activities.

5.5.1 No-Action Alternative

5.5.1.1 Existing Environment

The No-Action Alternative assumes continuation of upland activities at the existing MOC-P site on Lake Union, and continuation of water-based activities (ship berthing, etc.) at various temporary locations around Lake Union and the Seattle area, as described in Section 4.3 above. The existing environment of the Lake Union area in relation to recreational resources is described more fully in Section 5.5.2.1 below.

5.5.1.2 Environmental Consequences

Implementation of the No-Action Alternative would have no impact on regional or local recreational resources, as there would be no change to the existing state of the site.

5.5.1.3 Mitigation Measures

No mitigation measures with respect to recreational resources would be required for the No-Action Alternative.

5.5.2 Site Alternative 1: Lake Union

5.5.2.1 Existing Environment

No recreation facilities are presently located on the site and there are no national, state or regional recreational resources in the vicinity of the site.

The City of Seattle owns a variety of recreational parks within one mile of the site (City of Seattle, 2009b) including the following:

- Terry Pettus Park is located on the corner of East Newton Street and Fairview Avenue East, approximately quarter of a mile north of the site. The park is approximately 0.9 acres in size, and includes shoreline access and a public boat launch (hand carry). Park amenities also include fishing and views of Lake Union.
- The I-5 Colonnade Park is located beneath the Interstate freeway, less than 1,000 feet to the east of the site. The park is approximately 7.5 acres, and connects the Eastlake and Capitol Hill neighborhoods with pedestrian walkways and bicycle commuter trails. The park includes an off-leash area for dogs and a mountain bike trail. Volunteer Park and the Lake View Cemetery are located to the east of I-5 Colonnade Park.
- Gas Works Park is located at the northern end of Lake Union, approximately 3,500 feet northwest across the lake from the site. The park is over 19 acres and contains play areas, picnic facilities, open space and waterfront access, as well as a historical landmark and views of Seattle downtown.
- Lake Union Park is located at the southern end of Lake Union, approximately 3,500 feet southwest of the site. The park is approximately 12 acres in size, and contains the Naval Reserve Building and Center for Wooden Boats. The Center for Wooden Boats operates year-round sail and rowboat rentals, sailing lessons and other maritime related classes, and also hosts an annual Wooden Boat Festival in July and several other public events throughout the year.

Public schools also provide recreational facilities such as ball fields, basketball courts, open space areas and other recreational amenities. The closest schools to the site are: Middle College Alternative High School (approximately 1,800 feet to the southeast) and Lowell Elementary School (approximately 4,500 feet southeast).

Several dozen houseboats are moored on the shore of Lake Union, immediately to the north of the site. While privately owned, these houseboats are a common attraction for people kayaking within Lake Union. There are kayak rental facilities on the eastern and southern shores of Lake Union.

There is limited public shoreline access in the immediate vicinity of the site, due to industrial and marine-based facilities. However several small “street-end” parks and boat ramps are available at regular intervals around the lake. The City of Seattle plans to create a multi-use trail, the Cheshiahud Lake Union Loop, around the entire lake, connecting new and existing waterfront parks. The trail would pass along Fairview Avenue, immediately adjacent to the site.

Lake Union is not a major recreational fishing area, although the lake and canal system are the only migration route for the salmon in the Lake Washington, Cedar River, and Lake Sammamish drainages (King County, 2009b).

5.5.2.2 Environmental Consequences

Implementation of the proposed action at Site Alternative 1 would have negligible effects on regional or local recreational resources. Recreational resources are located at such a distance from the site, and the proposed action is similar to historical uses at the site, therefore users would not likely be affected by the proposed action.

With respect to informal recreational opportunities such as kayaks visiting the houseboats to the north of the site, the proposed alternative would have negligible to minor effects on this resource. While kayakers may be aware of the proposed alternative, once constructed, the new facilities are likely to enhance the amenity of the area compared with the existing fire damaged terminal. During construction, there may be slight, short-term effects on the amenity of the lake area due to construction traffic, noise and visual change; however it is unlikely that users' experiences would be disrupted to the extent that the values could not be enjoyed. The location and frequency of vessel operations from the site would not have an adverse effect on existing informal recreational opportunities.

The proposed alternative would have negligible effects on recreational fishing activities within Lake Union. The site's historical operation as NOAA's MOC-P homeport, and the Lake Union Drydock facility to the south, mean that little to no recreational fishing is likely to take place in close proximity to the site. Such activities further out in the lake would have no perceptible effects from the proposed action.

The proposed action at this Site Alternative would have negligible effects on public shoreline access, as there would be no change to the current situation of no public access to the shoreline in the vicinity of the site.

5.5.2.3 Mitigation Measures

No mitigation measures with respect to recreational resources would be required for the proposed action at Site Alternative 1.

5.5.3 Site Alternative 2: Port Angeles

5.5.3.1 Existing Environment

No recreation facilities are presently located on the site. The Olympic National Park boundary is approximately five miles south of Port Angeles; however the park's visitor center is located

within the city itself, on Hurricane Ridge Road, approximately two miles southeast of the site. The park is over 900,000 acres, and contains the 7,980-feet tall Mount Olympus. The Olympic Coast National Marine Sanctuary is located along the western coast of the Olympic Peninsula, approximately 60 miles west of Port Angeles. The sanctuary's visitor center, the Olympic Coast Discovery Center, is located within Port Angeles, approximately 3,500 feet east of the site.

The nearest State Park to the site is Sequim Bay State Park, approximately 18 miles east of Port Angeles. The park is a 92-acre marine camping park with nearly 5,000 feet of saltwater coast, just inside Puget Sound on the Olympic Peninsula.

The City of Port Angeles owns a variety of recreational resources within the city limits, including: eleven neighborhood parks, seven facilities for organized sports, eight view points and several other community facilities (City of Port Angeles, 2009c). The following recreational facilities are located in proximity to the site:

- The Waterfront Trail follows the waterfront of the Port Angeles harbor, extending 6.5 miles from the Coast Guard Station entrance gate on Ediz Hook to just west of the old Rayonier mill site before connecting to the Olympic Discovery Trail at Morse Creek. The trail is used for walking, hiking, jogging, and biking. The trail route passes along Marine Drive immediately adjacent to the site.
- Valley Creek Estuary park is located approximately 2,000 feet southeast of the site. The park contains a pavilion, viewing tower, and a Friendship Bridge symbolizing Port Angeles' relationship with the city of Mutsu, Japan. The park also provides access to the beach, and the Waterfront Trail.

Public schools provide recreational facilities such as ball fields, basketball courts, open space areas and other recreational amenities. The closest school is Lincoln High School, approximately 3,000 feet southwest of the site.

The marina immediately west of the site contains berths for recreational and commercial vessels, a yacht club, and also has kayak and boat rental facilities.

Public shoreline access along Port Angeles harbor has been historically restricted by navigation and industrial use activities. Although the Waterfront Trail provides a recreational link around the harbor, the trail is often several hundred yards from the waterfront, with limited access to the water/beach.

The Port Angeles area offers a variety of sport fishing opportunities, including deep sea, lake, stream, and river. Shellfish harvesting and crabbing for Dungeness are also very popular recreational activities. The nearby Strait of Juan de Fuca contains halibut and salmon. The area also offers fantastic river fishing in the nearby Dungeness, Elwha, Bogachiel and Sol Duc

Rivers. The Lower Elwha Klallam Tribe undertakes subsistence-level shellfish gathering in the vicinity of the Port Angeles Harbor.

5.5.3.2 Environmental Consequences

Implementation of the proposed action at Site Alternative 2 would have negligible effects on regional or local recreational resources. The majority of recreational resources are located at such a distance from the site, that users would not likely be affected by the proposed action. While the Waterfront Trail passes adjacent to the site, it is considered that once constructed, the new facilities are likely to enhance the amenity of the area, compared with the recent log storage operations and current vacant site, and therefore trail users' experiences would be positively affected. During construction, there may be slight, short-term effects on the amenity of the Waterfront Trail due to construction traffic, noise and visual change; however it is unlikely that users' experiences would be disrupted to the extent that the values could not be enjoyed.

The location and frequency of vessel operations from the site would not have an adverse effect on existing water-based recreational opportunities, such as recreational fishing and shellfish gathering activities within Port Angeles harbor. The immediate vicinity of the site has until recently been used as a log booming area, and adjacent areas are currently used by vessels accessing the existing Terminal 1 and 3 facilities, therefore little to no recreational fishing or gathering is likely to take place in close proximity to the site. Such activities further out in the harbor would have no perceptible effects from the proposed action.

The proposed action at this Site Alternative would have negligible effects on public shoreline access, as there would be no change to the current situation of no public access to the shoreline in the vicinity of the site.

5.5.3.3 Mitigation Measures

No mitigation measures with respect to recreational resources would be required for the proposed action at Site Alternative 2.

5.5.4 Site Alternative 3: Bellingham

5.5.4.1 Existing Environment

The nearest State Park to the site is Larrabee State Park, located in Chuckabee, approximately six miles to the south. The park is a 2,683-acre camping park with more than 8,000 feet of saltwater shoreline, two freshwater lakes, coves and tidelands. A variety of non-motorized, multiple-use trails wind through the park. Washington State also owns a small open space area at Silver

Beach, on the northern shores of Lake Whatcom. There are no national recreational facilities within 20 miles of the site.

The City of Bellingham owns a variety of recreational parks within the city limits, including 10 community parks, 23 neighborhood parks, 40 open space areas, 3 trails, 10 combined open space/trail areas and 17 special use areas (City of Bellingham, 2008). The following recreational facilities are located within one mile of the site:

- The Maritime Heritage Center Park is a community park, located at the northern end of Whatcom Waterway, approximately 3,000 feet north of the site. The Park is approximately 11.2 acres in area, and contains an environmental education center, amphitheater, playground facilities, and restrooms, as well as more than 1.3 miles of trails. The park is linked to Whatcom Falls Park and Bloedel Donovan Park (to the northeast) by the 3-mile long Whatcom Creek Trail.
- Another community park, Boulevard Park, is located approximately 5,000 feet to the southwest of the Bellingham Shipping Terminal. The park is more than 20 acres in area, and includes beach frontage, waterfront trails including an overwater boardwalk, a hand boat launch, playgrounds, and restrooms.
- The Sehome Hill Arboretum is approximately 2,500 feet to the west of the site, and comprises 160 acres of open space above the West Washington University campus. The arboretum contains a network of trails, totaling 3.6 miles in length.
- Laurel Park and Forest and Cedar Park are both 2-acre neighborhood parks, located approximately 3,000 feet west of, and 2,000 feet southwest of, the site respectively.
- The South Bay Greenway and Trail is a combined open space/trail, linking downtown Bellingham with the Fairhaven District to the south. The trail is approximately 3.5 miles long, passing along the south of Cornwall Avenue, through Boulevard Park, and terminating at the Fairhaven Village Green.

Public schools provide recreational facilities such as ball fields, basketball courts, open space areas and other recreational amenities. The closest schools to the site are: Bellingham High School (1 mile to the northeast), Carl Cozier Elementary (1.2 miles to the east), and Sehome High School (1.2 miles to the southeast). In addition, West Washington University, approximately 300 feet southeast of the site, contains playing fields, sports courts and other recreational facilities.

No formal recreation facilities are presently located on or adjacent to the site; however, informal recreational use does occur at the southern end of Cornwall Avenue where a small pocket beach is located. This area is frequently used as a launching point for kayaks.

Public shoreline access along the Inner Whatcom Waterway has been historically restricted by navigation and industrial use activities. However, the South Bay Greenway and Trail provides shoreline access to the south of the Site. The City plans to further develop its shoreline trail system, including the proposed New Whatcom Redevelopment project, which would provide shoreline access along Whatcom Waterway north of the site.

Bellingham Bay and the associated streams and rivers contain a wide variety of sport fishing and harvesting opportunities, including salmon, other fish, crab, and clams. Each of these has different harvest seasons. Recreational and/or subsistence tribal shellfish areas are found in and around Portage Bay and Portage Island, and along the Lummi Peninsula, approximately five miles west of the site. Primary species harvested by the Lummi Nation include Pacific oysters, native littleneck clams, and Manila clams.

Sport salmon fishing is generally restricted to an area south of Post Point at Chuckanut Bay (approximately 2.3 miles southwest of the site). The most lucrative fisheries in Bellingham Bay are the chinook, coho, and chum salmon. Although there are no targeted fisheries for pink and sockeye salmon, these species are incidentally caught in the Bay. Sockeye salmon are also caught incidentally in the Nooksack River fisheries (RETEK Group, 2007).

Several groundfish species occur in Bellingham Bay and are harvested by Tribes and other users of the Bay. These economically and ecologically important species include, but are not limited to, Pacific cod, rockfish, ling cod, rock sole, English sole, and starry flounder. Except for inner Bellingham Bay, the entire bottom of the Bay is considered part of the recreational fishery for marine fisheries resources (CH2M Hill, 1984).

5.5.4.2 Environmental Consequences

Implementation of the proposed action at Site Alternative 3 would have negligible effects on regional or local recreational resources. Recreational resources are located at such a distance from the site, that users would not likely be affected by the proposed action. The South Bay Greenway and Trail passes along the southeastern side of Cornwall Avenue approximately 900 feet from this Site Alternative. The trail in this location is heavily vegetated, therefore the proposed action would not affect existing users or their experience of this recreational resource.

With respect to informal recreational opportunities such as kayak launching from the beach at the southern end of Cornwall Avenue, the proposed alternative would have negligible to minor effects on this resource. While beach users and kayakers may be aware of the proposed alternative, once constructed, the new facilities are likely to enhance the amenity of the area compared with the existing unused terminal, and therefore increase users' experiences at the beach. During construction, there may be slight, short-term effects on the amenity of the beach

due to construction traffic, noise and visual change; however it is unlikely that users' experiences at the beach would be disrupted to the extent that the values could not be enjoyed. The location and frequency of vessel operations from the site would not have an adverse effect on existing informal recreational opportunities.

The proposed alternative would have negligible effects on recreational fishing and shellfish gathering activities within Bellingham Bay. The immediate vicinity of the site is currently used a shipping channel, therefore little to no recreational fishing or gathering is likely to take place in close proximity to the site. Such activities further out in the bay would have no perceptible effects from the proposed action.

The proposed action at this Site Alternative would have negligible effects on public shoreline access, as there would be no change to the current situation of no public access to the shoreline in the vicinity of the site.

5.5.4.3 Mitigation Measures

No mitigation measures with respect to recreational resources would be required for the proposed action at Site Alternative 3.

5.5.5 Site Alternative 4: Newport

5.5.5.1 Existing Environment

Yaquina Bay State Recreation Site is located at the northern head of Yaquina Bay (approximately 3,000 feet west of the site). Attractions include a historic lighthouse, as well as picnic facilities, walking trails, beach access and fishing.

South Beach State Park is located approximately one mile to the south-southwest of the site. The park and surrounding areas offer a variety of recreational opportunities, including: day use areas, camping, hiking, bird watching, cycle trails, kayak tours, fishing, crabbing, boating, windsurfing and beachcombing. Adjacent to South Beach State Park, South Jetty offers horse access to the beach, fishing, clamming, surfing, scuba diving and windsurfing.

Other State recreation facilities in the vicinity of Newport include the Agate Beach State Recreation Site (approximately two miles north), Lost Creek State Recreation Site (five miles south) and Ona Beach State Park (seven miles south). The closest national recreational resource is the Drift Creek Wilderness Area of the Suislaw National Forest, approximately six miles southeast of the site. The Mike Miller County Park Educational Trail is located approximately 1.5 miles south of the site.

The City of Newport owns a variety of recreational facilities within the city limits (City of Newport, 2009a), none of which are south of Yaquina Bay. Similarly, there are no public schools (and associated recreational resources) within the South Beach area of Newport.

The Port of Newport Marina is located approximately 800 feet west of the site, and the associated RV Park is located approximately 600 feet south of the site. The marina mainly accommodates recreational vessels, and provides facilities such as charter, whale watching and sports fishing cruises, small boat rentals, public boat launch and associated trailer parking, a public fishing pier and public picnic bunkers.

Other nearby attractions include:

- The Mark O. Hatfield Marine Science Center, located immediately to the east of the site. The center contains OSU exhibits on marine life and the coastal environment.
- The Oregon Coast Aquarium, located approximately 3,000 feet south of the site. The aquarium contains marine creatures and exhibits which showcase the beauty and diversity of sea life along the Oregon coast.

No park and recreation facilities are presently located on the site.

There is no public shoreline access currently on the site. Limited public access to the waterfront is available at the northern end of OSU Drive, to the immediate east of the site, where a small sandy beach is present between rocky shorelines.

Yaquina Bay provides ample opportunities for clamming, crabbing and fishing. Offshore, salmon, halibut, and albacore are favored species for commercial and sport fishers. Inside the bay and lower river, anglers fish for salmon, perch, rockfish, and bottom species like sole and flounder. Out along the jetties, at the entrance to the bay, lingcod and rockfish are favorite species (Oregon State Marine Board, 2007). Bird watching is also a common recreational activity within the bay.

5.5.5.2 Environmental Consequences

Implementation of the proposed action at Site Alternative 4 would have negligible effects on regional or local recreational resources. The majority of recreational resources are located at such a distance from the site, that users would not likely be affected by the proposed action.

With respect to informal recreational opportunities such as fishing and shellfish gathering, and recreational boating within the bay, the proposed alternative would have minor effects on this resource. Once constructed, the proposed new pier facility and presence of NOAA vessels would be visually obvious, and the number of vessel movements in the site vicinity would increase as a result of the proposed action. However, the use of the immediate site vicinity by

recreational boaters and fishers is likely to be low, due to the current use of the existing dock by Corvahlo Fisheries, use of the adjacent OSU dock by research vessels, and the presence of the nearby shipping channel. Such activities in other areas of the Bay would have negligible effects from the proposed action.

During construction, there may be slight, short-term effects on the amenity of the bay due to construction traffic, noise and visual changes, however it is unlikely that users' experiences at the beach would be disrupted to the extent that the values could not be enjoyed.

The proposed action at this Site Alternative would have negligible effects on public shoreline access, as there would be no change to the current situation of no public access to the shoreline in the vicinity of the site.

5.5.5.3 Mitigation Measures

No mitigation measures with respect to recreational resources would be required for the proposed action at Site Alternative 4.

5.6 CULTURAL RESOURCES

Section 106 of the National Historic Preservation Act of 1966, as amended, requires federal agencies to consider the effects of their actions on properties in or eligible for inclusion in the National Register of Historic Places (NRHP). Compliance with Section 106 requires consultation with the State Historic Preservation Office (SHPO) and as necessary, the Advisory Council on Historic Preservation if there is a potential adverse effect to historic properties. If adverse effects on historic, archaeological, or cultural properties are identified, then agencies must attempt to avoid, minimize, or mitigate the impacts to these resources.

Within the state of Washington, the Department of Archaeology and Historic Preservation (DAHP) is also responsible for issuing formal opinions on the significance, eligibility and impacts to sites of historic significance. The DAHP maintains the official state list of historic places, termed the Washington State Heritage Register. Within the state of Oregon, the SHPO maintains the official state list of historic places, termed the Oregon Historic Sites Database.

Historic, archaeological, and cultural resource investigations were conducted by URS Corporation in March-April 2009 to evaluate the potential for resources within each Site Alternative project location that might be considered eligible for nomination to the NRHP. These investigations included a review of records at the Washington State DAHP and Oregon SHPO to identify previously documented resources and prior investigations conducted within a one-mile radius of each of the proposed Site Alternatives.

The investigation of historic resources (i.e., above-ground buildings, sites, objects, structures, or districts) included a review of previous studies, historic documents, photographs, and maps of the area. A field survey of above-ground structures was conducted at each Site Alternative project location.

The cultural resources (i.e., subsurface prehistoric and historic sites or objects) assessment included a review of previous studies, historic records, photographs, maps, geotechnical information of the area. A pedestrian field survey was conducted at each Site Alternative project location. The survey confirmed the presence of fill and the absence of archaeological resources within the fill as visible on the ground surface. Subsurface testing was not practicable for identification of possible archaeological resources given the depth of fill and extent of development.

5.6.1 No-Action Alternative

5.6.1.1 Existing Environment

The No-Action Alternative assumes continuation of upland activities at the existing MOC-P site on Lake Union, and continuation of water-based activities (ship berthing, etc) at various temporary locations around Lake Union and the Seattle area, as described in Section 4.3 above. The existing environment of the Lake Union area in relation to cultural resources is described more fully in Section 5.6.2.1 below.

5.6.1.2 Environmental Consequences

Under the No-Action Alternative, there would be no change in activities occurring at the site, and therefore no potential impacts to cultural resources.

5.6.1.3 Mitigation Measures

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

5.6.2 Site Alternative 1: Lake Union

5.6.2.1 Existing Environment

Site Alternative 1 is located along the eastern shore of Lake Union. The area comprising the site historically consisted of submerged shoreline at least during the past 100 years, until fill was placed on the landform in the 1960s, raising the land to above sea level and allowing permanent development to occur.

No historic resources are located within the boundary of the site. A total of 21 historic properties are located within a one-mile radius of the project location. Properties closest to the site include the Lake Union Drydock, which is one of the oldest boatyards on the lake, and where several historic vessels are wintered including *Adventuress* and the Zodiac schooner; and the Tenas Chuck Moorage Historic District, which consists of a small community of houseboats.

No known archaeological resources are located within the boundary of the site. Eight previous investigations have been conducted within a one-mile radius of the site, and no significant archaeological sites have been recorded.

5.6.2.2 Environmental Consequences

No known historic, archaeological, or cultural resources would be affected by Site Alternative 1. However, it is possible that deeply buried, intact archeological deposits are present below the fill. The project area is considered to have a moderate probability for containing buried cultural resources based on proximity to Lake Union. Below-fill construction and utility installation, if any, could disturb natural sediments along the former beach and shoreline resulting in potential direct impacts to resources.

5.6.2.3 Mitigation Measures

As no adverse effects to known historic, archaeological, or cultural resources were identified, no mitigation is necessary. However, it is possible that deeply buried, intact archeological deposits are present below the fill. If NOAA proceeds with Site Alternative 1, mitigation commensurate with future plans of development may be appropriate in consultation with applicable state, tribal and local agencies.

It is expected that the lessor will satisfy appropriate mitigation measures by following the usual permitting and regulatory requirements.

5.6.3 Site Alternative 2: Port Angeles

5.6.3.1 Existing Environment

Site Alternative 2 is located along the southern shore of Port Angeles Harbor. The area comprising the site historically consisted of shoreline that appears to have been mostly submerged during the past 100 years, until dredge spoils were placed on the landform in the 1920s, raising the land above sea level and allowing permanent development to occur.

No known historic resources are located within the boundary of Site Alternative 2. Previous development, which includes a warehouse and maintenance shop, is less than 50 years of age and

therefore does not qualify as historic. A total of six historic properties are located within a one-mile radius of the project location.

Archaeological resources may be located below the fill. Several significant archaeological deposits, which include shell midden, burials, and artifacts, have been found within one mile of the project area. The Port Angeles Harbor area was traditionally occupied by the Klallam Tribe. Early historic and ethnographic accounts indicate that several Native American villages were situated along the waterfront of Port Angeles. The village site and cemetery known as "Tse-whit-zen" was identified in 2003 during the construction of a graving dock project. Another village site referred to as "Hollywood Beach" is listed on the Washington State Heritage Register. A third village is depicted on an 1853 hydrographic map of Port Angeles Harbor (U.S. Coast Survey, 1853) and is situated at the mouth of Tumwater Creek. This location corresponds to the immediate vicinity of project site.

5.6.3.2 Environmental Consequences

It is possible that deeply buried, intact archeological deposits associated with an "Indian Village" depicted on the 1853 map, are present below the fill. As a result, the project area is considered to have a moderate-high probability for containing buried cultural resources. Below-fill construction and utility installation, if any, could disturb natural sediments along the former beach and shoreline resulting in potential direct impacts to resources.

5.6.3.3 Mitigation Measures

As no adverse effects to known historic, archaeological, or cultural resources were identified, no mitigation is necessary. However, it is possible that deeply buried, intact archeological deposits are present below the fill. If NOAA proceeds with Site Alternative 2, mitigation commensurate with future plans of development may be appropriate in consultation with applicable state, tribal and local agencies.

It is expected that the lessor will satisfy appropriate mitigation measures by following the usual permitting and regulatory requirements.

5.6.4 Site Alternative 3: Bellingham

5.6.4.1 Existing Environment

Site Alternative 3 is located along the eastern shore of Bellingham Bay. The area comprising the site historically consisted of tideflats that appear to have been submerged at least during the past 100 years, until dredge spoils were placed on the landform in the 1950s, raising the land to above sea level and allowing permanent development to occur.

No historic properties are located within the proposed site. Previous development, which includes a dock, maintenance shed and warehouse, is less than 50 years of age and therefore does not qualify as historic. In 2007, a historic property technical report was prepared by Artifacts Consulting, Inc. for the New Whatcom Redevelopment Project EIS, which included the proposed project area. The report recommends the Whatcom Waterway, located adjacent and directly north of the project area, as eligible for the NRHP pending SHPO concurrence (Artifacts Consulting, Inc. 2007). Additionally, 25 historic buildings, structures or districts, are situated with a one mile radius of the project area.

No known archaeological resources are located within the proposed site. One previous archaeological investigation has been conducted within the project area (Kopperl, 2007) and no archaeological resources were identified. Seven previously investigations have been conducted within a one-mile radius of the proposed site, and four archaeological sites recorded.

5.6.4.2 Environmental Consequences

No known historic, archaeological, or cultural resources would be affected by Site Alternative 3. However, it is possible that deeply buried, intact archeological deposits are present below the fill. The project area is considered to have a moderate probability for containing buried cultural resources based on proximity to Bellingham Bay. Below-fill construction and utility installation, if any, could disturb natural sediments along the former beach and shoreline resulting in potential direct impacts to resources.

5.6.4.3 Mitigation Measures

As no adverse effects to known historic, archaeological, or cultural resources were identified, no mitigation is necessary. If the proposed action proceeds under Site Alternative 3, mitigation commensurate with future plans of development may be appropriate in consultation with applicable state, tribal and local agencies.

It is expected that the lessor will satisfy appropriate mitigation measures by following the usual permitting and regulatory requirements.

5.6.5 Site Alternative 4: Newport

5.6.5.1 Existing Environment

Site Alternative 4 is located along the southern shore of Yaquina Bay. The area comprising the site historically consisted of sand flats that appear to have been mostly submerged but episodically emergent at least during the past 100 years, until dredge spoils were placed on the

landform in the 1960s, raising the land to above sea level and allowing permanent development to occur.

No known historic properties are located within the proposed site. Previous development, which includes a fish farm complex and related piers and structures, is less than fifty years of age and therefore does not qualify as historic.

Archaeological resources may be located below the fill. The potential for sea level rise as late as the nineteenth century, combined with episodic subsidence events, suggests the sand flat which characterized the project site may not have been submerged until fairly recently. An earthquake and tsunami occurred around 300 years ago along the Oregon Coast and resulted in subsidence of estuarine landforms and quick accumulation of sediments, up to several meters in depth, in various locales (Gilsen, 2002). Theoretically, pre-contact occupations could have occurred for millennia prior to this occasion at the project site, during periods of lower sea levels and prior to landform subsidence. Such an interpretation is consistent with reports of prehistoric materials within the dredged materials from within the bay. Several significant archaeological deposits, which include shell midden, burials, and artifacts, have been found within one mile of the project area.

The Yaquina Bay waterfront was traditionally occupied by the Yaquina, who occupied a village at present-day South Beach. Euro-American settlement of the general South Beach/Newport area occurred by the 1860s. Cultural sensitivity of the project site is indicated by a passing, undocumented reference to an "Indian Village" in the general area (USACE, 1976), and a reference to artifacts including arrowheads, spear points, and scrapers, being pulled from the bay during dredging in 1967 (Wilcox, 1974). An archaeological deposit recorded south of Site Alternative 4 correlates to the ethnographically documented *Na-aic'* village. The general South Beach area is a reported summer camp of the Yaquina (Port of Newport, 2009). A report of flounder fishing by Yaquina occurring "off a large flat visible from Newport" (Byram, 2002, citing Harrington, 1942), which likely refers to the project vicinity, also indicates potential fishing-related use of the project site.

Additionally, there is a potential for submerged vessels to be located within the immediate site vicinity. Because of its geographic position at a prominent point opposite Newport, the project vicinity would have been frequently traversed, both prehistorically and historically, as a water crossing from Newport to South Beach. Historical accounts attest to the wrecking of small crafts during this crossing (e.g., Blue, 1980; Fogarty, 1980), as well as to wrecking of larger crafts in the near vicinity (e.g., Fagan, 1885; Martin, 1985).

5.6.5.2 Environmental Consequences

It is possible that deeply buried, intact archeological deposits associated with historic references to an "Indian Village" and perhaps submerged vessels are present below the fill. As a result, the project area is considered to have a moderate probability for containing buried cultural resources. Below-fill construction and utility installation, if any, could disturb natural sediments along the former beach and shoreline resulting in potential direct impacts to resources.

5.6.5.3 Mitigation Measures

As no adverse effects to known historic, archaeological, or cultural resources were identified, no mitigation is necessary. However, it is possible that deeply buried, intact archeological deposits are present below the fill. If NOAA proceeds with Site Alternative 4, mitigation commensurate with future plans of development may be appropriate in consultation with applicable state, tribal and local agencies.

It is expected that the lessor will satisfy appropriate mitigation measures by following the usual permitting and regulatory requirements.

5.7 FLORA AND FAUNA

The federal Endangered Species Act (ESA) (16 USC 1536) provides for the conservation of endangered and threatened species of fish, wildlife and plants. Federal agencies must ensure that proposed actions do not jeopardize the continued existence of any endangered or threatened species, or cause the destruction or adverse modification of their habitat. If listed species or designated critical habitat are present and could be affected by the proposed project, a biological assessment must be prepared to analyze the potential effects of the project on listed species and critical habitat and make a determination of effect.

Prior to lease acquisition, development would occur on private property. The activity would be funded and undertaken by the selected lessor, a non-federal entity, within their property and adjacent waters of the U.S. Under the SFO, the lessor is required to comply with local, state and federal regulations. For compliance under Section 404 of the Clean Water Act (CWA), the selected lessor would apply for a permit from the USACE (see Section 5.9). Based on the lessor's ultimate design, consultation under Section 7 of the ESA would occur during that process with NOAA Fisheries and U.S. Fish and Wildlife Service (USFWS).

NOAA has analyzed potential effects to protected species and their habitat based on anticipated NOAA actions resulting from its site selection, lease of proposed facilities and MOC-P operation. This section discusses potential effects to existing habitat for flora and fauna, including occurrences of protected fish, wildlife and migratory bird species at or near each of the

proposed project alternatives. **Appendix D** contains a summary of protected marine species and habitats, which was used to inform the assessment of potential impacts at each Site Alternative and the No-Action Alternative.

5.7.1 No-Action Alternative

5.7.1.1 Existing Environment

The No-Action Alternative assumes continuation of upland activities at the existing MOC-P site on Lake Union, and continuation of water-based activities (ship berthing, etc.) at various temporary locations around Lake Union and the Seattle area, as described in Section 4.3 above. The existing environment of the Lake Union area in relation to flora and fauna is described more fully in Section 5.7.2.1 below.

5.7.1.2 Environmental Consequences

No construction or alteration of existing environmental conditions would occur under the No-Action Alternative. Therefore, no project-related impacts to flora and fauna would be expected to occur. Existing effects to flora and fauna from current land uses would be unchanged.

Under the No-Action Alternative, the existing burnt piles and debris (e.g., fire hoses and other debris) would remain in the water and continue to degrade over time. Allowing the shoreline to remain in its existing condition would continue to perpetuate the low-quality aquatic habitat conditions in this area. Adjacent temporary berths within Lake Union and others located in the region would continue to support individual NOAA ships, and any associated operational impacts would remain at those shoreline locations.

5.7.1.3 Mitigation Measures

No mitigation measures with respect to flora and fauna are recommended under the No-Action Alternative.

5.7.2 Site Alternative 1: Lake Union

5.7.2.1 Existing Environment

The existing MOC-P site at Lake Union is located in an urban environment that is paved with asphalt and concrete. The number of plants growing is so few that it can be considered effectively not vegetated. Invasive species such as butterfly bush (*Buddleja davidii*), Himalayan blackberry (*Rubus armeniacus*), and bull thistle (*Cirsium vulgare*) are scattered across the site, growing at the edge of paved areas or in cracks in the pavement. The few native species present were observed growing in similar conditions, and include small black cottonwood (*Populus*

balsamifera), bracken fern (*Pteridium aquilinum*), sword fern (*Polystichum munitum*), and autumn willowherb (*Epilobium paniculatum*).

No native terrestrial habitats exist on the site. However, some areas may be suitable habitat for species adapted to urban areas and frequent noise disturbances. These urban wildlife species include raccoons and opossum. Seabirds and waterfowl frequent Lake Union, including the area surrounding the project site. These birds are habituated to the noise in this urban environment. The proposed action would occur within the Pacific Flyway. Common migratory bird species protected under the Migratory Bird Treaty Act (MBTA) may nest or stop over at the site.

The USFWS website was consulted for ESA species occurring in within King County. In addition, queries of the Washington Natural Heritage Program (WNHP) and Washington Department of Fish and Wildlife (WDFW) databases revealed that no special status terrestrial plants, animals, or habitats occur on or near the existing MOC-P site at Lake Union.

The existing 7-acre NOAA facility is located on the east shore of Lake Union, a freshwater body. Between 1911 and 1917, the hydrology of the lake was altered significantly by the construction of the Fremont and Montlake cuts and the Hiram M. Chittenden Locks. These modifications increased inflow to Lake Union by diverting the Cedar and Sammamish Rivers and the outflow from Lake Washington through Lake Union via the Montlake Cut and the Ship Canal. The new Ship Canal provided navigable passage for commercial vessels, barges, and recreational boaters between Puget Sound and Lake Washington via Lake Union.

The Lake Union shoreline is heavily armored and the presence of bulkheads, docks, and overwater structures provides virtually no natural shoreline within the system (Weitkamp *et al*, 2000). Land use in this subarea consists primarily of water-dependent commercial and industrial uses, such as marinas, commercial shipyards, and commercial and residential development bordering the shoreline of Lake Union. Past development around Lake Union has degraded water quality and the aquatic habitat by reducing and/or eliminating natural shorelines through construction of docks and overwater structures and through release of contaminants associated with shipping activities (Weitkamp *et al*, 2000).

In addition to changes in the limnology and development of the littoral zone (as discussed above), exotic (i.e., non-native) plants and animals have affected the Lake Union/Lake Washington Ship Canal ecosystem. Twenty-three non-native fish species have been identified in Lake Washington (Weitkamp *et al*, 2000). Some of these species (e.g., smallmouth bass) are known to prey on juvenile salmon, while others are potential competitors with juvenile salmonids for food. Native fish species such as resident cutthroat, fall Chinook salmon, coho salmon, sockeye salmon, winter steelhead and bull trout also are documented in Lake Union

(WDFW, 2009) and use the lake primarily as a migratory corridor between Puget Sound and upstream freshwater streams or rivers.

Table 5.7-1 lists the threatened and endangered species that may be present on or near the site.

Table 5.7-1: Threatened and Endangered Species Present in or near Lake Union

Species	ESU or DPS	Federal Status	State Status
Chinook Salmon (*Oncorhynchus tshawytscha*)	Puget Sound ESU	T	C
Steelhead (*O. mykiss)*	Puget Sound DPS	T	C
Bull Trout (*Salvelinus confluentus*)	Coastal-Puget Sound DPS (Puget Sound Management Unit) Critical Habitat Unit 28-Puget Sound	T	C

C=Candidate T=Threatened DPS=Distinct Population Segment ESU=Evolutionarily Significant Unit
Source: (WDFW, 2009 and NMFS, 2009).

5.7.2.2 Environmental Consequences

Due to the urbanized conditions and lack of critical habitat at and near the Lake Union site, there are no anticipated direct or cumulative impacts to native terrestrial habitats or listed species associated with this alternative. The project does not involve tall structures with hard-to-see elements or lighting that may attract birds. Structures would be low profile and easily avoided by birds. Nesting habitat for urban wildlife species such as swallows may be disturbed or removed during construction of this alternative. However, it would be replaced with other structures with potential for nest sites for these species. Therefore temporary impacts to migratory birds are likely to occur, but the impacts would not be significant to the populations.

Impacts to aquatic species and habitat would occur during the repair and installation of piles. Disturbance would occur in the form of underwater noise during pile driving and temporary water quality changes as a result of turbidity from in-water work. Limited pile driving would occur within the freshwater environment, as only ten piles are proposed to be installed for the small boat dock. Therefore, few aquatic species, including threatened and endangered species, would be affected. In addition, no previously undisturbed habitat areas would be impacted under the proposed action.

No short- or long-term effects to terrestrial species or habitats are anticipated to occur due to implementation of the proposed action at this site. The short-term effects of construction on aquatic species would be localized and less than significant; however, these effects could be further reduced using mitigation measures. By applying the mitigation measures recommended below, construction impacts would be characterized as minor.

Long-term effects to fish and aquatic vegetation from shading of benthic environments by overwater structures would be considered a moderate impact, but an effect unchanged from existing conditions if no other mitigation measures are included in the pier design (i.e., steel

grating used as deck material instead of a solid impervious surface where appropriate). Overall, the proposed NOAA action may affect threatened and endangered species indentified in **Table 5.7-1**, but is not likely to adversely affect the continued existence of those species.

5.7.2.3 Mitigation Measures

No mitigation measures are recommended for Site Alternative 1 relative to terrestrial species or habitats.

Impacts to aquatic species and habitats would be minimized by implementing measures that result in adherence to the following regulations: waste material disposal per WAC 220-110-070; and the water quality restrictions imposed by the WDOE (Chapter 173-201A WAC), which specifies a mixing zone beyond which water quality standards cannot be exceeded. Compliance with WDOE standards is intended to ensure that fish and aquatic life are being protected to the extent feasible and practical. The example measures described in Section 5.4.2.3 of this EA in relation to water quality will also assist in mitigating impacts to aquatic species and habitats.

Example, or equivalent, measures for aquatic species and habitats could include:

- Timing restrictions should be used for all in-water work to protect ESA-listed salmonids, as well as marine mammals (for marine sites). This measure reduces the number of species exposed to underwater noise and other disturbance.
- The vibratory hammer method should be used to the extent possible to drive steel piles in order to minimize underwater noise levels. A bubble curtain is not required during vibratory pile driving.
- A bubble curtain(s) should be employed during impact hammer installation of steel piles. Underwater noise should be minimized to the extent possible by driving the largest piles in the deepest water during the low-tide periods (if applicable).
- Design of overwater structures should allow as much light as possible (e.g., grating versus impervious surface) to the water to reduce shading impacts.

It is expected that the lessor will satisfy appropriate mitigation measures by following the usual permitting and regulatory requirements.

5.7.3 Site Alternative 2: Port Angeles

5.7.3.1 Existing Environment

The Port Angeles site is currently developed for vehicle and equipment storage, and operation of a maintenance shop building, and has until recently been used as a log storage and handling area.

The majority of the site is gravel, with paved areas located west of the Maintenance Shop building. The shoreline is armored with riprap and only contains scattered Scot's broom (*Cytisus scoparius*) and Himalayan blackberry (*Rubus armeniacus*). The graveled areas on the site are largely unvegetated with the occasional patch of non-native plants such as velvetgrass (*Holcus lanatus*) and orchardgrass (*Dactylis glomerata*).

Tumwater Creek is channelized between two walls along the eastern boundary of the site. There are no plants growing in the channel. However, red alder (*Alnus rubra*) and Sitka willow (*Salix sitchensis*) were observed along the edge of the stream at the base of the walls. There is a narrow, linear band of vegetation above the walls, including coastal mugwort (*Artemisia suksdorfii*), orchardgrass, Scot's broom, and Himalayan blackberry.

No native terrestrial habitats exist on the site (Tumwater Creek is considered an aquatic habitat). However, some areas may be suitable habitat for species adapted to urban areas and frequent noise disturbances. These urban wildlife species include raccoons, opossum, and swallows. Seabirds and waterfowl frequent Port Angeles Harbor, including the area surrounding the project site. However, these birds are habituated to the noise in this developed port environment. The proposed action would occur within the Pacific Flyway. Common migratory bird species protected under the MBTA may nest or stop over at the site.

The USFWS website was consulted for ESA species generally occurring in within Clallam County. In addition, queries of the WNHP and WDFW databases revealed that no special status terrestrial plants, animals, or habitats occur on the Port Angeles site.

The Port Angeles Harbor is a tidally influenced marine waterbody that receives freshwater input from various streams, including Tumwater Creek. The Port Angeles Harbor is protected from the open waters of the Strait of Juan de Fuca by Ediz Hook, a 4-mile long sand spit.

The site has been used for marine industrial purposes since 1947 or earlier, with the phased establishment of in-water and overwater industrial infrastructure and upland facilities. The site is located on reclaimed land and has undergone high levels of development and industrialization in both the upland and aquatic environment. Specifically, the property has been used as a shipping terminal and log rafting and handling facility. There are numerous abandoned pilings and dolphins along the shoreline that are associated with log rafting operations. The shoreline has a gentle beach area at the mouth of Tumwater Creek and areas of large rip rap further west.

Habitat in Port Angeles Harbor is typical of nearshore marine habitat found in the Pacific Northwest, and includes intertidal habitat (+8 feet MLLW to -4 feet MLLW), shallow subtidal (-4 ft MLLW to -10 ft MLLW), and subtidal habitat (below -10 ft MLLW). In general, the intertidal and shallow subtidal environments provide higher quality habitat than subtidal habitat. Nearshore marine habitats typically support a variety of marine invertebrates, ranging from

infauna (worms, clams, and small ghost shrimp that penetrate benthic sediments) to epibenthic plankters (organisms such as very small crustaceans that move off the substrate surface) to larger invertebrates such as oysters, crabs, and shrimp.

Tumwater Creek is adjacent to the site and provides a source of freshwater to the marine harbor. This creates a localized estuary environment beneficial to numerous marine species and anadromous salmonids that utilize Tumwater Creek for various life history stages. Salmonids documented in Tumwater Creek include resident cutthroat, coho salmon, and summer and winter steelhead (WDFW, 2009).

Tumwater Creek is a relatively small independent drainage that historically has moderately low productivity. It has supported populations of chum (fall), coho and winter steelhead. Chum have been extirpated and coho and steelhead productivity is currently limited.

Current productivity is judged to be low, and with a limited potential for improvement due to urban and industrial development in the lower watershed, rural development in the upper watershed, stormwater impacts, and sediment from the massive erosion feature. Urban and rural developments have had substantial impact in Tumwater Creek. A 2007 Washington SEPA environmental review checklist was completed for a proposed bridge replacement and sheet pile removal action. Though not initiated, the review of that action resulted in a Determination of Non-Significance (DNS).

Most nearshore areas in the industrial sections of the Harbor provide poor salmonid habitat. Sulfides generated from the decomposition of consolidated sludge beds and wood waste accumulations within the Harbor may be impacting biota.

The marine resources potentially present in Port Angeles Harbor include marine nearshore habitats (e.g., eelgrass, kelp beds), marine mammals, seabirds, sea turtles, fish, and shellfish. The Port Angeles site is adjacent to the Strait of Juan de Fuca, which is a migratory pathway for numerous marine mammals and salmonids enroute to the more inland waters of Puget Sound or the Strait of Georgia in Canada. For example, orca whales routinely transit through the Strait of Juan de Fuca and are typically observed in Rosario Strait and near the San Juan Islands.

Sea turtles (specifically the leatherback) are more likely to be present along the outer coast of Washington and Oregon, but rare occurrences in the Strait are possible. It is unlikely that a sea turtle or a large whale (e.g., blue, fin, or sei whales) would be present at the project site in the inner harbor.

Seals and sea lions likely haul out within the harbor, although no haul outs were identified (WDFW, 2009). There is a bald eagle nest over a half-mile away from the site along the shoreline and likely within line of sight. There was no surf smelt, sand lance, rock sole, or

herring within the project area (WDFW, 2009). The nearest surf smelt/sand lance spawning area was over half a mile away.

Table 5.7-2 lists the threatened and endangered species that may be present on or near the site.

Table 5.7-2: Threatened and Endangered Species Present in or near Port Angeles

Species	ESU or DPS	Federal Status	State Status
Chinook Salmon (*O. tshawytscha)*	Puget Sound ESU	T	C
Chum Salmon (*O. keta)*	Hood Canal summer-run ESU	T	C
Steelhead (*O. mykiss)*	Puget Sound DPS	T	C
Bull Trout (*Salvelinus confluentus*)	Coastal-Puget Sound DPS (Olympic Peninsula Management Unit) Critical Habitat Unit 27-Olympic Peninsula River Basins	T	C
Eulachon (*Thaleichthys pacificus*)	-	PT	C
Green Sturgeon (*Acipenser medirostris*)	Southern DPS	T	None
Marbled Murrelet (*Brachyramphus marmoratus*)	-	T	T
Killer Whale (*Orcinus orca)*	Southern Resident DPS	E	E
Humpback Whale (*Megaptera novaeangliae*)	-	E	E
Steller sea lion (*Eumetopias jubatus*)	Eastern DPS	T	T

C=Candidate *T=Threatened* *ESU=Evolutionarily Significant Unit*
E=Endangered *PT=Proposed Threatened* *DPS=Distinct Population Segment*

Source: (WDFW, 2009 and NMFS, 2009).

5.7.3.2 Environmental Consequences

Due to the urbanized industrial waterfront at and near the Port Angeles site, there are no anticipated direct or cumulative impacts to native terrestrial habitats or listed species associated with Site Alternative 2. Proposed work in Tumwater Creek would not require the removal of the red alders and willows. The project does not involve tall structures with hard-to-see elements or lighting that may attract birds. Structures would be low profile and easily avoided by birds. Nesting habitat for urban wildlife species such as swallows may be disturbed or removed during construction of this Site Alternative. However, it would be replaced with other structures with potential for nest sites for these species. Therefore temporary impacts to migratory birds are likely to occur, but the impacts would not be significant.

Impacts to aquatic species and habitat at the Port Angeles site would occur via pile removal and installation, and would also impact species through dredging operations. In addition, piles and decking at an obsolete approach piers leading to Terminal 3 would be removed. Disturbance would occur in the form of underwater noise during pile driving and water quality changes as a result of turbidity from pile removal and in-water work. The scale of the in-water work may require dredging during initial construction, but also the potential for maintenance dredging in the future. The existing Port Angeles site has overwater infrastructure at Terminal 3: however,

extension of this overwater structure would be built to accommodate NOAA berthing requirements. This action would result in a change from the existing (unoccupied) nearshore habitat to occupied nearshore habitat. These currently unoccupied nearshore areas are adjacent to the existing commercial infrastructure in shallow subtidal and/or subtidal areas and near (or in) the delta of Tumwater Creek.

The effects of pier/wharf construction are localized and could be mitigated using recommended measures. The scale of impacts would be moderate, as a result of dredging and the permanent nearshore habitat loss associated with constructing 31,200 square feet of additional overwater infrastructure in the marine environment where there currently is none. Anticipated impacts to flora and fauna would occur during construction and would be characterized as moderate due to the habitat loss and dredging.

Shading from the overwater structures is a permanent impact and therefore would be considered a moderate impact. While mitigation measures such as design of the overwater surfaces to allow light penetration into the aquatic environment for fish and aquatic vegetation (i.e., grating instead of a solid impervious surface where appropriate) would reduce this impact, it would not eliminate the impact entirely. Overall, the proposed NOAA action may affect threatened and endangered species indentified in **Table 5.7-2**, but is not likely to adversely affect the continued existence of those species.

5.7.3.3 Mitigation Measures

No mitigation measures are proposed for terrestrial habitats or species associated with this alternative.

Impacts to aquatic species and habitats would be minimized by implementing measures that result in adherence to the following regulations: waste material disposal per WAC 220-110-070; and the water quality restrictions imposed by the WDOE (Chapter 173-201A WAC), which specifies a mixing zone beyond which water quality standards cannot be exceeded. Compliance with WDOE standards is intended to ensure that fish and aquatic life are being protected to the extent feasible and practical.

The example measures for limiting impacts to aquatic species and habitats for Site Alternative 2 would be the same as described in Section 5.7.2.3, which includes example measures for water quality described in Section 5.4.2.3.

In addition, planning and construction practices recommended for dredging are as follows:

- Use the smallest dredge practicable to accomplish the task and target the specific areas to be dredged.

- Avoid areas designated as priority habitat by WDFW (e.g., eelgrass beds, kelp beds).

It is expected that the lessor will satisfy appropriate mitigation measures by following the usual permitting and regulatory requirements.

5.7.4 Site Alternative 3: Bellingham

5.7.4.1 Existing Environment

The Bellingham site is located in an urban environment in which upland portions are generally paved with asphalt and concrete, however a small gravel area is present to the southeast of the log pond. Plants observed on the site include occasional weedy native or invasive non-native species located in cracks or at the edge of the pavement. However, the number of plants growing on the site is so small that the affected area could be considered unvegetated.

No native terrestrial habitats are present. Some areas may be suitable habitat for species adapted to urban areas and frequent noise disturbances. These urban wildlife species include raccoons, opossum, and swallows. Seabirds and waterfowl frequent Bellingham Bay, including the area surrounding the project site. These birds are habituated to the noise in this urban environment. The proposed action would occur within the Pacific Flyway. Common migratory bird species protected under the MBTA may nest or stop over at the site.

The USFWS website was consulted for ESA species generally occurring within Whatcom County. In addition, queries of the WNHP and WDFW databases revealed that no special status terrestrial plants, animals, or habitats occur on the Bellingham site.

The proposed site is located on the northeastern side of inner Bellingham Bay at the Bellingham Shipping Terminal. The site is adjacent to Bellingham Bay to the west, Whatcom Waterway to the north, and a former log pond to the east, all of which are interconnected. The site is built on reclaimed land formed by filling a tidal flat area of the Whatcom Creek delta. Filling was accomplished primarily in the 1950s and 1960s.

The site has historically been used as a marine industrial site with existing in-water and overwater industrial infrastructure and upland facilities. The site includes high levels of development and industrialization in both the upland and aquatic environment. Specifically, the property has been used as a dock and shipping terminal since the 1930s.

The log pond adjacent to the site was created as various fills were placed around the area. It was used for log handling and was the location of the original wastewater outfall from the Georgia Pacific chlor-alkali plant to Bellingham Bay. Currently, there are very few structures within the log pond. A pile-supported conveyor system exists along the Bellingham Shipping Terminal

shoreline, several dolphins are located within the log pond, and there are numerous pilings along the shoreline.

Inner Bellingham Bay is a tidally-influenced marine water body that receives freshwater input from various streams, including nearby Whatcom Creek. Whatcom Waterway is adjacent to the site and extends to the mouth of Whatcom Creek. Whatcom Creek originates from Lake Whatcom and drains to the Whatcom Waterway, which mixes with marine water from Bellingham Bay and forms a localized estuary environment. This estuary provides important habitat for aquatic species, including migratory salmonids continuing up Whatcom Creek. Salmonids documented in Whatcom Creek include resident cutthroat, fall Chinook, fall chum, coho salmon, pink salmon, sockeye salmon, and winter steelhead (WDFW, 2009).

Habitat in Bellingham Bay and Whatcom Waterway is typical of nearshore marine habitat and includes intertidal habitat (+8 ft MLLW to -4 ft MLLW), shallow subtidal (-4 ft MLLW to -10 ft MLLW), and subtidal habitat (below -10 ft MLLW). In general, the intertidal and shallow subtidal environments provide higher quality habitat than subtidal habitat. Nearshore marine habitats typically support a variety of marine invertebrates, ranging from infauna (worms, clams, and small ghost shrimp that penetrate benthic sediments) to epibenthic plankters (organisms such as very small crustaceans that move off the substrate surface) to larger invertebrates such as oysters, crabs, and shrimp.

The marine resources potentially present include: marine nearshore habitats (e.g., eelgrass, kelp beds), marine mammals, seabirds, fish, and shellfish.

The log pond is documented as a potential surf smelt/sand lance spawning area (WDFW, 2009) and turf algae is also documented. Pacific herring is known to congregate in the deeper waters of Bellingham Bay, but not at the site (WDFW, 2009). Several species of groundfish occur in shallow and deep water in Bellingham Bay for part or all of their life. Seven species of pandalid shrimp, including, pink, coonstripe, dock, and spot shrimp occur in nearshore and deeper waters of Bellingham Bay.

Harbor seals have documented haul outs within half a mile of the site and would be present year-round. Seals and sea lions have been noted using the log pond. Migrating gray whales have been noted to enter Bellingham Bay and feed in subtidal areas of Puget Sound. Orca whales are observed occasionally in and near Bellingham Bay, though they are more often observed in Rosario Strait and near the San Juan Islands, approximately 30 miles from the site. Sea turtles are unlikely in the inland waters of Washington State, but occurrences are possible. The nearest bald eagle nest is over two miles away and out of line-of-sight.

Table 5.7-3 lists the threatened and endangered species that may be present on or near the site.

Table 5.7-3: Threatened and Endangered Species Present in or near Bellingham

Species	ESU or DPS	Federal Status	State Status
Chinook Salmon (*O. tshawytscha)*	Puget Sound ESU	T	C
Steelhead (*O. mykiss)*	Puget Sound DPS	T	C
Bull Trout (*Salvelinus confluentus*)	Coastal-Puget Sound DPS (Puget Sound Management Unit) Critical Habitat Unit 28-Puget Sound	T	C
Eulachon (*Thaleichthys pacificus*)		PT	C
Green Sturgeon (*Acipenser medirostris*)	Southern DPS	T	None
Marbled Murrelet (*Brachyramphus marmoratus*)	-	T	T
Killer Whale (*Orcinus orca)*	Southern Resident DPS	E	E
Humpback Whale (*Megaptera novaeangliae*)	-	E	E
Steller sea lion (*Eumetopias jubatus*)	Eastern DPS	T	T

C=Candidate T=Threatened DPS=Distinct Population Segment
E=Endangered PT=Proposed Threatened ESU=Evolutionarily Significant Unit
Source: (WDFW, 2009 and NMFS, 2009).

5.7.4.2 Environmental Consequences

Due to the urbanized upland conditions at and near the Bellingham site, there are no anticipated direct or cumulative impacts to native terrestrial habitats or listed species associated with this alternative. The project does not involve tall structures with hard-to-see elements or lighting that may attract birds. Structures would be low profile and easily avoided by birds. Nesting habitat for urban wildlife species such as swallows may be disturbed or removed during construction of this alternative. However, it would be replaced with other structures with potential for nest sites for these species. Therefore temporary impacts to migratory birds are likely to occur, but the impacts would not be significant to the populations.

Impacts to aquatic species and habitat at the Bellingham site would occur via the same mechanisms (pile removal and installation) as described in Section 5.7.2.2. Disturbance would occur in the form of underwater noise during pile driving and water quality changes as a result of turbidity from in-water work. The scope of in-water work is minor because the majority of the infrastructure is already in place at this site. The proposed small boat moorage and wave attenuator are to be constructed, along with installation of three dolphins.

The effects of pier/wharf construction are localized and could be mitigated. The impacts could be characterized as minor due to the limited scope of in-water work.

Shading from the overwater structures is a permanent impact and therefore would be considered a moderate impact. Design of the overwater surfaces to allow light penetration into the aquatic

environment (i.e., grating instead of a solid impervious surface where appropriate) would reduce, but not eliminate, this impact. Overall, the proposed NOAA action may affect threatened and endangered species indentified in **Table 5.7-3**, but is not likely to adversely affect the continued existence of those species.

5.7.4.3 Mitigation Measures

No mitigation measures are recommended for native terrestrial habitats or species associated with this alternative.

Impacts to aquatic species and habitats would be minimized by implementing measures that result in adherence to the following regulations: waste material disposal per WAC 220-110-070; and the water quality restrictions imposed by the WDOE (Chapter 173-201A WAC), which specifies a mixing zone beyond which water quality standards cannot be exceeded. Compliance with WDOE standards is intended to ensure that fish and aquatic life are being protected to the extent feasible and practical.

The example measures for impacts to aquatic species and habitats for Site Alternative 3 would be the same as described in Section 5.7.2.3, which includes example measures for water quality described in Section 5.4.2.3.

It is expected that the lessor will satisfy appropriate mitigation measures by following the usual permitting and regulatory requirements.

5.7.5 Site Alternative 4: Newport

5.7.5.1 Existing Environment

The Newport site is largely developed and contains two active business operations. The vegetated portions of the site are mostly covered with non-native weedy species including orchardgrass, Himalayan blackberry, hairy cat's-ear (*Hypochaeris radicata*), crested dogtail (*Cynosurus echinatus*), Queen Anne's lace (*Daucus carota*), English plantain (*Plantago lanceolata*), and dove-foot geranium (*Geranium molle*).

No native terrestrial habitats exist on the site. However, some areas may be suitable habitat for species adapted to urban areas and frequent noise disturbances. These urban wildlife species include raccoons, opossum, and swallows. Seabirds and waterfowl frequent Yaquina Bay, including the area surrounding the project site. These birds are habituated to the noise in this active port. The proposed action would occur within the Pacific Flyway. Common migratory bird species protected under the MBTA may nest or stop over at the site.

Queries of the Oregon Natural Heritage Information Center database revealed that no special status terrestrial plants, animals, or habitats are recorded on the Newport site. Two special status plant species occur in the vicinity of the site. These plants are Point Reyes bird's-beak (*Cordylanthus maritimus* ssp. *palustris*) and short-stemmed sedge (*Carex brevicaulis*).

Point Reyes bird's-beak grows in and at the edges of salt marshes. There are no salt marshes on the Newport site and therefore no habitat for Point Reyes bird's-beak. In Oregon, short-stemmed sedge grows in sand on the outer Pacific coast. A small area on the shoreline of the project site may be potential habitat for short-stemmed sedge.

The geomorphology of the Yaquina Bay area is that of a drowned river mouth estuary consisting of a narrow mouth, embayments, and a narrow upstream channel. The harbor itself is merely the widening of Yaquina River mouth. The Yaquina Bay estuary is designated as a Deep Draft Development estuary under the Oregon Estuary Classification system.

Habitat in Yaquina Bay is that of a protected estuary. Tidal marshes have been reduced with urbanization, but are still present in some areas and provide important habitat for coho salmon, brown pelicans, bald eagles, marbled murrelets, sea-run cutthroat, steelhead trout, chum salmon, and Pacific lamprey. The remaining estuarine marsh habitat also supports the second highest use by waterfowl in Oregon and shelters high numbers and diversity of migratory shorebirds.

Habitat at the site was typical of nearshore estuarine habitat and includes intertidal habitat (+8 ft MLLW to -4 ft MLLW), shallow subtidal (-4 ft MLLW to -10 ft MLLW), and subtidal habitat (below -10 ft MLLW). In general, the intertidal and shallow subtidal environments provide higher quality habitat than subtidal habitat. Patches of eelgrass were observed at the site in eastern intertidal areas. A gentle sloping beach is adjacent to the western portion of the site. Areas of large rip rap and large concrete rubble are present along the shoreline, in addition to an abandoned fish ladder that would be removed as part of the proposed action.

Table 5.7-4 lists the threatened and endangered species that may be present on or near the site.

Table 5.7-4: Threatened and Endangered Species present in or near Yaquina Bay, Newport

Species	ESU or DPS	Federal Status	State Status
Coho Salmon (*O. kisutch)*	Oregon Coast ESU	T	SV
Eulachon (*Thaleichthys pacificus*)	-	PT	C
Green Sturgeon (*Acipenser medirostris*)	Southern DPS	T	None
Western Snowy Plover (*Charadrius alexandrinus nivosus*)	-	T	T
California Brown Pelican (*Pelecanus occidentalis californicus*)	-	E	E
Steller sea lion (*Eumetopias jubatus*)	Eastern DPS	T	None
Oregon Silverspot Butterfly (*Speyeria zerene hippolyta)*	-	T	NA

C=Candidate *T=Threatened* *DPS=Distinct Population Segment*
E=Endangered *PT=Proposed Threatened* *ESU=Evolutionarily Significant Unit*
Source: (Oregon Natural Resource Heritage Information Center, 2009 and NMFS, 2009).

5.7.5.2 Environmental Consequences

Due to the urbanized conditions at and near the Newport site, there are no anticipated direct or cumulative impacts to native terrestrial habitats or listed species associated with this alternative. The project does not involve tall structures with hard-to-see elements or lighting that may attract birds. Structures would be low profile and easily avoided by birds. Nesting habitat for urban wildlife species such as swallows may be disturbed or removed during construction of this alternative. However, it would be replaced with other structures with potential for nest sites for these species. Therefore temporary impacts to migratory birds are likely to occur, but the impacts would not be significant to the populations.

Impacts to aquatic species and habitat at Site Alternative 4 would occur via pile removal and installation, but also would impact species through dredging operations. Disturbance would occur in the form of underwater noise during pile driving and water quality changes as a result of turbidity from pile removal and in-water work, such as dredging. Vibratory pile driving has been successful in the bay for neighboring properties, but the need for proofing the piles with an impact hammer remains uncertain at present. The effects of pier/wharf construction are localized and could be mitigated using mitigation measures identified above in Section 5.7.2.3 for pile removal and pile installation, and in Section 5.7.3.3 for dredging.

The scope of the in-water work requires the removal of existing structures and construction of new overwater infrastructure, but it also requires dredging initially and potentially in the future for maintenance. The frequency of maintenance dredging is uncertain, but is expected to be approximately once every ten years (Dale, 2009a).

The scale of impacts would be moderate as a result of dredging and the permanent nearshore habitat loss associated with constructing additional overwater infrastructure where there currently is none. The impacts at the site during construction would be characterized as moderate due to the number of species impacted, the direct habitat loss, and dredging.

Shading from the overwater structures is a permanent, moderate impact. Design of the overwater surfaces to allow light penetration into the aquatic environment (i.e., grating instead of a solid impervious surface where appropriate) would reduce, but not eliminate, this impact. Overall, the proposed NOAA action may affect threatened and endangered species indentified in **Table 5.7-4**, but is not likely to adversely affect the continued existence of those species.

5.7.5.3 Mitigation Measures

Impacts to aquatic species and habitats would be minimized by implementing measures that result in adherence to the water quality standards imposed by ODEQ (OAR 340-041). The example measures for Site Alternative 4 would be the same as described in Sections 5.7.2.3 in

relation to impacts to aquatic species and habitats (including example measures for water quality described in Section 5.4.2.3) and Section 5.7.3.3 for planning and construction practices in relation to dredging.

In addition, the following mitigation measures are recommended for Site Alternative 4:

- A small area on the project site may be potential habitat for short-stemmed sedge. A survey is recommended for this plant during the appropriate season before construction begins.
- Adverse impacts of future development on eelgrass beds, shell fish beds, and fish spawning and nursery areas should be minimized, consistent with allowed development.

It is expected that the lessor will satisfy appropriate mitigation measures by following the usual permitting and regulatory requirements.

5.8 ESSENTIAL FISH HABITAT

5.8.1 Identification of Essential Fish Habitat

The Sustainable Fisheries Act of 1996 (Public Law 104-297) amended the Magnuson-Stevens Fishery Conservation and Management Act of 1976 (now called the Magnuson-Stevens Act) to provide an Essential Fish Habitat (EFH) description in federal Fishery Management Plans (FMPs) and to require federal agencies to consult with the NMFS on activities that may adversely affect EFH. Eight regional fishery management councils were established for the purpose of managing fisheries from 3 to 200 miles offshore of the U.S. coastline and for developing FMPs in conjunction with NMFS. All four Site Alternatives evaluated in this EA occur within the jurisdiction of the Pacific Fisheries Management Council (PFMC).

The PFMC is responsible for fisheries off the coasts of Washington, Oregon, and California, and has developed four FMPs (Pacific Salmon, Pacific Groundfish, Coastal Pelagic Species, and Highly Migratory Species). In addition, particularly sensitive and ecologically important habitat zones within the generally defined EFH are designated as Habitat Areas of Particular Concern (HAPCs).

The Magnuson-Stevens Act promotes the protection of these habitats through review, assessment, and mitigation of activities that may adversely affect these habitats. The significance of small-scale projects lies in the cumulative and synergistic effects resulting from a large number of these activities occurring in a single watershed.

A summary of the four FMPs (including a brief description of the EFH for each) is provided in **Table 5.8-1**, followed by a brief description of a few of the activities identified by the PFMC

that adversely affect EFH. Under the assessment of each Site Alternative, a site-specific list of EFH, impacts, and mitigation are provided.

Table 5.8-1: Summary of Essential Fish Habitat for each Fishery Management Plan

FMP	Description of EFH	Stocks included in FMP
Pacific Coast Salmon	Freshwater EFH for Pacific salmon includes all streams, lakes, ponds, wetlands, and other currently viable water bodies, but excludes habitat currently and/or historically inaccessible to salmon, such as upstream of man-made or natural barriers (e.g., dams and natural waterfalls). In the estuarine and marine areas, salmon EFH extends from the nearshore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone (EEZ) (200 nautical miles) offshore of Washington, Oregon, and California north of Point Conception.	Chinook, Coho, and Pink Salmon
Groundfish	EFH for groundfish include depths less than or equal to 3,500 meters (1,914 fathoms) to MHHW or the upriver extent of saltwater intrusion, defined as upstream and landward to where ocean-derived salts measure less than 0.5 ppt (parts per thousand) during the period of average annual low flow. Also, EFH includes seamounts in depths greater than 3,500 meters as mapped by the PFMC, and areas designated as HAPCs not already identified by the above criteria.	The Pacific Coast Groundfish FMP manages 80-plus species over a large and ecologically diverse area.
Coastal Pelagic Species	All marine and estuarine waters from the coasts of Washington, Oregon, and California to the limits of the EEZ (the 200-mile limit) and above the thermocline where sea surface temperatures range between 50 and 79 °F (10 and 26 °C). A thermocline is an area where water temperatures change rapidly, usually from colder at the bottom to warmer on top. Coastal Pelagic Species finfish generally live nearer to the surface than the sea floor.	This fishery includes four finfish—Pacific sardine, Pacific (chub) mackerel, northern anchovy, and jack mackerel—as well as market squid.
Highly Migratory Species	All marine waters from the coast to the limits of the EEZ. Highly Migratory Species are usually not associated with the features that are typically considered fish habitat (such as seagrass beds, rocky bottoms, or estuaries). They are pelagic and although they may spend part of their life cycle in nearshore waters, these species are not associated with estuaries.	This fishery includes tuna, swordfish, and sharks that range widely in the ocean, both in terms of area and depth.

EEZ=Exclusive Economic Zone
FMP=Fisheries Management Plan
HAPC=Habitat Area of Particular Concern
MHHW=mean higher high water level
PFMC=Pacific Fisheries Management Council

5.8.2 Identification of Habitat Areas of Particular Concern

Designated HAPCs include estuaries, canopy kelp, sea grass, rocky reefs, and designated areas of interest (this includes "all waters and sea bottom in [Washington] state waters from the three nautical mile boundary of the territorial sea shoreward to Mean Higher High Water (MHHW)"

and certain banks and seamounts off of Oregon). **Table 5.8-2** describes each HAPC and provides a brief description of where it is located.

Table 5.8-2: Identification of Habitat Areas of Particular Concern

HAPC	Defining Characteristics	Description
Estuaries	The inland extent of the estuary HAPC is defined as MHHW, or the upriver extent of saltwater intrusion, defined as upstream and landward to where ocean-derived salts measure less than 0.5 ppt during the period of average annual low flow. The seaward extent is an imaginary line closing the mouth of a river, bay, or sound; and to the seaward limit of wetland emergents, shrubs, or trees occurring beyond the lines closing rivers, bays, or sounds.	Estuaries are protected nearshore areas such as bays, sounds, inlets, and river mouths, influenced by ocean and freshwater. Because of tidal cycles and freshwater runoff, salinity varies within estuaries and results in great diversity, offering freshwater, brackish and marine habitats in proximity.[a] Estuaries tend to be shallow, protected, nutrient rich, and are biologically productive, providing important habitat for marine organisms, including groundfish.
Canopy Kelp	The canopy kelp HAPC includes those waters, substrate, and other biogenic habitat associated with canopy-forming kelp species (e.g., *Macrocystis* spp. and *Nereocystis* sp.). Kelp forest communities are found relatively close to shore along the open coast.	Of the habitats associated with the rocky substrate on the continental shelf, kelp forests are of primary importance to the ecosystem and serve as important groundfish habitat.
Seagrass	Eelgrass is found on soft-bottom substrates in intertidal and shallow subtidal areas of estuaries and occasionally in other nearshore areas. Surfgrass is found on hard-bottom substrates along higher energy coasts.	Seagrass species found on the West Coast of the U.S. include eelgrass species (*Zostera* spp.), widgeongrass (*Ruppia maritima*), and surfgrass (*Phyllospadix* spp.). These grasses are vascular plants, not seaweeds, forming dense beds of leafy shoots year-round in the lower intertidal and subtidal areas.
Rocky Reef	The rocky reefs HAPC includes those waters, substrates and other biogenic features associated with hard substrate (bedrock, boulders, cobble, gravel, etc.) to MHHW.	Rocky habitats are generally categorized as either nearshore or offshore in reference to the proximity of the habitat to the coastline. Rocky habitat may be composed of bedrock, boulders, or smaller rocks, such as cobble and gravel. Hard substrates are one of the least abundant benthic habitats, yet they are among the most important habitats for groundfish.
Areas of Interest that are designated HACPs	The Washington State waters HAPC includes all waters and sea bottom in state waters from the three-nautical-mile boundary of the territorial sea shoreward to MHHW.	This HAPC encompasses a variety of habitats important to groundfish, including other HAPCs such as rocky reef habitat supporting juvenile rockfish and estuary areas supporting many economically and ecologically important species, including juvenile lingcod and English sole. Sandy substrates within state waters are important habitat for juvenile flatfish.

[a] Haertel and Osterberg (1967)
HAPC=Habitat Area of Particular Concern
MHHW=mean higher high water level
ppt=parts per thousand

5.8.3 Definition of Potential Adverse Impacts

There are two levels of effect mentioned in Section 305(b)(3) of the Magnuson-Stevens Act: "adversely affect habitat" or "likely to substantially affect habitat." The definition of "adverse effect" is *"any impact that reduces quality and/or quantity of EFH, including direct (e.g., contamination or physical disruption), indirect (e.g., loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions"* (50 CFR §600.810).

An adverse effect to EFH can occur during port facility construction and/or operation of vessels. These would include direct, indirect, and cumulative impacts on shallow subtidal, deep subtidal, eelgrass beds, mudflats, sand shoals, rock reefs, and salt marsh habitats. Such impacts would be site-specific.

In general, adverse effects occur under the following broad activities: dredging, fill, the construction of docks and piers, anchor scour, vessel wake generation, ballast water exchange, pier lighting, bank stabilization, removal of shoreline vegetation, removal of riparian vegetation, waterway crossings for pipelines and conduits, channel realignment, discharge/runoff, water diversions, thermal additions, placement of contaminated material, introduction of exotic species, and conversion of aquatic habitat that may eliminate, diminish, or disrupt the function of EFH. In addition, vessel discharges, engine operations, bottom paint sloughing, boat washdowns, painting and other vessel maintenance activities can deliver debris, nutrients and contaminants to waterways and may degrade water quality and contaminate sediments.

These alterations can destroy EFH directly or indirectly by interrupting sediment supply that creates spawning and rearing habitat, by increasing turbidity levels and diminishing light penetration to eelgrass and other vegetation, by altering hydrology and flow characteristics, by raising water temperature, and by resuspending pollutants (Phillips, 1984).

5.8.4 No-Action Alternative

5.8.4.1 Existing Environment

The existing NOAA facility on Lake Union is located in USGS hydrologic unit code 17110012 (Lake Washington) and is designated EFH for Chinook and coho salmon (PFMC, 1999). Since the existing facility is located on a freshwater lake, there is no EFH for groundfish, coastal pelagic species, or highly migratory species.

The following EFH is identified in the project area:

- Pacific Salmon (Chinook and coho salmon).

5.8.4.2 Environmental Consequences

Under existing conditions, the burnt piles and debris (e.g., fire hoses) would remain in the water and continue to degrade over time. This use of the shoreline is not beneficial for EFH in the short or long-term because it would neither be restored to a natural state nor kept from further degrading habitat. Existing in-water structures would be left in disrepair and the conditions would remain as a low-quality salmon EFH area. Operational impacts from vessel operations would remain in their current shoreline locations (at other temporary berthing facilities). **Table 5.8-3** provides a summary of the project actions that affect EFH under the No-Action Alternative:

Table 5.8-3: Summary of Adverse Effects to EFH from the No-Action Alternative

FMP	Project Action	EFH Determination of Effect
Pacific Coast Salmon	Existing structures degrading water quality along shoreline	Adverse effect due to dilapidated structure remaining in nearshore freshwater EFH with continued contamination by creosote piles and debris along shoreline. However, salmonid use of this part of Lake Union is primarily as a migratory corridor, as these species (Chinook and coho salmon) do not typically utilize lake habitats as part of their life history. Due to the limited extent of anticipated in-water activities and absence of HAPC, the extent of potential adverse effects is considered to be less than significant, provided that appropriate mitigation measures are implemented.

EFH=Essential Fish Habitat *FMP=Fisheries Management Plan*

5.8.4.3 Mitigation Measures

No mitigation measures are recommended in relation to EFH for the No-Action Alternative.

5.8.5 Site Alternative 1: Lake Union

5.8.5.1 Existing Environment

Site Alternative 1 is located on Lake Union, in the same location as the existing MOC-P homeport facility. This area is located in USGS hydrologic unit code 17110012 (Lake Washington) and is designated EFH for Chinook and coho salmon (PFMC, 1999). Since the existing facility is located on a freshwater lake, there is no EFH for groundfish, coastal pelagic species, or highly migratory species.

The following EFH is identified in the project area:

- Pacific Salmon (Chinook and coho salmon).

5.8.5.2 Environmental Consequences

Under this alternative, a replacement Pier 1, Pier 2, and Wharf Pier would be constructed by repairing piles and installing ten replacement piles. No dredging would be required to achieve the water depths required by NOAA. **Table 5.8-4** provides a summary of the project actions that affect EFH at Site Alternative 1:

Table 5.8-4: Summary of Adverse Effects to EFH from Site Alternative 1- Lake Union

FMP	Project Action	EFH Determination of Effect
Pacific Coast Salmon	Pile Repair (508 piles) Pile Installation (10 piles) for the small boat dock Accidental spill or leak of hazardous materials	Adverse effect due to construction in nearshore freshwater EFH. However, salmonid use of this part of Lake Union is primarily as a migratory corridor, as these species (Chinook and coho salmon) do not typically use lake habitats as part of their life history. In addition, the existing habitat is degraded. Shading from overwater structures would be similar to existing conditions as this alternative would remove and replace the existing pier within the existing footprint. Due to the limited extent of anticipated in-water activities and absence of HAPC, the extent of potential adverse effects is considered to be less than significant, provided that appropriate mitigation measures are implemented.

EFH=Essential Fish Habitat *FMP=Fisheries Management Plan*

5.8.5.3 Mitigation Measures

In addition to the example measures identified above in Section 5.7.2.3 of this EA, the following types of planning and construction practices could be undertaken on a site-specific basis to conserve salmon EFH in areas with potential to be affected by construction activities:

- Plan development sites to minimize clearing and grading and cut-and-fill activities.
- During construction, temporarily fence setback areas to avoid disturbance of natural riparian vegetation and maintain riparian functions for EFH.
- Use BMPs such as avoiding ground disturbing activities during the wet season; minimizing the time disturbed lands are left exposed; using erosion prevention and sediment control methods; minimizing vegetation disturbance; maintaining vegetation buffers around wetlands, streams, and drainage ways; and avoiding building activities in areas of steep slopes with highly erodible soils.
- Use methods such as sediment ponds, sediment traps, or other facilities to slow water run-off and trap sediment and nutrients.
- Where feasible, remove impervious surfaces from riparian areas and re-establish wetlands.

It is expected that the lessor will satisfy appropriate mitigation measures by following the usual permitting and regulatory requirements.

5.8.6 Site Alternative 2: Port Angeles

5.8.6.1 Existing Environment

Site Alternative 2 is located in Port Angeles Harbor, which has marine and estuarine habitat that is EFH for many species of groundfish and coastal pelagic species. The Port Angeles site is located in USGS hydrologic unit code 17110020 (Dungeness-Elwha) and is designated EFH for Chinook, coho, and pink salmon (PFMC, 1999).

The following EFHs are identified in the project area:

- Pacific Salmon (Chinook, coho, and pink salmon)
- Groundfish
- Coastal Pelagic Species
- Habitat Area of Particular Concern.

5.8.6.2 Environmental Consequences

Table 5.8-5 provides a summary of the project actions that affect EFH at Site Alternative 2.

Table 5.8-5: Summary of Adverse Effects to EFH from Site Alternative 2-Port Angeles

FMP	Project Action	EFH Determination of Effect
Pacific Salmon Pacific Groundfish Coastal Pelagic Species HAPC	Pile Removal (122 piles) Pile Installation (684 piles) Additional dock extended overwater (31,200 sq ft) Dredging (approx. every 20 years) Accidental spill or leak of hazardous materials	Adverse effects due to construction in nearshore marine EFH. Additional overwater structures would be constructed. Dredging would occur initially and in a maintenance routine as the proposed pier is located offshore of the mouth of Tumwater Creek, which creates a delta in the marine nearshore as it deposits sediments from upstream. Last dredging of area was approximately 27 years ago; therefore, frequency is uncertain. Due to the extent of anticipated in-water activities and limited presence of HAPC, the extent of potential adverse effects is considered to be less than significant, provided that appropriate mitigation measures are implemented.

EFH=Essential Fish Habitat
FMP=Fisheries Management Plan
HAPC= Habitat Area of Particular Concern
sq ft=square feet

5.8.6.3 Mitigation Measures

The example measures for pile removal and pile installation for the Port Angeles site would be the same as described in Section 5.7.2.3 of this EA. In addition, if dredging was required every 20 years, then the planning and construction practices for dredging as described in Section

5.7.3.3 of this EA would apply. Finally, incorporating applicable general EFH planning and construction practices to the final design (as listed above in Section 5.8.5.3) would also minimize impacts to EFH.

It is expected that the lessor will satisfy appropriate mitigation measures by following the usual permitting and regulatory requirements.

5.8.7 Site Alternative 3: Bellingham

5.8.7.1 Existing Environment

Site Alternative 3 is located in Bellingham Bay, which has marine and estuarine habitat that is EFH for many species of groundfish and coastal pelagic species. The Bellingham site is located in USGS hydrologic unit code 17110002 (Strait of Georgia) and is designated EFH for Chinook, coho, and pink salmon (PFMC, 1999).

The following EFHs are identified in the project area:

- Pacific Salmon (Chinook, coho, and pink salmon)
- Groundfish
- Coastal Pelagic Species
- Habitat Area of Particular Concern.

5.8.7.2 Environmental Consequences

Table 5.8-6 provides a summary of the project actions that affect EFH at Site Alternative 3:

Table 5.8-6: Summary of Adverse Effects to EFH from Site Alternative 3 - Bellingham

FMP	Project Action	EFH Determination of Effect
Pacific Coast Salmon Groundfish Coastal Pelagic Species HAPC	Pile Removal (22 piles) Pile Installation (54 piles) Bulkhead replacement Additional overwater structure (11,220 sq ft) Accidental spill or leak of hazardous materials	Adverse effect due to construction in nearshore marine EFH. Additional overwater structures would be constructed, but surface area would be a minor addition. The overwater structures to be constructed would be for the small boat moorage and wave attenuator. Dredging does not appear to be necessary in this location. Due to the limited extent of anticipated in-water activities and limited presence of HAPC, the extent of potential effects is considered to be less than significant, provided that appropriate mitigation measures are implemented.

EFH=Essential Fish Habitat
FMP=Fisheries Management Plan
HAPC= Habitat Area of Particular Concern
sq ft= square feet

5.8.7.3 Mitigation Measures

The example measures for pile removal and pile installation at Site Alternative 3 would be the same as described in Section 5.7.2.3 of this EA. In addition, incorporating applicable general EFH planning and construction practices to the final design (as listed above in Section 5.8.5.3) would also minimize impacts to EFH.

It is expected that the lessor will satisfy appropriate mitigation measures by following the usual permitting and regulatory requirements.

5.8.8 Site Alternative 4: Newport

5.8.8.1 Existing Environment

Site Alternative 4 is located in Yaquina Bay, which has marine and estuarine habitat that is EFH for many species of groundfish and coastal pelagic species. The Newport site is located in USGS hydrologic unit code 17100204 (Siletz-Yaquina River) and is designated EFH for Chinook and coho salmon (PFMC, 1999).

The following EFHs are identified in the project area:

- Pacific Salmon (Chinook and coho salmon)
- Groundfish
- Coastal Pelagic Species
- Habitat Area of Particular Concern.

5.8.8.2 Environmental Consequences

Table 5.8-7 summarizes the project actions that affect EFH.

Table 5.8-7: Summary of Adverse Effects to EFH from Site Alternative 4 - Newport

FMP	Project Action	EFH Determination of Effect
Pacific Coast Salmon Groundfish Coastal Pelagic Species HAPC	Pile Removal (194 piles) Pile Installation (1102 piles) Additional overwater structure (41,250 sq ft) Dredging (approx. every 10 years) Accidental spill or leak of hazardous materials	Adverse effect due to construction in nearshore marine EFH. Additional overwater structures would be constructed. Due to the extent of anticipated in-water activities and limited presence of HAPC, the extent of potential adverse effects is considered to be less than significant, provided that appropriate mitigation measures are implemented.

EFH=Essential Fish Habitat
FMP=Fisheries Management Plan
HAPC= Habitat Area of Particular Concern
sq ft= square feet

5.8.8.3 Mitigation Measures

The example measures for pile removal and pile installation for the Newport site would be the same as described in Section 5.7.2.3 of this EA. Planning and construction practices recommended for dredging are described in Section 5.7.3.3 of this EA and would apply to minimize impacts to EFH. Finally, incorporating applicable general EFH planning and construction practices to the final design (as listed above in Section 5.8.5.3) would also minimize impacts to EFH.

It is expected that the lessor will satisfy appropriate mitigation measures by following the usual permitting and regulatory requirements.

5.9 WETLANDS AND NAVIGABLE WATERS

A jurisdictional wetland is one that meets three criteria: (1) a water table at or near the surface, (2) the presence of hydric soils, and (3) the presence of hydrophytic vegetation. Field evaluations were performed at all alternative sites using the USACE wetlands delineation manual (USACE, 1987) in conjunction with the interim regional supplement for the Western Mountains, Valley and Coast Region (USACE, 2008). The recently adopted regional supplement provides technical guidance and procedures specific to the non-arid west. Proposed federal actions in wetlands are regulated under Section 404 of the CWA and EO 11990: *Protection of Wetlands*, which requires federal agencies to avoid to the extent possible the long and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative.

Under Section 10 of the Rivers and Harbors Appropriation Act of 1899 (33 USC 403 Chapter 425), commonly known as the Rivers and Harbors Act of 1899 (RHA), the building of any wharfs, piers, jetties, and other structures is prohibited without Congressional approval, and excavation or fill within navigable waters requires the approval of the Chief of Engineers, USACE Regulatory Branch. USFWS review and comment on the effects on fish and wildlife of activities proposed under a permit from the USACE is also provided under the Fish and Wildlife Coordination Act (16 USC 661-667e) (USFWS, 2009a). Depending on the scope of activities, a Section 10 Permit from USACE can be authorized via a standard individual permit, letter-of-permission, nationwide permit, or regional permit. USACE would make the determination on what type of permit is needed.

a) Washington

Within the state of Washington, the proposed NOAA action would require multiple permits from several agencies. A Joint Aquatic Resource Permit Application (JARPA) to the USACE, WDOE

and local government would be required. JARPA review simultaneously covers federal, state and local permits. Federal permits addressed include Section 10 under the RHA and Section 404 under the CWA from the USACE, and if necessary, Section 9 of the RHA (Bridge Permits) from the U.S. Coast Guard. State of Washington permits covered include 401 Water Quality Certification from the WDOE, and if necessary, an Aquatic Resource Use Authorization from the WDNR and Hydraulic Project Approvals by the WDFW. Local permits covered include Shoreline Management Act (coastal zone review) permits, and if necessary, permits for Development Exemptions Critical Areas Ordinance (Graff, no date).

JARPA submittals must include a clear development plan attached to a completed JARPA application form. On January 12, 2009 the Washington Governor's Office of Regulatory Assistance issued a revised JARPA application for that state, which is available on-line (Washington Governor's Office, 2009a). In addition to project plans, Washington port developers, if selected, must include other environmental permits, supporting NEPA studies, and documentation under SEPA. At a minimum, a SEPA checklist would be required and must be completed before state and federal permits can be issued (WDOE, 2009c). Depending on the scope of the port plans to implement the proposed action, coordination with the local WDFW Area Habitat Biologist may be required. Processing time for individual permits under JARPA can range from 6 to 24 months. Nationwide permits are usually processed within 3 to 6 months, though it can take up to 12 months. The time frame is dependant on the complexity of the impacts on aquatic resources, endangered species, archeological or tribal concerns, and workload (Washington Governor's Officer, 2009b).

b) Oregon

Within the state of Oregon, projects requiring the removal or fill of 50 cubic yards or more of material in waters of the state would require separate permits from the Oregon Department of State Lands (ODSL) under the Oregon Fill Removal Act and the USACE under Section 10 of the RHA and Section 404/401 of the CWA. ODSL administers the Removal-Fill Permit Program (ORS 196.800-196.990) and the USACE permit is administered through its Regulatory Branch.

To streamline the process for reviewing permit applications for fill and removal permits, the ODSL, the DLCD and the USACE have designed a joint permit form designed to be used in applying for both the federal and state permits. This joint application still requires the applicant to obtain separate authorizations, and copies of the completed Joint Application Form should be sent to both ODSL and the USACE. The form cannot be submitted until the local county planning department has reviewed and signed it. Once submitted, the application must be reviewed for completeness by ODSL within 30 days of receipt. Once all of the information on the checklist is provided a permit decision is made within 90 days (ODSL, 2009).

5.9.2 No-Action Alternative

5.9.2.1 Existing Environment

The No-Action Alternative assumes continuation of upland activities at the existing MOC-P site on Lake Union, and continuation of water-based activities (ship berthing, etc) at various temporary locations around Lake Union and the Seattle area, as described in Section 4.3 above. The existing environment of the Lake Union area in relation to wetlands is described more fully in Section 5.9.2.1 below.

5.9.2.2 Environmental Consequences

No construction or other alteration of the existing environmental conditions would occur under the No-Action Alternative. Therefore no project-related impacts to wetlands would be expected to occur under the No-Action Alternative. No JARPA submittal would be required. Effects of existing land uses would continue.

5.9.2.3 Mitigation Measures

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

5.9.3 Site Alternative 1: Lake Union

5.9.3.1 Existing Environment

National Wetland Inventory materials (USFWS, 2009b) do not have a record of wetlands on the Lake Union site. A field visit confirmed that there are no wetlands on this site. The site is primarily paved. Soils with seasonally standing water and hydrophytic plants are absent.

5.9.3.2 Environmental Consequences

No wetlands are located on the Lake Union site; therefore, no project-related impacts to wetlands would be expected to occur under this alternative.

Pile stubbing and installation of piling extensions may be necessary within waters of the U.S. and state of Washington; hence, a JARPA should be completed and submitted for coordination with the USACE under Section 10 of the RHA regarding navigation and sections 404 and 401 of the CWA, the WDOE and locally affected governments regarding water quality.

5.9.3.3 Mitigation Measures

No mitigation measures are recommended in relation to wetlands for Site Alternative 1.

A JARPA should be completed and submitted for coordination with the USACE under Section

10 of the RHA and sections 404 and 401 of the CWA, the WDOE and locally affected governments.

5.9.4 Site Alternative 2: Port Angeles

5.9.4.1 Existing Environment

National Wetland Inventory materials (USFWS, 2009b) do not have a record of wetlands on the Port Angeles site. A field visit confirmed that there are no wetlands on this site. The site is primarily paved. Soils with seasonally standing water and hydrophytic plants are absent.

5.9.4.2 Environmental Consequences

No wetlands are located on the Port Angeles site; therefore, no project-related impacts to wetlands would be expected to occur under this alternative.

Removal and installation of pilings may be necessary within waters of the U.S. and state of Washington; hence, a JARPA should be completed and submitted for coordination with the USACE under Section 10 of the RHA regarding navigation and sections 404 and 401 of the CWA, the WDOE and locally affected governments regarding water quality.

5.9.4.3 Mitigation Measures

No mitigation measures are recommended in relation to wetlands for Site Alternative 2.

A JARPA should be completed and submitted for coordination with the USACE under Section 10 of the RHA and sections 404 and 401 of the CWA, the WDOE and locally affected governments.

5.9.5 Site Alternative 3: Bellingham

5.9.5.1 Existing Environment

National Wetland Inventory materials do not have a record of wetlands on the Bellingham site (USFWS, 2009b). A field visit confirmed that there are no wetlands on this site. The site is primarily paved. Soils with seasonally standing water and hydrophytic plants are absent.

5.9.5.2 Environmental Consequences

No wetlands are located on the Bellingham site; therefore, no project-related impacts to wetlands would be expected to occur under this alternative.

Removal and installation of pilings may be necessary within waters of the U.S. and state of Washington; hence, a JARPA should be completed and submitted for coordination with the

USACE under Section 10 of the RHA regarding navigation and sections 404 and 401 of the CWA, the WDOE and locally affected governments regarding water quality.

5.9.5.3 Mitigation Measures

No mitigation measures are recommended in relation to wetlands for Site Alternative 3.

A JARPA should be completed and submitted for coordination with the USACE under Section 10 of the RHA and sections 404 and 401 of the CWA, the WDOE and locally affected governments.

5.9.6 Site Alternative 4: Newport

5.9.6.1 Existing Environment

The Newport site contains two features that exhibit some wetland conditions including hydrophytic vegetation and hydrology. One feature is a former harvest room waste water pond that collected waste water from the now-defunct fish farm. A small amount of water was observed pooled at the bottom of the pond. At the time of the site visit in early March 2009, no vegetation was observed in the bottom of this pond. Plants such as dock (*Rumex* sp.) and atriplex (*Atriplex* sp.) were observed on the side slopes.

The other feature on the Newport site is a former fish-rearing pond. This feature has a paved bottom which has accumulated sediment over the top. Hydrophytic vegetation, including saltgrass (*Distichlis spicata*) and brass buttons (*Cotula coronopifolia*), was observed growing on this sediment.

Both of these features drain to Yaquina Bay. Since they are man-made, excavated from uplands, and less than one acre, the Oregon Department of State Lands and the USACE are not expected assume jurisdiction over these features as regulated wetlands (OAR 141-085-0515[7]).

5.9.6.2 Environmental Consequences

Both man-made features evaluated above would be filled. These are artificial features that provide little hydrologic or habitat value. They are expected to be considered non-jurisdictional and not require permits to fill.

Removal and installation of pilings and dredging for adequate berth depths may be necessary within waters of the U.S. and state of Oregon; hence, coordination with the USACE under Section 10 of the RHA regarding navigation and Sections 404 and 401 of the CWA regarding water quality would be required. Coordination with Oregon regulators per the Oregon Removal Fill Law would also be required.

5.9.6.3 Mitigation Measures

No mitigation measures are recommended in relation to wetlands for Site Alternative 4.

The proposed project would require review and approval under the state of Oregon Removal Fill Law (ORS 196.800 through 196.990), Section 10 of the RHA and Sections 404 and 401 of the CWA. The OSL, the DLCD and the USACE have designed a streamlined process for reviewing permit applications for fill and removal permits. Their joint permit form is submitted after the local county planning department has reviewed and signed it.

5.10 FLOODPLAINS

The 100-year floodplain is an area with a flood elevation that has a one percent chance of being equaled or exceeded each year. Although the name implies such a flood every 100 years, in reality, a 100-year flood could occur in any year. Under EO 11988: *Floodplain Management*, structures should not be located within the 100-year floodplain, or, if that is unavoidable, structures should be built so that the finished floor elevation is above the 100-year flood elevation as determined by the Federal Emergency Management Agency (FEMA) and depicted on their Flood Insurance Rate Maps (FIRMs), or should be flood-resistant. Floodplain management is intended to minimize the potential for property damage and to maintain functions of the hydrologic cycle.

Flooding from storm surge can also occur in coastal areas. Storm surge is the onshore build-up of sea or lake water caused primarily by high winds associated with a low pressure weather system and secondarily by the low barometric pressure of the storm (NOAA, 2009b). While large storm surges are usually associated with tropical cyclones, smaller storm surges can also be associated with low pressure weather systems in temperate areas, such as the Pacific Northwest.

5.10.1 No-Action Alternative

5.10.1.1 Existing Environment

The existing MOC-P facility is located on the eastern shoreline of Lake Union, on a flat, filled area at the base of a steep slope rising to 200 feet above MSL. The eastern upland boundary of the site is approximately 42 feet above MSL, while the Lake Union shoreline is approximately 27 feet above MSL.

Flood zones identified from the FEMA FIRM map (Map Number 53033C0340 F) indicates that the entire site and surrounding areas (including Lake Union) are within Zone X, an area determined to be outside the 500-year floodplain (refer **Appendix E-1**).

Storm surge is not considered to be a factor at the site, given the limited fetch of Lake Union and its location above the Hiram M. Chittenden Locks (a.k.a the Ballard Locks) within the Lake Washington Ship Canal.

5.10.1.2 Environmental Consequences

There would be no change to existing site conditions under the No-Action Alternative. The site is located outside the 500-year floodplain, therefore there would be no impacts in relation to floodplains. The No-Action Alternative would be consistent with EO 11988.

5.10.1.3 Mitigation Measures

No mitigation measures with respect to floodplains are recommended under the No-Action Alternative.

5.10.2 Site Alternative 1: Lake Union

5.10.2.1 Existing Environment

The existing environment is the same as described in Section 5.5.1.1 under the No-Action Alternative, as both the No Action and Site Alternative 1 are located at the same site on Lake Union.

5.10.2.2 Environmental Consequences

The proposed action at Site Alternative 1 consists of reconstructing the fire-damaged buildings, piers and wharf at the site, as well as renovations to the existing (non-damaged) buildings. No major earthwork or site changes are proposed that would impact the potential for flooding on the site. The site is located outside of the 500-year floodplain, therefore there would be no impacts in relation to floodplains. Site Alternative 1 would be consistent with EO 11988.

The site is unlikely to be impacted by storm surge during large storm events.

5.10.2.3 Mitigation Measures

No mitigation measures with respect to floodplains are recommended for the proposed action at Site Alternative 1.

5.10.3 Site Alternative 2: Port Angeles

5.10.3.1 Existing Environment

The site is located on the southern shoreline of Port Angeles Harbor, on a flat, partially filled area, approximately 500 feet north of a steep coastal terrace rising to approximately 200 feet

elevation. Upland areas of the site are generally flat at an elevation of approximately 17 feet above MSL, except for the coastal edge, which slopes steeply down to the water level. Tumwater Stream flows along the eastern boundary of the site, discharging into the harbor.

Flood information obtained from the FEMA FIRM map (Community Panel 530023 0003C) indicates that the majority of upland areas on the site are within Zone C, an "area of minimal flooding," as shown in **Appendix E-2**. The adjacent Port Angeles Harbor and coastal edges of the site are identified as being within Zone V2, which includes special flood hazard areas subject to inundation from the one percent annual chance flood event, with velocity (wave action) for which base flood elevations and flood hazard factors have been determined. In the vicinity of the site, the base flood elevation for this zone is 11 feet above the National Geodetic Vertical Datum of 1929 (NGVD). A small area near the southeast corner of the site (associated with Tumwater Creek) is identified as being within Zone A2, which includes special flood hazard areas subject to inundation from the one percent annual chance flood event, for which base flood elevations and flood hazard factors have been determined. At this particular location, the base flood elevation has been determined as 14 feet NGVD. A larger area to the west of the A2 Zone (along Marine Drive and adjacent areas of the site to the north of this, including the adjacent Texaco site) is identified as being within Zone B, which includes areas between the limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. There is no base flood elevation associated with this Zone B area.

No information on historical storm surge data was available for the Port Angeles area. On March 3, 1999, a storm surge of 4.6 feet was observed near Ocean Shores, Washington, approximately 90 miles southwest of Port Angeles, on the open coast (WDOE, 2009b). The magnitude of storm surge at Port Angeles is likely to be less than at Ocean Shores, due to its location within Port Angeles Harbor and the Strait of Juan de Fuca, however storm surge is likely to be present within the harbor to some degree during large storm events.

5.10.3.2 Environmental Consequences

The proposed action at Site Alternative 2 involves the construction of several buildings, the proposed location of which are within the area of minimal flooding (Zone C) on the FEMA FIRM maps. As such, the effects of flooding on the proposed structures are considered to be negligible and would be consistent with EO 11988.

Proposed actions within Zone A2 (associated with Tumwater Creek) would not involve habitable structures and Zone B is outside of the 100-year floodplain, consistent with EO 11988. Anticipated actions within these areas, generally located at the southeast of the site, include car

parking areas and landscaping, which would have a negligible impact on the floodplain. If the proposed site layout changes and structures are proposed within the Zone A2, potential impacts on the floodplains and the structures may result.

Proposed actions within the Zone V2 include the proposed pier extension of Terminal 3. Given that this area is within the 100-year floodplain and is subject to velocity (wave action), there is potential for the proposed structure to be impacted by flooding, and for the structure to affect the characteristics of flooding in the area, by altering the way in which floodwaters and waves circulate. Finished floor elevation of the pier deck extension would be above the published 100-year flood elevation if over 11 feet above NGVD.

The site has potential to be affected by storm surge during large storm events, however the magnitude of the surge is likely to be somewhat abated by the protection of Ediz Hook.

5.10.3.3 Mitigation Measures

Site Alternative 2 appears to be within a base flood plain. The lessor must ensure compliance with the requirements of the SFO as it pertains to base floodplains and consistency with Executive Order 11988.

5.10.4 Site Alternative 3: Bellingham

5.10.4.1 Existing Environment

The site is relatively flat with an existing ground surface approximately 15 feet above MSL. There are no streams or other water bodies on or adjacent to the site, except for Bellingham Bay and the Whatcom Waterway, an approximately 1-mile-long artificial channel that leads from the mouth of Whatcom Creek to Bellingham Bay.

Flood information obtained from the FEMA FIRM map (Map Number 530073 1651D) indicates that the indicates that the majority of the site is within Zone X, an area determined to be outside of the 0.2 percent annual chance flood plain (refer **Appendix E-3**). The adjacent Whatcom Waterway, Log Pond and coastal edges of the site are identified as being within Zone A which includes special flood hazard areas subject to inundation from the one percent annual chance flood event, but for which no base flood elevations have been determined (Zone A). FIRM Panel 1213D shows a base flood elevation at the mouth of Whatcom Creek of 8 feet NGVD. This elevation represents a conservatively high 100-year flood elevation of between 12 and 13 feet above MLLW (RETEK Group, 2007).

Historic storm surge data for Bellingham indicates that a storm surge of up to 0.8 feet occurred in the vicinity of the site during a large storm event in January 1975 (Nobeltec, 2004).

5.10.4.2 Environmental Consequences

The proposed action for Site Alternative 3 is not anticipated to alter site elevations or the flow characteristics of Bellingham Bay or nearby waterways, and is not within the 100-year floodplain, except for in-water work such as the wave attenuator, small vessel dock and mooring dolphins. Such in-water structures are not considered "habitable" and, therefore, not applicable to EO 11998. As discussed in Section 5.4.4 of this EA, the proposed action is anticipated to provide improved maintenance of storm water runoff utilities. Therefore the proposed alternative would have negligible effects on floodplains and flooding characteristics within the site vicinity.

With respect to the likelihood of the proposed action being affected by flooding, the site is not within an identified floodplain. As such, the proposed alternative is unlikely to be affected by land-based flooding, but has potential to be affected by storm surge during large storm events.

5.10.4.3 Mitigation Measures

No mitigation measures with respect to floodplains are recommended for the proposed action at Site Alternative 3.

5.10.5 Site Alternative 4: Newport

5.10.5.1 Existing Environment

The site is located on the southern shore of Yaquina Bay. The site is generally flat, although the northern portion of is terraced approximately six feet lower than the southern portion, ranging from 14 feet to 20 feet MSL.

Flood information obtained from the FEMA FIRM map (Community Panel 410131 0002C) indicates that the majority of the site is within Zone C, an "area of minimal flooding", as shown in **Appendix E-4**. The adjacent Yaquina Bay and coastal edges of the site are identified as being within Zone A2 which includes special flood hazard areas subject to inundation from the one percent annual chance flood event, for which base flood elevations and flood hazard factors have been determined. At this particular location, the base flood elevation has been determined as nine feet NGVD. A small area within the northwest corner of the site is identified as being within Zone B, which includes areas between the limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood.

Storm surges along the Oregon coast are relatively small (less than 6 feet 8 inches) with differences in surge magnitude along the coast dependent on the degree of open ocean exposure and local morphology. During storm events in November 1998 and February 2006, surge

heights measured at South Beach, Newport were less than three feet, when surges at more exposed locations were more than four feet (Moritz and Moritz, 2008). Given the site's location within Yaquina Bay, it is expected that storm surge at the site would be less than at South Beach.

5.10.5.2 Environmental Consequences

The proposed action at Site Alternative 4 involves major earthworks to level the site and remove the existing fish farm infrastructure. This may impact the boundaries of the 100- and 500-year floodplains. The final elevation of the finished (post-earthworks) site is unknown; however, any area with an elevation less than 9 feet above NGVD would be within the 100-year floodplain (i.e., Zone A2) and could affect floodplain values under EO 11988.

The proposed action includes the construction of several buildings, the majority of which are within the current area of minimal flooding (Zone C) on the FEMA FIRM maps, however some of which (the contractor's building and possibly the boat shed) are located within the current area of Zone B (between the 100- and 500-year floodplains). These buildings, particularly those within the Zone B area, may be subject to flooding, particularly if earthworks lower the elevation of the site. None of these structures lie within the 100-year floodplain and would be consistent with EO 11988, provided earthworks do not lower the land elevation to below nine feet NVGD.

The proposed dock would be within the 100-year flood plain (Zone A2), and is therefore likely to be impacted by flooding, particularly if the finished level of the dock is below an elevation of nine feet NGVD. Additionally, there is some potential for the structure to affect the characteristics of flooding in the area, by trapping debris against the piles of the dock and/or altering the way in which floodwaters circulate/flow within the bay.

The site has potential to be affected by storm surge during large storm events.

5.10.5.3 Mitigation Measures

Site Alternative 4 appears to be within a base flood plain. The lessor must ensure compliance with the requirements of the SFO as it pertains to base floodplains and consistency with Executive Order 11988.

5.11 COASTAL ZONE MANAGEMENT

Congress passed the federal Coastal Zone Management Act (CZMA) in 1972 to encourage the appropriate development and protection of the nation's coastal and shoreline resources. The CZMA gives states the primary role in managing these areas. To assume this role, the state prepares a Coastal Zone Management Program (CZMP) document that describes the state's coastal zone, its resources and how these resources are managed. Under federal consistency

provisions of the CZMA, federal activities having the potential to impact coastal resources within a coastal zone must be consistent, to the maximum extent practicable, with approved state CZMP.

Federal consistency requirements are described in Section 307 of the CZMA and at 15 CFR Section 930. There are three categories of activities which trigger a federal consistency review: 1) activities undertaken by a federal agency, 2) activities which require federal approval and 3) activities which use federal funding. The federal consistency process and enforceable polices for approved coastal programs within the states of Washington and Oregon are each described below. Under the proposed action, the lessor would prepare detailed plans and acquire local, state and federal permits and approvals, including review under the applicable CZMP process, after award of a lease by NOAA. Once the leased facility is constructed, NOAA would operate its MOC-P facility under the terms of that lease.

Formal CZMP coordination has not been initiated because a site location has not been selected and preliminary plans have not progressed beyond a conceptual layout. The lessor would coordinate review under the applicable CZMP. For the purpose of NOAA's site-selection and subsequent MOC-P operation, the applicable enforceable policies and anticipated measures to attain a consistency determination are considered for each Site Alternative and are discussed in the following subsections of this EA.

a) Washington

Washington was the first state to receive federal approval of a CZMP in 1976. The WDOE Shorelands and Environmental Assistance Program is responsible for implementing Washington's CZMP. Washington's coastal zone includes 15 counties with marine shorelines: Clallam, Grays Harbor, Island, Jefferson, King, Kitsap, Mason, Pacific, Pierce, San Juan, Skagit, Snohomish, Thurston, Wahkiakum, and Whatcom counties. Under Washington's CZMP, federal activities that affect any land use, water use or natural resource of the coastal zone must comply with the enforceable policies within the six laws identified in the CZMP document (WDOE, 2001). The six laws are the:

- Shoreline Management Act (SMA) and local Shoreline Master Programs (SMPs) (e.g., King County Shoreline Management Master Plan)
- State Environmental Policy Act (SEPA)
- Clean Water Act (CWA)
- Clean Air Act (CAA)
- Energy Facility Site Evaluation Council (EFSEC)

- Ocean Resource Management Act (ORMA)

The lessor would fund, plan and initiate site development and lease property and facilities located within the coastal zone, and would coordinate CZMP review for those activities. NOAA actions include site selection, staff relocation and MOC-P operations and maintenance, for which the federal consistency process under the Washington CZMP would be triggered. Potential NOAA actions within the Washington coastal zone are evaluated below against six laws and in support of a "federal consistency certification."

b) Oregon

The state of Oregon also has a federally approved CZMP which falls under the authority of the Oregon DLCD pursuant to Section 306(c)(5) of the CZMA and ORS 196.435. The Oregon coastal zone includes entire watersheds that flow directly to the coast and encompass the state's territorial sea extending three nautical miles offshore. All activities, including MOC-P operation, directly affecting the coastal zone must be undertaken in a manner consistent to the maximum extent practicable with the Oregon Coastal Management Program (OCMP). Potential NOAA actions within the Oregon coastal zone are evaluated below.

For future site development by a non-federal entity within the coastal zone, the DLCD and OCMP would be notified. At that time, applicable comprehensive plan standards for affected coastal cities and counties would be reviewed against detailed design plans. This includes consistency with coastal city and county comprehensive plans and land use regulations approved by the DLCD (e.g., Yaquina Bay Estuary Management Plan), and with various state agency authorities (e.g., land use planning statutes, the Oregon Territorial Sea Plan, the Removal-Fill Law, water quality standards, the Oregon Beach Bill). OCMP enforceable policy also includes state polices that are legally binding through constitutional provisions, laws, regulations, land use plans, ordinances, or judicial or administrative decisions, by which a state exerts control over private and public land and water uses and natural resources in the coastal zone, as defined in 16 USC 1453(6)(a); 15 CFR 930.11(h).

DLCD reviews involve consultation with local governments, state agencies, federal agencies, and other interested parties in determining project consistency with the OCMP. The OCMP consistency determination process is based on a detailed description of the proposed activity; a discussion of anticipated coastal zone effects; and an evaluation of the activity and effects in light of the enforceable policies. The consistency determination includes: a brief statement indicating whether the project is consistent to the maximum extent practicable, how the proposed activity would be undertaken in a manner consistent to the maximum extent practicable with the OCMP; and justification of the agency's determination of consistency, in light of all relevant provisions of the OCMP.

5.11.2 No-Action Alternative

5.11.2.1 Existing Environment

No project-specific federal leasing would occur under the No-Action Alternative. Hence, existing federal or leased facilities would be used in an ad-hoc fashion to accomplish the MOC-P mission. No new MOC-P development actions within the coastal zone would occur.

5.11.2.2 Environmental Consequences

No federally funded action within the coastal zone would occur under the No-Action Alternative. No new effects to coastal resources would result. Review by WDOE coastal zone program would not be required and a consistency determination would not be necessary.

5.11.2.3 Mitigation

No mitigation measures in relation to Coastal Zone Management are recommended for the No-Action Alternative.

5.11.3 Site Alternative 1: Lake Union

5.11.3.1 Existing Environment

The proposed action under Site Alternative 1 is located in King County, which lies within the Washington State coastal zone. The project is subject to review under the WDOE Shorelands and Environmental Assistance Program and its enforceable policies, state Shoreline Management Act, the King County Shoreline Management Master Plan, and other state and local regulations.

The existing environment for this Site Alternative is described within this EA for key resource topics or environmental conditions (refer to various other parts of Section 5, in relation to Site Alternative 1).

5.11.3.2 Environmental Consequences

The proposed action at this Site Alternative is subject to review under SEPA. Once a site has been selected by NOAA, the lessor would prepare more detailed planning document for coordination with regulatory agencies and preparation of a Washington SEPA document. Unless the WDOE concurs with a DNS, a SEPA Environmental Impact Statement would be prepared by the lessor (this process is separate from and should not be confused with requirements for preparation of an EIS under NEPA). In this case the WDOE would identify areas of research and examination, determine the content and organization of the document, coordinate scoping, and ensuring that all substantive agency and technical information is made available. While the proposed action involves a federal lease and NOAA action (MOC-P operations), the SEPA

processes must occur after the NEPA process due to the timing of decision-making by NOAA and the subsequent development of design information by the lessor for regulatory agency review and permitting.

The proposed action is expected to conform to policies and regulations found under the state of Washington SMA, including local government SMPs prepared under that Act. The Washington SMA was adopted in a 1972 referendum "to prevent the inherent harm in an uncoordinated and piecemeal development of the state's shorelines." Based on the analysis contained in various sections of this EA, the proposed action is expected to adheres to the state SMA's three broad policies: (1) development of water-dependent uses consistent with control of pollution and prevention of damage to the natural environment, (2) protection of shoreline natural resources, and (3) accommodating public access to the greatest extent feasible.

Based on the impact analysis and mitigation measures identified within this EA, the proposed action is expected to conform to policies and regulations for elements found in the King County Shoreline Management Master Plan and applicable to Site Alternative 1 at Lake Union in King County. Applicable elements are outlined on the King County website (King County, 2009a), and include:

- Shoreline Use
- Economic Development
- Public Access
- Conservation
- Recreation
- Historical/Cultural
- Circulation
- Residential Use

The proposed action would be consistent with the King County Shoreline Management Master Plan (SMMP). The proposed action under Site Alternative 1 is located within a designated Urban Environment, an area designed to ensure optimum utilization of shorelines within urbanized areas by permitting intensive use by a multiplicity of urban activities. The proposed action is expected to be consistent with the SMMP's policy of increasing utilization and efficiency of urban areas, including its emphasis on development within already developed areas and priority for shoreline dependent and water oriented uses over other uses, while considering air and water quality, aesthetic and other effects on the environment (King County, 1978).

The proposed action would be consistent with ORMA. The selected site would be planned and evaluated in a manner that would allow state and local management authority over Washington's coastal waters, seabed, and shorelines to be exercised. No leasing of Washington's tidal or submerged lands would occur for purposes of oil or gas exploration, development, or production. The project is not likely to have an adverse impact on renewable resources or discourage state polices for the conservation of liquid fossil fuels, and exploration of available methods of encouraging such conservation.

As required under ORMA, a demonstrated significant local, state, or national need for the proposed activity exists, and no likely long-term significant adverse impacts to coastal or marine resources or uses would result. The activity would comply with all applicable local, state, and federal laws and regulations.

Finally, as discuss in various sections of this EA, the proposed action would conform to applicable sections of the CWA and CAA. The EFSEC is not applicable to the proposed action.

5.11.3.3 Mitigation

The following mitigation measures in relation to coastal zone management are recommended for the proposed action at Site Alternative 1:

- The Washington State coastal program's federal consistency coordinator should be consulted for review under the WDOE CZMP application process.

Mitigation measures appropriate for the proposed action at this Site Alternative in relation to other resource topics or environmental conditions are summarized in Section 7 of this EA.

It is expected that the lessor will satisfy appropriate mitigation measures by following the usual permitting and regulatory requirements.

5.11.4 Site Alternative 2: Port Angeles

5.11.4.1 Existing Environment

The proposed action for Site Alternative 2 is located within Clallam County and lies within the Washington State coastal zone. The project is subject to review under the WDOE Shorelands and Environmental Assistance Program and its enforceable policies, state Shoreline Management Act, and other state and local regulation. No local shoreline master plan is available for Clallam County.

The existing environment for this Site Alternative is described within this EA for key resource topics or environmental conditions (refer to various other parts of Section 5, in relation to Site Alternative 2).

5.11.4.2 Environmental Consequences

The proposed action at this Site Alternative is subject to review under SEPA. Once a site has been selected by NOAA, the lessor would prepare more detailed planning document for coordination with regulatory agencies and preparation of a Washington SEPA document. Unless the WDOE concurs with a DNS, a SEPA Environmental Impact Statement would be prepared. (This process is separate from and should not be confused with requirements for preparation of an EIS under NEPA.)

It is expected that the selected port, or a local or state government entity other than the WDOE, would prepare an EIS under SEPA. In this case the WDOE would identify areas of research and examination, determine the content and organization of the document, coordinate scoping, and ensuring that all substantive agency and technical information is made available. While the proposed action involves a federal lease and NOAA action (MOC-P operations), the SEPA processes must occur after the NEPA process due to the timing of decision-making by NOAA and the subsequent development of design information by the lessor for regulatory agency review and permitting.

The proposed action is expected to conform to policies and regulations found under the state's SMA, including local government SMPs prepared under that Act. The Washington SMA was adopted in a 1972 referendum "to prevent the inherent harm in an uncoordinated and piecemeal development of the state's shorelines." Based on the analysis contained in various sections of this EA, the proposed action is expected to adhere to the following three broad policies within the state's SMA: (1) development of water-dependent uses consistent with control of pollution and prevention of damage to the natural environment, (2) protection of shoreline natural resources, and (3) accommodating public access to the greatest extent feasible.

The proposed action would be consistent with ORMA. If selected, actions at this site would be planned and evaluated in a manner that would allow state and local management authority over Washington's coastal waters, seabed, and shorelines to be exercised. No leasing of Washington's tidal or submerged lands would occur for purposes of oil or gas exploration, development, or production. The project is not likely to have an adverse impact on renewable resources or discourage state polices for the conservation of liquid fossil fuels, and exploration of available methods of encouraging such conservation.

There exists a demonstrated significant local, state, or national need for the proposed activity and no likely long-term significant adverse impacts to coastal or marine resources or uses would result. The activity would comply with all applicable local, state, and federal laws and regulations.

Finally, as discuss in various sections of this EA, the proposed action would conform to applicable sections of the CWA and CAA. The EFSEC is not applicable to the proposed action.

5.11.4.3 Mitigation

The following mitigation measures in relation to coastal zone management are recommended for the proposed action at Site Alternative 1:

- The Washington State coastal program's federal consistency coordinator should be consulted for review under the WDOE CZMP application process.

Mitigation measures appropriate for the proposed action at this Site Alternative in relation to other resource topics or environmental conditions are summarized in Section 7 of this EA.

It is expected that the lessor will satisfy appropriate mitigation measures by following the usual permitting and regulatory requirements.

5.11.5 Site Alternative 3: Bellingham

5.11.5.1 Existing Environment

The proposed action under Site Alternative 1 is located within Whatcom County and lies within the Washington State coastal zone. The project is subject to review under the WDOE Shorelands and Environmental Assistance Program and its enforceable policies, Washington State Shoreline Management Act, the Whatcom County Shoreline Management Program, and other state and local regulations.

The existing environment for this Site Alternative is described within this EA for key resource topics or environmental conditions (refer to various other parts of Section 5, in relation to Site Alternative 3).

5.11.5.2 Environmental Consequences

The proposed action at this Site Alternative is subject to review under SEPA. Once a site has been selected by NOAA, the port would prepare more detailed planning document for coordination with regulatory agencies and preparation of a Washington SEPA document. Unless the WDOE concurs with a DNS, a SEPA Environmental Impact Statement would be prepared. This SEPA process is separate from, and should not be confused with, requirements for preparation of an EIS under NEPA.

It is expected that the selected port, or a local or state government entity other than the WDOE, would prepare an EIS under SEPA. In this case the WDOE would identify areas of research and examination, determine the content and organization of the document, coordinate scoping, and

ensuring that all substantive agency and technical information is made available. While the proposed action involves a federal lease and NOAA action (MOC-P operations), the SEPA processes must occur after the NEPA process due to the timing of decision-making by NOAA and the subsequent development of design information by the selected port for regulatory agency review and permitting.

The proposed action is expected to conform to policies and regulations found under the state of Washington SMA, including local government SMPs prepared under that Act. The Washington SMA was adopted in a 1972 referendum "to prevent the inherent harm in an uncoordinated and piecemeal development of the state's shorelines." Based on the analysis contained in various sections of this EA, the proposed action is expected to adheres to the state SMA's three broad policies: (1) development of water-dependent uses consistent with control of pollution and prevention of damage to the natural environment, (2) protection of shoreline natural resources, and (3) accommodating public access to the greatest extent feasible.

Based on the impact analysis and mitigation measures identified within this EA, the proposed action is expected to conform to the Whatcom County SMP General Policies and Regulations applicable to Site Alternative 3 at the Port of Bellingham. These applicable policies are outlined on the Whatcom County website (Whatcom County, 2009), and include:

- Land Use
- Ecological Protection & Critical Areas
- Water Quality and Quantity
- Views and Aesthetics
- Vegetation Conservation
- Archaeological, Historic and Cultural Resources
- Public Access
- Landfill and Excavation
- Forest Practices
- Shoreline Area Regulations
- Shoreline Bulk Provisions: Buffers, Setbacks, Height and Open Space

The proposed action would be consistent with the Whatcom County SMP (Whatcom County Planning & Development Services, 2008). In particular, it would not result in a substantive net

loss of shoreline ecological functions and would include mitigation to avoid, minimization, or compensation for project-specific and cumulative impacts.

The proposed action would be consistent with ORMA. The selected site would be planned and evaluated in a manner that would allow state and local management authority over Washington's coastal waters, seabed, and shorelines to be exercised. No leasing of Washington's tidal or submerged lands would occur for purposes of oil or gas exploration, development, or production. The project is not likely to have an adverse impact on renewable resources or discourage state polices for the conservation of liquid fossil fuels, and to explore available methods of encouraging such conservation. There exists a demonstrated significant local, state, or national need for the proposed activity and no likely long-term significant adverse impacts to coastal or marine resources or uses would result. The activity would comply with all applicable local, state, and federal laws and regulations.

Finally, as discussed in various sections of this EA, the proposed action would conform to applicable sections of the CWA and CAA. The EFSEC is not applicable to the proposed action.

5.11.5.3 Mitigation

The following mitigation measures in relation to coastal zone management are recommended for the proposed action at Site Alternative 3:

- The Washington State coastal program's federal consistency coordinator should be consulted regarding review under the WDOE CZMP application process.

Mitigation measures appropriate for the proposed action at this Site Alternative in relation to other resource topics or environmental conditions are summarized in Section 7 of this EA.

It is expected that the lessor will satisfy appropriate mitigation measures by following the usual permitting and regulatory requirements.

5.11.6 Site Alternative 4: Newport

5.11.6.1 Existing Environment

The proposed action under Site Alternative 4 is located within Lincoln County and lies within the Oregon State coastal zone. Per the OCMP, the project is subject to review under the City of Newport planning and zoning ordinances, the South Beach Urban Renewal Plan and Report (and recent amendments), the Lincoln County Comprehensive Plan, the Yaquina Bay Estuary Management Plan, the Oregon Removal-Fill Law, the Oregon Beach Bill, and other applicable state and federal regulations mentioned within the EA.

The existing environment associated with the proposed action at this Site Alternative is described for each resource topic and environmental condition within the various sections of this EA (refer to various other parts of Section 5, in relation to Site Alternative 4).

5.11.6.2 Environmental Consequences

City of Newport ordinances and planning documents (Lincoln County, 2009) were evaluated, primarily within Section 5.1.5 of this EA. The proposed action would be consistent with these local planning requirements and guidelines.

Chapter 1, Land Use Planning, within the Lincoln County Comprehensive Plan (Sites Southwest LLC, 2007) presents the overall policies associated with future growth and development in the County. This policy reflects a consideration of the County's problems and needs as well as its social, environmental and economic values. The Plan consists of four primary elements: The Comprehensive Plan Inventory; the Comprehensive Plan Policies; the Comprehensive Plan Maps; and the Lincoln County Transportation System Plan. The Comprehensive Plan Inventory provides the background information, data and other factual base material concerning the social, economic and environmental resources of the County. The Comprehensive Plan Policies are the formal binding policy statements which direct future growth and development and which are derived from the problems and needs identified in the Comprehensive Plan Inventory. The Comprehensive Plan Maps assign land use designations to all areas of the County in accordance with the requirements of the Comprehensive Plan Policies. These three elements were considered together to analyze whether the proposed action under Site Alternative 4 would be consistent with the County Comprehensive Plan.

The proposed action under Site Alternative 4 was evaluated relative to the Lincoln County Comprehensive Plan elements and the South Beach Urban Renewal Plan and Report, and its amendments (City of Newport, 1983; 2009b). The topics considered include those analyzed here and in other sections of the EA, including estuary resource policies, economic and transportation goals, management and planning within natural resource areas, among others. Based on the anticipated impacts and recommended mitigation measures identified, implementation of the proposed action at Site Alternative 4 would be consistent with the Lincoln County Comprehensive Plan and the South Beach Urban Renewal Plan and Report.

The proposed action at Site Alternative 4 is within a Development Management Unit designated for navigation and other identified needs for public, commercial and industrial, water dependent uses, consistent with the level of development or alteration allowed by the Oregon Estuary Classification (City of Newport, 1991). As such, the proposed action is consistent with the overall Oregon Estuary Classification pertaining to the installation of water-dependent uses requiring an estuarine location, and water-related uses which do not degrade or reduce natural

estuarine resources and value. Relative to anticipated pile removal, installation and berth dredging outside of the adjacent Yaquina Bay ship channel, a Dredged Material Disposal Site Overlay Zone map for Lincoln County was consulted. No dredged material disposal sites would be altered due to incompatible development prior to their usefulness as disposal sites for dredged spoils. No conflict with estuary resources with the Lincoln County Estuary Management Plan (Lincoln County, 1982) would result from implementation of the proposed action at Site Alternative 4.

The proposed project under Site Alternative 4 was evaluated relative to general requires under Oregon Removal Fill Law (ORS 196.800 through 196.990). The Oregon Division of State Lands, the DLCD and the USACE have designed a streamlined process for reviewing permit applications for fill and removal permits. Their joint permit form is submitted after the local county planning department has reviewed and signed it. Once accepted, the application is jointly reviewed and the agencies take steps to notify adjoining landowners, stakeholders, and concerned parties of the application. It is anticipated that the proposed action, when more fully defined, would be eligible for approval, with conditions, under this permit process.

The proposed action within Yaquina Bay would adhere to the Oregon Removal Fill Law (ORS 196.800 through 196.990), Section 10 of the Rivers and Harbors Act of 1899, and other applicable state and federal laws.

Based on the analysis within each section of this EA, the proposed federal action at Site Alternative 4 is expected to be consistent to the maximum extent practicable to the OCMP.

5.11.6.3 Mitigation

The following mitigation measures in relation to coastal zone management are recommended for the proposed action at Site Alternative 4:

- The Oregon State coastal program's federal consistency coordinator should be consulted regarding review under the OCMP application process.

Mitigation measures appropriate for the proposed action at this Site Alternative in relation to other resource topics or environmental conditions are summarized in Section 7 of this EA.

It is expected that the lessor will satisfy appropriate mitigation measures by following the usual permitting and regulatory requirements.

5.12 AGRICULTURAL RESOURCES

The Farmland Protection Policy Act (FPPA) sets forth federal policies to prevent the unnecessary and irreversible conversion of farmland to nonagricultural uses. For the purpose of

FPPA, farmland includes prime farmland, unique farmland, and land of statewide or local importance. Regulations at 7 CFR 658.2(a) exclude land from definition of farmland as those lands already in urban use or committed to urban development or water storage (USDA, 2009b).

Given the proposed action's coastal location, the effects of the proposed action on water-based agriculture (aquaculture) are also of concern.

5.12.1 No-Action Alternative

5.12.1.1 Existing Environment

The No-Action Alternative assumes continuation of upland activities at the existing MOC-P site on Lake Union, and continuation of water-based activities (ship berthing, etc) at various temporary locations around Lake Union and the Seattle area, as described in Section 4.3 above. The existing environment of the Lake Union area in relation to agricultural resources is described more fully in Section 5.12.2.1 below.

5.12.1.2 Environmental Consequences

There are no agricultural or aquaculture activities in proximity to the existing MOC-P, and no changes to existing conditions are proposed under the No-Action Alternative. Therefore there would be no impact on agricultural or aquaculture resources.

5.12.1.3 Mitigation Measures

No mitigation measures with respect to agricultural or aquaculture resources are recommended under the No-Action Alternative.

5.12.2 Site Alternative 1: Lake Union

5.12.2.1 Existing Environment

The site is located in an urbanized area within the city of Seattle, Washington. There are no agricultural activities on or surrounding the site. No FPPA resources, including prime or unique farmland, or farmland of statewide importance are present on or within areas potentially affected under Site Alternative 1.

The site is located on the shore of Lake Union, which contains no aquaculture resources.

5.12.2.2 Environmental Consequences

There are no agricultural or aquaculture activities in proximity to the site. The proposed action at Site Alternative 1 would have no impact on agricultural or aquaculture resources.

5.12.2.3 Mitigation Measures

No mitigation measures with respect to agricultural or aquaculture resources are recommended for the proposed action at Site Alternative 1.

5.12.3 Site Alternative 2: Port Angeles

5.12.3.1 Existing Environment

The site is located within an urbanized area within the city of Port Angeles. There are no agricultural resources on the site or in areas surrounding the site. No FPPA resources, including prime or unique farmland, or farmland of statewide importance are present on or within areas potentially affected under Site Alternative 2.

The nearest commercial shellfish farm is at Sequim Bay, approximately twenty miles east of the site.

5.12.3.2 Environmental Consequences

There are no agricultural or aquaculture activities in proximity to the site. The proposed action at Site Alternative 2 would have no impact on agricultural or aquaculture resources.

5.12.3.3 Mitigation Measures

No mitigation measures with respect to agricultural or aquaculture resources are recommended for the proposed action at Site Alternative 2.

5.12.4 Site Alternative 3: Bellingham

5.12.4.1 Existing Environment

The site is located in an urbanized area within the city of Bellingham. There are no agricultural resources on or surrounding the site. No FPPA resources, including prime or unique farmland, or farmland of statewide importance are present on or within areas potentially affected under Site Alternative 3.

The only commercial shellfish harvesting area in Bellingham Bay is the Portage Island area, more than five miles southwest of the site.

The Whatcom Creek Hatchery is located at the Maritime Heritage Center in Bellingham, at the mouth of Whatcom Creek, approximately 3,000 feet northeast of the site. The hatchery works to enhance local salmon runs and is operated by students in the Fisheries Technology program at Bellingham Technical College. The facility has the capacity to raise around six million fish annually (NWFSC, 2005).

5.12.4.2 Environmental Consequences

The site is located within an existing urban area, therefore the proposed action at this Site Alternative would have no impact on farmland or other land-based agricultural resources.

The proposed action at this Site Alternative is unlikely to adversely impact the Whatcom Creek Hatchery, as the Whatcom Waterway has historically been used as a shipping channel, therefore any additional vessel movements and associated wakes would be a negligible increase compared with the historical situation. The proposed action, once constructed would not adversely affect water quality, but may have short-term impacts on water quality during construction (refer Section 5.4.4.2). However, due to the distance of the nearest aquaculture resources to the site, the effects of the proposed action at Site Alternative 3 on aquaculture resources are considered to be negligible.

5.12.4.3 Mitigation Measures

No mitigation measures with respect to agricultural or aquaculture resources are recommended for the proposed action at Site Alternative 3.

5.12.5 Site Alternative 4: Newport

5.12.5.1 Existing Environment

The site is located within the urban boundary of the city of Newport. There are no agricultural resources on or surrounding the site, however a maraschino cherry processing operation currently on the site could be considered agriculture-related activities. No FPPA resources, including prime or unique farmland, or farmland of statewide importance are present on or within the vicinity of the site.

The nearest commercial shellfish farm is the Oregon Oyster Farms, Inc., located near Oysterville, approximately four miles from the site, upstream in Yaquina Bay. The Hatfield Marine Science Center, adjacent to the site, operates a Molluscan Broodstock Program, whereby oysters are raised in seawater tanks (via a filtered seawater intake) until the spat stage, when they are “planted out” at various sites along the west coast of the U.S., in order to conduct research. Within Yaquina Bay, the broodstock program has oysters attached to the OSU dock (immediately adjacent to the site), as well as approximately four miles upstream at the Oregon Oyster Farms site (Langdon, 2009).

5.12.5.2 Environmental Consequences

The site is located within an existing semi-urbanized area, therefore the proposed action at this Site Alternative would have no impact on farmland or other land-based agricultural resources.

The existing maraschino cherry processing operation on site is not associated with soil or other resources at the site. Relocation of this operation under the proposed action at this alternative would not affect agricultural resources.

Due to the adjacency of the OSU dock to the site, the potential exists for minor, short-term impacts to the Hatfield Marine Science Center's Molluscan Broodstock Program during the construction period for in-water work (i.e., removal and installation of piles). However, the Program uses filtered Bay water to cultivate its broodstock; hence, with advance notification of the schedule for proposed in-water activities, scheduled "plant outs" of shellfish at the OSU dock could be coordinated or effects monitored; and necessary changes in the frequency of water filter monitoring and replacement during this period could be undertaken by the Program.

The proposed action, once constructed would not adversely affect water quality in the long-term, but may have minor short-term effects on local water quality (and adjacent broodstock propagation) during construction (refer Section 5.4.5.2).

5.12.5.3 Mitigation Measures

The following mitigation measures with respect to agricultural or aquaculture resources are recommended for the proposed action at Site Alternative 4:

- Advance notification of the schedule for proposed in-water activities should be provided to the Hatfield Marine Science Center's Molluscan Broodstock Program, so that necessary changes, such as the frequency of water filter monitoring and replacement, could be undertaken by the Program during this period.

5.13 NOISE

State and federal standards state that a noise level of 66 A-weighted decibels (dBA) is considered to approach the noise abatement criteria (67 dBA); while a noise level greater than or equal to 67 dBA is considered to exceed the noise abatement criteria (23 CFR 772). A 10 dBA increase over existing noise levels is considered to be a substantial increase.

In Washington State, the WDOE regulates the level of noise that one property owner can cause to intrude into the property of another owner (WAC 173-60). This sound level is called the maximum permissible environmental noise level, and depends on the land uses of the noise source property and the receiving property. When the noise source property is zoned industrial, the maximum permissible environmental noise level at residential, commercial and industrial properties is 60 dBA, 65 dBA and 70 dBA, respectively. Construction noise is exempt from this regulation between the hours of 7:00 a.m. and 10:00 p.m. Sounds created by warning devices not operating continuously for more than five minutes are exempt at all times.

In Oregon State, the ODEQ regulates noise emanating from industrial operations when they are received at noise sensitive properties (i.e., properties used for sleeping, schools, churches, hospitals and libraries). At a noise sensitive property, the allowable noise levels for the loudest 50, 10 and 1 percent of a given hour are 55 dBA, 60 dBA and 75 dBA, respectively (OAR 340-35-035). Between the hours of 10:00 p.m. and 7:00 a.m., these levels are reduced by 5 dBA. Construction noise and sounds created by warning devices not operating continuously for more than five minutes are exempt at all times.

5.13.1 No-Action Alternative

5.13.1.1 Existing Environment

The No-Action Alternative assumes continuation of upland activities at the existing MOC-P site on Lake Union, and continuation of water-based activities (ship berthing, etc) at various temporary locations around Lake Union and the Seattle area, as described in Section 4.3 above. The existing environment of the Lake Union area in relation to noise is described more fully in Section 5.13.2.1 below.

5.13.1.2 Environmental Consequences

Under the No-Action Alternative, the existing MOC-P at Lake Union would continue to support administrative functions only. No new noise sources would be established and existing ambient noise would remain unchanged. No noise impacts would result.

5.13.1.3 Mitigation Measures

No mitigation measures are recommended in relation to noise for the No-Action Alternative.

5.13.2 Site Alternative 1: Lake Union

5.13.2.1 Existing Environment

The City of Seattle has adopted the WDOE maximum permissible environmental noise levels (SMC 25.08.410). Construction noise is not exempt. However, the maximum permissible environmental noise levels can be exceeded by an additional 25 dBA for equipment on construction sites between the hours of 7:00 a.m. and 10:00 p.m. (SMC 25.08.425). Sounds created by warning devices or alarms are exempt at all times, so long as they are not operated continuously for more than 30 minutes per incident (SMC 25.08.530).

MOC-P is currently supporting administrative and warehouse functions at Lake Union. Its remaining shops, boat house, marine piers and in-water infrastructure are not operational due to fire damage sustained in July 2006. The adjacent properties to the south are developed for

industrial use. Land uses on the properties across Fairview Avenue East are typically commercial and industrial. Sensitive noise receptors in the vicinity of the proposed site include residential house boats, located approximately 200 feet north of the northern tip of the existing piers.

Contributors to the ambient noise at the proposed site include automobiles (on site and on adjacent streets), birds, construction on the east side of Fairview Avenue East, and shipyard activities on the adjacent property to the south. The following ambient noise levels were measured at the site on March 2, 2009:

Date	Location	L_{eq}	L_{max}	L_{min}
March 2, 2009	Seattle	46 – 62 dBA	58 – 75 dBA	43 – 58 dBA

dBA = A-weighted decibel
L_{eq} = the constant sound level which has the same energy as the actual varying, measured sound level
L_{max} = The highest A-weighted sound level occurring during a noise event
L_{min} = The lowest A-weighted sound level occurring during a noise event

5.13.2.2 Environmental Consequences

The current ambient noise levels at the proposed site are typical for an industrial site. Under current conditions, ambient noise would not negatively impact individuals on-site. The ambient noise levels would increase under this alternative due to the operational noise of the NOAA vessels, as well as the support vehicles and equipment being operated on the vessels and throughout the property. Sound levels generated by industrial operations that exceed 85 dBA would require personal protective equipment for workers in proximity to these operations (WAC 296-817).

However, the increased noise levels would not adversely impact individuals within the proposed buildings. In accordance with the SFO, the building enclosures would be designed and constructed to achieve a sound transmission coefficient (STC) of at least 50 decibels. This would mitigate the negative impacts to individuals within the proposed buildings. Therefore, this impact would not be significant.

Noise would be generated by operating vehicles and equipment during demolition, site redevelopment, and new building construction under Site Alternative 1. Construction noise fluctuates depending on site activities, and can range from 75 to 100 dBA at close range.

Due to their proximity to the northern tip of the property, anticipated noise levels at the residential house boats caused by 75 to 100 dBA construction activities would be approximately 55 to 80 dBA for these receptors. These levels are below the City of Seattle construction noise limits (i.e., 85 dBA, 90 dBA and 95 dBA at residential, commercial and industrial properties, respectively. In addition, construction activities would be short-term and restricted to weekdays

during daytime hours. Construction noise would not be significant at these sensitive noise receptors during evening and nighttime hours, when quiet is of most importance to residents.

Following construction, NOAA operations and maintenance on site would generate noise. The majority of NOAA personnel would drive personal vehicles to work. These vehicles would presumably be equipped with functional exhaust mufflers and be operated on site for short periods of time, i.e., just enough time to get in and out of the parking lot. Maintenance activities (e.g., grinding, equipment testing) would typically be conducted inside the warehouse. As previously discussed, the STC of the proposed buildings would prevent substantial noise transmission through the exterior walls of the buildings. NOAA personnel may occasionally use forklifts to load and unload materials from the vessels berthed at the site. Engine/transmission noise and back-up alarms can exceed 85 dBA. However, forklift use on site would be infrequent and restricted to weekdays during daytime hours. Noise impacts due to upland site operations would not be significant.

MOC-P operations at the site would require occasional, temporary use of a diesel generator for backup power. The generator would be installed, maintained and operated in accordance with manufacturer specifications. The generator also would be equipped with an exhaust muffler and be located within an enclosure, further attenuating noise levels. Noise impacts to adjacent properties caused by occasional testing and maintenance of the emergency generator are exempt from state and local regulations and would not be significant.

Large-scale repair operations would not be performed on the NOAA ships berthed at the MOC-P pier; these operations would be conducted at off-site locations. Routine maintenance would be performed on the NOAA vessels when they are berthed at the MOC-P pier. Noise-producing, routine maintenance activities would include pressure washing, grinding of metal, painting, and sandblasting. These operations would be conducted infrequently at isolated locations of each ship. Typical noise levels for these routine operations can exceed 85 dBA; sandblasting can produce noise levels exceeding 100 dBA at close range.

Previous noise assessments have been undertaken at a port facility where workers were pressure washing and performing isolated repairs on a barge berthed at a pier. At a distance of 150 feet, these operations produced a sound level of 55 dBA. According to NOAA personnel, routine maintenance operations could be conducted on the six ships that are likely be berthed at the MOC-P pier, as discussed in Section 3 of this EA.

The residential property nearest to the proposed NOAA berths is approximately 200 feet from the north end of the pier. Assuming that all six ships were berthed along the proposed pier and that all were simultaneously undergoing routine maintenance similar to that being conducted on the barge, the cumulative noise level at that property line would be approximately 56 dBA. This

is below the 60 dBA maximum permissible environmental noise level allowed by WDOE and the City of Seattle at residential properties. If we assume that sandblasting operations producing 100 dBA were being conducted on all six ships simultaneously, the cumulative noise level at that property line would be approximately 72 dBA. However, this is a worst-case scenario that is unlikely to occur. Actual noise impacts to adjacent properties during routine maintenance operations on the NOAA ships would most likely be lower. In addition, maintenance activities on the ships would be short-term and restricted to weekdays during daytime hours. Operational noise would not be significant at these sensitive noise receptors during evening and nighttime hours, when quiet is of most importance to residents.

5.13.2.3 Mitigation Measures

Based on the above assessment of noise-producing activities at Site Alternative 1, no mitigation measures are recommended.

5.13.3 Site Alternative 2: Port Angeles

5.13.3.1 Existing Environment

The City of Port Angeles has adopted the WDOE noise regulations (Port Angeles Municipal Code 15.16). This includes the maximum permissible environmental noise levels, construction noise exemptions and warning device exemptions previously described.

Site Alternative 2 in Port Angeles is currently developed for use as a maritime industrial site. The adjacent properties are also developed for industrial use. Land uses in the area are typically commercial and industrial. Sensitive noise receptors in the vicinity of the proposed site include the residential neighborhoods located approximately 1,000 feet southwest of the site.

Contributors to the ambient noise at the proposed site include automobiles (on site and on adjacent streets), birds, and operations at the Westport Shipyard adjacent to the eastern property boundary. At the time of this assessment, industrial operations on site and at nearby properties were minimal. The following ambient noise levels were measured at the site on March 3, 2009:

Date	Location	L_{eq}	L_{max}	L_{min}
March 3, 2009	Port Angeles	47 – 55 dBA	67 – 70 dBA	36 – 39 dBA

dBA = A-weighted decibel
L_{eq} = the constant sound level which has the same energy as the actual varying, measured sound level
L_{max} = The highest A-weighted sound level occurring during a noise event
L_{min} = The lowest A-weighted sound level occurring during a noise event

5.13.3.2 Environmental Consequences

The current ambient noise levels at the proposed site are below typical noise levels for an industrial site. Under current conditions, ambient noise would not negatively impact individuals

at this location. The ambient noise levels at the site would increase under this alternative due to the operational noise of the NOAA ships, as well as the support vehicles and equipment being operated throughout the property. Sound levels generated by industrial operations can exceed 85 dBA and require personal protective equipment for workers in proximity to these operations (WAC 296-817).

However, the increased noise levels would not adversely impact individuals inside the proposed buildings. In accordance with the SFO, the building enclosures would be designed and constructed to achieve an STC of at least 50 decibels. This would mitigate the negative impacts to staff when working inside the building. Therefore, this impact would not be significant.

Noise would be generated by operating vehicles and equipment during demolition, site redevelopment, and new building construction at the proposed MOC-P site. Construction noise fluctuates depending on site activities, and can range from 75 to 100 dBA at close range.

Due to their distance from the proposed MOC-P site, anticipated noise levels at the residential neighborhoods southwest of the site caused by 75 to 100 dBA construction activities would be approximately 35 to 60 dBA. However, construction activities would be short-term and restricted to weekdays during daytime hours. Construction noise would have an impact to adjacent areas only and would not be significant at sensitive noise receptors.

NOAA operations resulting in noise would be similar to that described in Section 5.13.2.2. The nearest property line to the future locations of the ships at the proposed MOC-P site is approximately 400 feet from the east end of the pier. If we assume that all six ships were berthed along the proposed pier and that all were simultaneously undergoing routine maintenance similar to that for which previous noise assessments have been undertaken, the cumulative noise level at that property line would be approximately 53 dBA. This is below the 70 dBA maximum permissible environmental noise level allowed by WDOE and the City of Port Angeles at industrial properties. If we assume that sandblasting operations producing 100 dBA were being conducted on all six ships simultaneously, the cumulative noise level at that property line would be approximately 68 dBA. This is also below the 70 dBA maximum permissible environmental noise level. In addition, this is a worst-case scenario that is unlikely to occur. Actual noise impacts to adjacent properties during routine maintenance operations on the NOAA ships would most likely be lower. Therefore, operational noise impacts from the NOAA ships berthed at the proposed MOC-P pier would not be significant.

5.13.3.3 Mitigation Measures

Based on the above assessment of noise-producing activities at Site Alternative 2, no mitigation measures are recommended.

5.13.4 Site Alternative 3: Bellingham

5.13.4.1 Existing Environment

The City of Bellingham has adopted the Ecology maximum permissible environmental noise levels (Bellingham Municipal Code 20.16.020). Construction noise is exempt between the hours of 7:00 a.m. and 10:00 p.m. However, construction noise between the hours of 10:00 p.m. and 7:00 a.m. is considered public disturbance noise and is strictly prohibited (Bellingham Municipal Code 10.24.120).

The NOAA MOC-P Site Alternative in Bellingham is currently developed for use as a maritime industrial site. The adjacent properties also are developed for industrial use. Land uses in the area are typically commercial and industrial. Sensitive noise receptors in the vicinity of the proposed site include the educational facilities of Western Washington University, located approximately 2,000 feet southeast of the site.

Contributors to the ambient noise at the proposed site include automobiles (on site and on adjacent streets), birds, ships docked at the existing pier and trains operating on the rail line that runs across the western portion of the site. At the time of this assessment, industrial operations on site and at nearby properties were minimal. A cargo ship and barge were docked at the existing pier. No onboard operations that might generate noise were noted on the cargo ship. Maintenance operations (e.g., grinding, painting, pressure washing) were being conducted on the barge. The following ambient noise levels were measured at the site on March 6, 2009:

Date	Location	L_{eq}	L_{max}	L_{min}
March 6, 2009	Bellingham	38 – 47 dBA	58 – 69 dBA	29 – 32 dBA

dBA = A-weighted decibel
L_{eq} = the constant sound level which has the same energy as the actual varying, measured sound level
L_{max} = The highest A-weighted sound level occurring during a noise event
L_{min} = The lowest A-weighted sound level occurring during a noise event

5.13.4.2 Environmental Consequences

The current ambient noise levels at the proposed site are below typical noise levels for an industrial site. Under current conditions, ambient noise would not negatively impact the NOAA staff who might work at this location. The ambient noise levels at the site would increase under this alternative due to the operational noise of the NOAA ships, as well as the support vehicles and equipment being operated throughout the property. Sound levels generated by industrial operations can exceed 85 dBA and require personal protective equipment for workers in proximity to these operations (WAC 296-817).

However, the increased noise levels would not adversely impact NOAA staff working inside the proposed buildings. In accordance with the SFO, the building enclosures would be designed and

constructed to achieve an STC of at least 50 decibels. This would mitigate the negative impacts to staff when working inside the building. This impact would not be significant.

Noise would be generated by operating vehicles and equipment during demolition, site redevelopment, and new building construction at the proposed MOC-P site. Construction noise fluctuates depending upon site activities, and can range from 75 to 100 dBA at close range.

Due to its distance from the proposed MOC-P site, anticipated noise levels at the Western Washington University Campus caused by 75 to 100 dBA construction activities would be approximately 29 to 54 dBA. Construction activities would be short-term and restricted to weekdays during daytime hours. Construction noise would have an impact to adjacent areas only and would not be significant at sensitive noise receptors.

NOAA operations resulting in noise would be similar to that described in Section 5.13.2.2. The nearest property line to the future locations of the ships at the proposed MOC-P site is approximately 300 feet from the east end of the pier. If we assume that all seven ships were berthed along the proposed pier and that all were simultaneously undergoing routine maintenance similar to that for which previous noise assessments have been undertaken, the cumulative noise level at that property line would be approximately 54 dBA. This is below the 70 dBA maximum permissible environmental noise level allowed by WDOE and the City of Bellingham at industrial properties. If we assume that sandblasting operations producing 100 dBA were being conducted on all seven ships simultaneously, the cumulative noise level at that property line would be approximately 69 dBA. This is also below the 70 dBA maximum permissible environmental noise level. In addition, this is a worst-case scenario that is unlikely to occur. Actual noise impacts to adjacent properties during routine maintenance operations on the NOAA ships would most likely be lower. Therefore, operational noise impacts from the NOAA ships docked at the MOC-P pier would not be significant.

5.13.4.3 Mitigation Measures

Based on the above assessment of noise-producing activities at Site Alternative 3, no mitigation measures are recommended.

5.13.5 Site Alternative 4: Newport

5.13.5.1 Existing Environment

The City of Newport has adopted the ODEQ allowable noise limits for noise sensitive properties (Newport Municipal Code 8.15.015). The maximum noise limit that can be received by properties that are not noise sensitive is 60 dBA between 10:00 p.m. and 7:00 a.m., and 75 dBA at any other time. Construction noise is exempt from this regulation between the hours of 7:00

a.m. and 10:00 p.m. Sounds created by warning devices not operating continuously for more than 15 minutes and sounds made by or ancillary to ordinary operation of boats and other watercraft are exempt at all times.

The NOAA MOC-P Site Alternative in Newport is currently developed for use as a industrial site. The adjacent properties to the south and west also are zoned for industrial use and are currently used to store dredge materials and a fruit processing operation. The adjacent property to the east is owned by OSU and developed as the Hatfield Marine Science Center. A marina is located approximately 1,000 feet southwest and additional marinas and hotel properties are located 2,000 feet northeast across Yaquina Bay. A recreational vehicle (RV) park is located approximately 800 feet south of the site. Sensitive noise receptors in the vicinity of the proposed site include the educational and residential facilities at the Hatfield Marine Science Center, the hotel rooms across the bay, and the RV Park.

Contributors to the ambient noise at the proposed site include automobiles (on site and on adjacent streets), birds, and forklifts and fruit processing machinery operating on the adjacent property to the south, and research vessels berthed at the OSU dock to the east. No vessels were docked at the existing pier during this assessment. The following ambient noise levels were measured at the site on March 19, 2009:

Date	Location	L_{eq}	L_{max}	L_{min}
March 19, 2009	Newport	59 – 66 dBA	77 – 82 dBA	54 – 57 dBA

dBA = A-weighted decibel
L_{eq} = the constant sound level which has the same energy as the actual varying, measured sound level
L_{max} = The highest A-weighted sound level occurring during a noise event
L_{min} = The lowest A-weighted sound level occurring during a noise event

5.13.5.2 Environmental Consequences

The current ambient noise levels at the proposed site are typical for an industrial site. Under current conditions, ambient noise would not negatively impact the NOAA staff who might work at this location. The ambient noise levels at the site would increase under this alternative due to the operational noise of the NOAA ships, as well as the support vehicles and equipment being operated throughout the property. Sound levels generated by industrial operations can exceed 85 dBA and require personal protective equipment for workers in proximity to these operations (OAR 437-002-1910.95).

However, the increased noise levels would not adversely impact NOAA staff working inside the proposed buildings. In accordance with the SFO, the building enclosures would be designed and constructed to achieve an STC of at least 50 decibels. This would mitigate the negative impacts to staff when working inside the building. This impact would not be significant.

Noise would be generated by operating vehicles and equipment during demolition, site redevelopment, and new building construction at the proposed MOC-P site. Construction noise fluctuates depending upon site activities, and can range from 75 to 100 dBA at close range.

Due to their distance from the proposed MOC-P site, anticipated noise levels at the nearest buildings on the Hatfield Marine Science Center caused by 75 to 100 dBA construction activities would be approximately 37 to 62 dBA. Anticipated construction noise levels received at the hotel properties across Yaquina Bay would be 29 to 54 dBA. However, construction activities would be short-term and restricted to weekdays during daytime hours. Construction noise would impact adjacent areas only and would not be significant at sensitive noise receptors.

NOAA operations resulting in noise would be similar to that described in Section 5.13.2.2. The nearest property line to the future locations of the ships at the proposed MOC-P site is approximately 400 feet from the east end of the pier. If we assume that all seven ships were berthed along the proposed pier and that all were simultaneously undergoing routine maintenance similar to that being conducted on the barge, the cumulative noise level at that property line would be approximately 52 dBA. This level is below the ODEQ 55 dBA allowable noise level for the loudest 50 percent of a given hour. In addition, the noise generated by routine maintenance would be exempt from the City of Newport noise regulations, as it is ancillary to ordinary operation of watercraft. If we assume that sandblasting operations producing 100 dBA were being conducted on all seven ships simultaneously, the cumulative noise level at that property line would be approximately 67 dBA. However, this is a worst-case scenario that is unlikely to occur. Actual noise impacts to adjacent properties during routine maintenance operations on the NOAA ships would most likely be lower. Therefore, operational noise impacts from the NOAA ships docked at the MOC-P pier would not be significant.

5.13.5.3 Mitigation Measures

Based on the above assessment of noise-producing activities at Site Alternative 4, no mitigation measures are recommended.

5.14 TRANSPORTATION

This traffic impact analysis assesses the effects of the proposed action on the transportation network in the community. A qualitative analysis is used to assess whether the proposed action has the potential to result in a significant impact, and whether a quantitative analysis and prospective improvements to transportation infrastructure may be necessary. The approach applied involves the use of trip generation data, essentially the number of inbound and outbound vehicle trips expected to be generated due to the proposed action during an average day or during

peak hour traffic. The expected trip generation is compared to accepted thresholds to determine whether a more comprehensive traffic analysis is needed.

The trip generation process applied provides an estimate of the number of trips that would be generated under worst-case conditions. Trip generation rates are then compared to the proposed land uses. Generally, a quantitative traffic analysis should be completed whenever a development is expected to exceed 55,000 square feet of general office space or 115,000 square feet of light industrial space, or exceed an established Community Threshold Level (Edwards, 2000). The proposed action is well below these development guidelines for each site alternative. However, an analysis of existing peak-hour traffic counts in the vicinity of each site alternative would result in a more accurate identification of project impacts.

Level of Service (LOS) is another qualitative measurement used to describe traffic conditions of a transportation route. It is based on the number of vehicles using the roadway compared to the maximum number of vehicles the route/intersection was designed to accommodate. LOS is expressed qualitatively using letters from 'A' through 'F'. LOS A represents free flow conditions, while F represents gridlock (Transportation Research Board, 2000). Within the states of Washington and Oregon, LOS C or better is considered an acceptable level for state highways/intersections in rural areas; and LOS D or better is considered an acceptable level for state highways/intersections in urban areas. The counties/municipalities within these states have also adopted the same LOS levels as an acceptable standard.

This EA presents a qualitative analysis of the anticipated traffic impacts for the proposed action on the LOS level of surrounding roads and intersections at each site alternative. Due to a lack of available traffic count data and LOS data at affected road segments and intersections for each of the sites, a quantitative analysis would be recommended only if the project has the potential to result in a significant impact.

5.14.1 No-Action Alternative

5.14.1.1 Existing Environment

The No-Action Alternative assumes continuation of upland activities at the existing MOC-P site on Lake Union, and continuation of water-based activities (ship berthing, etc.) at various temporary locations around Lake Union and the Seattle area, as described in Section 4.3 above. The existing transportation environment of the Lake Union area is described more fully in Section 5.14.2.1 below.

5.14.1.2 Environmental Consequences

There would be no change to the existing site conditions and traffic generation under the No-Action Alternative. Therefore, the No-Action Alternative would have no impacts on transportation resources.

5.14.1.3 Mitigation Measures

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

5.14.2 Site Alternative 1: Lake Union

5.14.2.1 Existing Environment

The site is located within the city limits of Seattle, Washington. The proposed site is accessed via Fairview Avenue East, between East Blaine Street and East Newton Street. Each of these three streets are two-lane undivided roadways (one lane in each direction).

Interstate 5 (I-5) is located approximately 1,000 feet east of the site. Northbound traffic on the I-5 would most likely access the site via exit 168 at Mercer Street, and travel north along Fairview Avenue North, then Fairview Avenue East. Southbound traffic on the I-5 would most likely access the site via exit 168A at Boyleston Avenue East, and travel south along Boyleston, then East Newton Street to Fairview Avenue East. There are several likely routes for local traffic using surface streets to access Fairview Avenue East and the site.

Public transportation in the site vicinity is provided by King County Metro Transit. The nearest bus stop is located on Eastlake Avenue, approximately 1,000 feet from the site. Bus services along this route operate six days a week, approximately every 15 minutes on weekdays, between the University District and downtown Seattle (King County Metro Transit, 2009).

The site contains the existing MOC-P homeport facility, which is currently only conducting land-side administrative and warehousing/laboratory activities. At present, approximately 45 NOAA staff work at the site each day.

5.14.2.2 Environmental Consequences

Under the proposed action at Site Alternative 1, the following changes in traffic generation are anticipated at the site:

- The maximum number of on-site NOAA staff, such as officers, engineers and administrative personnel would be 70, allowing for absences due to vacation, illness or business travel. However, approximately 45 individuals are presently working at the

existing MOC-P at this site, therefore only 25 additional staff members are associated with the proposed action at this location.

- Up to a maximum of 115 Mariner Crew for all NOAA vessels would occur during periodic arrivals and departures on-site. While these are typically distributed among 10 to 20 crew for each vessel and occur randomly from April through October, a worst-case would be all 115 crew each with total of 2 round trips. It is assumed that one third of these trips would use public transportation or carpool.

- Periodic on-site contractors and infrequent visitors would typically consist of 10 individuals resulting in 40 total trips per year for ship repair and other business, and 8 permanent on-site contractors each arriving and departing during non-peak weekday hours.

- Periodic arrival/departure of researchers taking working cruises on NOAA vessels would occur. Overall, approximately 70 researchers each with 2 round trips per year would occur, primarily from March to October. It is assumed that about one third of these would use shuttle/carpool from a common distant origin (i.e., WRC in Seattle, NOAA Fisheries laboratories, national marine sanctuary offices).

- Deliveries:

  – Deliveries from large trucks (semis, tractor-trailer units etc.) occur mainly during winter, with a maximum of ten per month. Much less frequent trips occur during the cruise season from March through October (about 1-3 per month).

  – Deliveries from smaller trucks (e.g., UPS and Federal Express) occur every day. Other five-ton delivery trucks visit the site daily. These traffic movements are existing, and are unlikely to increase significantly under the proposed action.

  – Service trucks would enter and leave a maximum of once per day to unload waste oil, solid waste, bilge water with oily waste, etc. from ships during November through March only.

Based on the above information, and information from existing uses, the additional trip generation for the proposed action at Site Alternative 1 is summarized in **Table 5.14-1** below.

Table 5.14-1: Trip Generation

		Daily Trips		A.M. Peak Hour					P.M. Peak Hour				
Staff	**Frequency**	**Rate**	**Total**	**Rate**	**In:Out**	**In**	**Out**	**Total**	**Rate**	**In:Out**	**In**	**Out**	**Total**
NOAA Staff	25 / day	2	50	1.0	95:05	47	3	50	1.0	95:05	47	3	50
Vessel Crew	115 /year (Apr-Oct)	1.4	161	0.7	95:05	107	6	113	0.7	95:05	75	4	79
Contractors	18 / year	2	36	1.0	95:05	34	2	36	1.0	95:05	34	2	36
Researchers	70 / year	1.4	98	0.7	95:05	65	3	69	0.7	95:05	46	2	48
Deliveries	10 / month		20	0.5	95:05	10	1	10	0.2	95:05	2	0	2
Total			**365**			**263**	**15**	**278**			**204**	**11**	**215**

Based on the projected use and data provided, it is projected that the proposed action at Site Alternative 1 would generate approximately 365 daily trips, with approximately 263 trips occurring during the a.m. peak hour and approximately 215 trips occurring during the p.m. peak hour.

The trip generation summarized above represents a worst-case scenario. The trip generation assumes that all of the trips would occur on the same day, even though the possibility of such an occurrence is minimal.

Based on the projected trips from the proposed action at Site Alternative 1, the limited size of the proposed land use, and the transportation infrastructure within the immediate vicinity of the site, the proposed action is not expected to result in a significant impact to vehicle traffic.

5.14.2.3 Mitigation Measures

No mitigation measures are recommended in relation to transportation for Site Alternative 1.

5.14.3 Site Alternative 2: Port Angeles

5.14.3.1 Existing Environment

The site is located within the city limits of Port Angeles, Washington. The proposed site would be accessed via Marine Drive or Tumwater Street, both of which are two-lane undivided roadways (one lane in each direction).

Traffic from downtown/central Port Angeles or further east (e.g., Seattle) would most likely access the site via US 101, along Front Street then Marine Drive. Traffic accessing the site from the William R. Fairchild International Airport or further west would most likely access the site via State Route 117 (Tumwater Truck Route) then Marine Drive. Local traffic from the northwest or southern areas of Port Angeles would likely access the site via Tumwater Street.

Public transportation in the site vicinity is provided by Clallam Transit. The Port Angeles Transit Center (hub for all bus routes) is located approximately 3,000 feet east of the site. The nearest bus route passes along Marine Drive and Tumwater Streets, immediately adjacent to the site. Bus services along this route operate six days per week, and run approximately every 30-60 minutes on weekdays, linking the airport and western areas of Port Angeles with the downtown and Transit Center (Clallam Transit, 2009).

The majority of the site is currently vacant, (except for the maintenance shop/warehouse building), and is used for temporary vehicle parking and boat storage.

5.14.3.2 Environmental Consequences

Under the proposed action at Site Alternative 2, the following changes in traffic generation are anticipated at the site:

- The maximum number of on-site NOAA staff, such as officers, engineers and administrative personnel would be 70, allowing for absences due to vacation, illness or business travel.

- Up to a maximum of 115 Mariner Crew for all NOAA vessels would occur during periodic arrivals and departures on-site. While these are typically distributed among 10 to 20 crew for each vessel and occur randomly from April through October, a worst-case would be all 115 crew each with total of 2 round trips. It is also assumed that one third would use public transportation or carpool.

- Periodic on-site contractors and infrequent visitors would typically consist of 10 individuals resulting in 40 total trips per year for ship repair and other business, and 8 permanent on-site contractors each arriving and departing during non-peak weekday hours.

- Periodic arrival/departure of researchers taking working cruises on NOAA vessels would occur. Overall, approximately 70 researchers each with 2 round trips per year would occur, primarily from March to October. It is assumed that about one third would use shuttle/carpool from a common distant origin (i.e., WRC in Seattle, NOAA Fisheries laboratories, national marine sanctuary offices).

- Deliveries:

  – Deliveries from large trucks (semis, tractor-trailer units etc.) occur mainly during winter, with a maximum of ten per month. Much less frequent trips occur during

cruise season from March through October (about 1-3 per month).

- Deliveries from smaller trucks (e.g., UPS and Federal Express) occur every day. Other five-ton delivery trucks visit site daily. It is assumed that these deliveries occur during non-peak hours.

- Service trucks would enter and leave a maximum of once per day to unload waste oil, solid waste, bilge water with oily waste, etc. from ships during November through March only.

Based on the above information, and information from existing uses, the trip generation for the project was developed and is summarized in **Table 5.14-2** below.

Table 5.14-2: Trip Generation

		Daily Trips		A.M. Peak Hour					P.M. Peak Hour				
Staff	**Frequency**	**Rate**	**Total**	**Rate**	**In:Out**	**In**	**Out**	**Total**	**Rate**	**In:Out**	**In**	**Out**	**Total**
NOAA Staff	70 / day	2	140	1.0	95:05	133	7	140	1.0	95:05	133	7	140
Vessel Mariner Crew	115 /year (Apr-Oct)	1.4	161	0.7	95:05	107	6	113	0.7	95:05	75	4	79
Contractors	18 / year	2	36	1.0	95:05	34	2	36	1.0	95:05	34	2	36
Researchers	70 / year	1.4	98	0.7	95:05	65	3	69	0.7	95:05	46	2	48
Deliveries	10 / month		20	0.5	95:05	10	1	10	0.2	95:05	2	0	2
Total			**455**			**349**	**18**	**367**			**290**	**15**	**305**

Based on the projected use and data provided, it is projected that the proposed action at Site Alternative 2 would generate approximately 455 daily trips, with approximately 367 trips occurring during the a.m. peak hour and approximately 305 trips occurring during the p.m. peak hour.

The trip generation summarized above represents a worst-case scenario. The trip generation assumes that all of the trips would occur on the same day, even though the possibility of such an occurrence is minimal.

Based on the projected trips from the proposed action at Site Alternative 2, the limited size of the proposed land use, and the transportation infrastructure within the immediate vicinity of the site, the proposed action is not expected to result in a significant impact to vehicle traffic.

With respect to the existing use of the site as a parking lot, the proposed action would require vehicles currently using the site to find parking elsewhere in the vicinity. However, as the use of the site as a parking lot is a recent occurrence (since cessation of log handling operations on the site in the last few months), this is considered to have negligible effects.

5.14.3.3 Mitigation Measures

No mitigation measures are recommended in relation to transportation for Site Alternative 2.

5.14.4 Site Alternative 3: Bellingham

5.14.4.1 Existing Environment

The site is located within the city limits of Bellingham, Washington. The proposed site would be accessed via Cornwall Avenue, a two-lane undivided roadway (one lane in each direction).

The I-5 is located approximately one mile east of the site. Northbound (e.g., from Seattle) or southbound (e.g., from Bellingham International Airport) traffic on the I-5 would likely access the site via exit 253 at Lakeway Drive, along East Holly Drive and south on Cornwall Avenue. Local traffic from areas of Bellingham to the north, west or east would also most likely access the site by travelling south along Cornwall Avenue. Local traffic accessing the site from areas of south Bellingham would most likely access the site via South State Street/Boulevard Street, onto Wharf Street then Cornwall Avenue.

Public transportation in the site vicinity is provided by the Whatcom Transportation Authority. Bellingham Station (hub for all bus routes) is located approximately 4,500 feet northeast of the site. The nearest bus route passes along Boulevard and State Streets, approximately 1,000 feet to the southeast. Bus services along this route operate seven days per week, and run approximately every 15-30 minutes on week days, between Fairhaven and Bellingham Station/downtown (Whatcom Transportation Authority, 2009).

The majority of the site is currently vacant and unused, except for the former maintenance shop and several shipping containers which are used for storage.

5.14.4.2 Environmental Consequences

Under the proposed action at Site Alternative 3, the following changes in traffic generation are anticipated at the site:

- The maximum number of on-site NOAA staff, such as officers, engineers and administrative personnel would be 70, allowing for absences due to vacation, illness or business travel.

- Up to a maximum of 115 Mariner Crew for all NOAA vessels would occur during periodic arrivals and departures on-site. While these are typically distributed among 10 to 20 crew for each vessel and occur randomly from April through October, a worst-

case would be all 115 crew each with total of 2 round trips. It is also assumed that one third would use public transportation or carpool.

- Periodic on-site contractors and infrequent visitors would typically consist of 10 individuals resulting in 40 total trips per year for ship repair and other business, and 8 permanent on-site contractors each arriving and departing during non-peak weekday hours.

- Periodic arrival/departure of researchers taking working cruises on NOAA vessels would occur. Overall, approximately 70 researchers each with 2 round trips per year would occur, primarily from March to October. It is assumed that about one third would use shuttle/carpool from a common distant origin (i.e., WRC in Seattle, NOAA Fisheries laboratories, national marine sanctuary offices).

- Deliveries:

  – Deliveries from large trucks (semis, tractor-trailer units etc.) occur mainly during winter, with a maximum of ten per month. Much less frequent trips occur during cruise season from March through October (about 1-3 per month).

  – Deliveries from smaller trucks (e.g., UPS and Federal Express) occur every day. Other five-ton delivery trucks visit site daily. It is assumed that these deliveries occur during non-peak hours.

  – Service trucks would enter and leave a maximum of once per day to unload waste oil, solid waste, bilge water with oily waste, etc. from ships during November through March only.

Based on the above information, and information from existing uses, the trip generation for the project was developed and is summarized in **Table 5.14-3** below.

Table 5.14-3: Trip Generation

		Daily Trips		A.M. Peak Hour					P.M. Peak Hour				
Staff	**Frequency**	**Rate**	**Total**	**Rate**	**In:Out**	**In**	**Out**	**Total**	**Rate**	**In:Out**	**In**	**Out**	**Total**
NOAA staff	70 / day	2	140	1.0	95:05	133	7	140	1.0	95:05	133	7	140
Vessel Mariner Crew	115 /year (Apr-Oct)	1.4	161	0.7	95:05	107	6	113	0.7	95:05	75	4	79
Contractors	18 / year	2	36	1.0	95:05	34	2	36	1.0	95:05	34	2	36
Researchers	70 / year	1.4	98	0.7	95:05	65	3	69	0.7	95:05	46	2	48
Deliveries	10 / month		20	0.5	95:05	10	1	10	0.2	95:05	2	0	2
Total			**455**			**349**	**18**	**367**			**290**	**15**	**305**

Based on the projected use and data provided it is projected that the proposed action at Site Alternative 3 would generate approximately 455 daily trips, with approximately 367 trips occurring during the a.m. peak hour and approximately 305 trips occurring during the p.m. peak hour.

The trip generation summarized above represents a worst-case scenario. The trip generation assumes that all of the trips would occur on the same day, even though the possibility of such an occurrence is minimal.

Based on the projected trips from the proposed action at Site Alternative 3, the limited size of the proposed land use, and the transportation infrastructure within the immediate vicinity of the site, the proposed action is not expected to result in a significant impact to vehicle traffic.

5.14.4.3 Mitigation Measures

No mitigation measures are recommended in relation to transportation for Site Alternative 3.

5.14.5 Site Alternative 4: Newport

5.14.5.1 Existing Environment

The site is located within the city limits of Newport, Oregon. The proposed site would be accessed via Southeast OSU Drive. Southeast OSU Drive is a two-lane undivided roadway (one lane in either direction). The Oregon Department of Transportation (ODOT) has established a Community Threshold Level of 500 vehicles per day (Edwards, 2000).

The US 101 is located approximately 3,000 feet west of the site. Southbound traffic on the US 101, including all local traffic from downtown Newport and other areas north of Yaquina Bay, would access the site via the off-ramp at SW Abalone Street, and along SE OSU Drive. Northbound traffic on the US 101 would access the site via the off-ramp at South Pacific Way, and along SE OSU Drive. Local traffic from the South Beach area of Newport (south of site) would most likely access the site either via SW Abalone Street onto SE OSU Drive, or via SE Ferry Slip Drive and SE Marine Science Drive, onto SE OSU Drive.

Public transportation in the site vicinity is provided by Lincoln County Transit, and consists of a single loop bus route around the Newport and South Beach areas. The nearest bus stop to the site is at the Hatfield Marine Science Center, immediately to the east of the site. Bus services along this route operate seven days a week, but only run five times per day (Lincoln County Transit, 2009).

The site is currently used for fruit processing and fish buying operations. As a result of the proposed action, the fish buying operations would cease, and the fruit processing would relocate slightly, so that it is contained on adjacent land to the south of the site.

5.14.5.2 Environmental Consequences

Under the proposed action at Site Alternative 4, the following changes in traffic generation are anticipated at the site:

- The maximum number of on-site NOAA staff, such as officers, engineers and administrative personnel would be 70, allowing for absences due to vacation, illness or business travel.

- Up to a maximum of 115 Mariner Crew for all NOAA vessels would occur during periodic arrivals and departures on-site. While these are typically distributed among 10 to 20 crew for each vessel and occur randomly from April through October, a worst-case would be all 115 crew each with total of 2 round trips. It is also assumed that one third would use public transportation or carpool.

- Periodic on-site contractors and infrequent visitors would typically consist of 10 individuals resulting in 40 total trips per year for ship repair and other business, and 8 permanent on-site contractors each arriving and departing during non-peak weekday hours.

- Periodic arrival/departure of researchers taking working cruises on NOAA vessels would occur. Overall, approximately 70 researchers each with 2 round trips per year would occur, primarily from March to October. It is assumed that about one third would use shuttle/carpool from a common distant origin (i.e., WRC in Seattle, NOAA Fisheries laboratories, national marine sanctuary offices).

- Deliveries:

  – Deliveries from large trucks (semis, tractor-trailer units etc.) occur mainly during winter, with a maximum of ten per month. Much less frequent trips occur during cruise season from March through October (about 1-3 per month).

  – Deliveries from smaller trucks (e.g., UPS and Federal Express) occur every day. Other five-ton delivery trucks visit site daily. It is assumed that these deliveries occur during non-peak hours.

– Service trucks would enter and leave a maximum of once per day to unload waste oil, solid waste, bilge water with oily waste, etc. from ships during November through March only.

Based on the above information, and information from existing uses, the trip generation for the project was developed and is summarized in **Table 5.14-4** below.

Table 5.14-4: Trip Generation

		Daily Trips		A.M. Peak Hour					P.M. Peak Hour				
Staff	**Frequency**	**Rate**	**Total**	**Rate**	**In:Out**	**In**	**Out**	**Total**	**Rate**	**In:Out**	**In**	**Out**	**Total**
NOAA Staff	70 / day	2	140	1.0	95:05	133	7	140	1.0	95:05	133	7	140
Vessel Mariner Crew	115 /year (Apr-Oct)	1.4	161	0.7	95:05	107	6	113	0.7	95:05	75	4	79
Contractors	18 / year	2	36	1.0	95:05	34	2	36	1.0	95:05	34	2	36
Researchers	70 / year	1.4	98	0.7	95:05	65	3	69	0.7	95:05	46	2	48
Deliveries	10 / month		20	0.5	95:05	10	1	10	0.2	95:05	2	0	2
Total			**455**			**349**	**18**	**367**			**290**	**15**	**305**

Based on the projected use and data provided it is projected that the proposed action at Site Alternative 4 would generate approximately 455 daily trips, with approximately 367 trips occurring during the a.m. peak hour and approximately 305 trips occurring during the p.m. peak hour. ODOT's Community Threshold Level of 500 vehicles per day would not be exceeded.

The trip generation summarized above represents a worst-case scenario. The trip generation assumes that all of the trips would occur on the same day, even though the possibility of such an occurrence is minimal.

Based on the projected trips from the proposed action at Site Alternative 4, the limited size of the proposed land use, and the transportation infrastructure within the immediate vicinity of the site, the proposed action is not expected to result in a significant impact to vehicle traffic.

5.14.5.3 Mitigation Measures

No mitigation measures are recommended in relation to transportation for Site Alternative 4.

5.15 UTILITIES AND SOLID WASTE

There are no directly applicable federal 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), they strive to assess potential effects of projects and conform to local requirements to the extent practicable. This assessment

considers the apparent capacity of utility services and the effects of extending those services to the project area.

5.15.1 No-Action Alternative

5.15.1.1 Existing Environment

The No-Action Alternative assumes continuation of upland activities at the existing MOC-P site on Lake Union, and continuation of water-based activities (ship berthing, etc) at various temporary locations around Lake Union and the Seattle area, as described in Section 4.3 above. The existing environment of the Lake Union area in relation to utilities and solid waste is described more fully in Section 5.15.2.1 below.

5.15.1.2 Environmental Consequences

No changes to existing conditions are proposed under the No-Action Alternative. Therefore there would be no impact on utilities and solid waste.

5.15.1.3 Mitigation Measures

No mitigation measures with respect to utilities and solid waste are recommended under the No-Action Alternative.

5.15.2 Site Alternative 1: Lake Union

5.15.2.1 Existing Environment

The site has been operating as NOAA's MOC-P homeport facility for several decades, and has adequate electricity, water, gas, and telephone services to the site, for the existing upland operations. Sewage, solid waste and stormwater infrastructure also exists at the site.

Existing utilities on the piers and wharf were likely damaged in the 2006 fire.

The City of Seattle has two utility departments: Seattle City Light provides electric power; and Seattle Public Utilities provides water, sewer, and solid waste services. Commercial garbage collection services are provided by CleanScapes Inc., on contract to Seattle Public Utilities. The city water supply is sourced from the Cedar River and South Fork Tolt River Watersheds in eastern King County (City of Seattle, 2009c).

Electricity utilities within Seattle are also provided by Puget Sound Energy. Natural Gas utilities are provided by Cascade Natural Gas Corporation.

5.15.2.2 Environmental Consequences

The proposed action at Site Alternative 1 includes the repair of the fire damaged piers and wharf. Electricity, water, sewer and communication services would be extended to the berths and utility hook-up junction boxes provided at several locations on the two new piers. No change in the demand on utility services that existing prior to the fire (July 2006) would result. Utilities now provided to this portion of Lake Union are similar to the type and level of service required by MOC-P. It is anticipated that the existing utility services are adequate for the proposed action at Site Alternative 1.

5.15.2.3 Mitigation Measures

No mitigation measures with respect to utilities and solid waste are recommended under Site Alternative 1.

5.15.3 Site Alternative 2: Port Angeles

5.15.3.1 Existing Environment

The City of Port Angeles Public Works and Utilities Department (Public Works) provides water to users within the city, and limited areas outside the city boundaries. The water supply is obtained from a 60 foot deep Collector Well next to the Elwha River which is a few miles west of the city. The well and pumping system is designed to provide 11 million gallons per day. A new water treatment plant is currently under construction.

The City of Port Angeles has a municipal electric utility, which purchases its power from the Bonneville Power Administration and operates the Morse Creek hydro facility. The Bonneville Power Administration has a substation in Port Angeles and all power to the city is delivered over the Administration's transmission system and through their substation. The capacity of the transmission system and substation is 300 MW. On its website, the city states that Port Angeles can accommodate the future power needs of almost any type of customer (City of Port Angeles Public Works, 2009a).

The City of Port Angeles Public Works' Wastewater Utility provides for the collection and treatment of wastewater received from residential, commercial and industrial uses within the city. The wastewater system has 117 miles of sanitary and combined sewers ranging from 4 to 48 inches in diameter, 10 pump stations, and about 7,200 service connections. The secondary wastewater treatment plant has capacity projected to be adequate until 2010 and a design population of 24,800.

Natural gas utilities are not available in Port Angeles (City of Port Angeles, 2009d).

The City of Port Angeles Public Works' Solid Waste Utility operates and maintains the city's solid waste collection system and contracts recycling services with Waste Connections, Inc. Waste Connections, Inc. operates the Regional Transfer Station and the Blue Mountain Transfer Station under contract with the City of Port Angeles. Garbage collection services operate six days a week for commercial customers. The Regional Transfer Station opened in 2007 (City of Port Angeles, 2009b).

The existing Terminal 3 facility currently has potable water, electricity, telephone, lights and garbage services.

5.15.3.2 Environmental Consequences

The proposed action at Site Alternative 2 includes the following new utilities:

- A potable water supply would be extended along the length of the new pier. This is anticipated to consist of 2-inch line, with ten double hose bibs spaced evenly along the pier (five on each side).
- The existing 600-amp, 480-volt, 3-phase power would also be extended to the end of the new pier.
- Sanitary sewer would also be provided on the new pier, including seven quick-connect stanchions spaced along the one side of the pier, and anticipated 4-inch lines.
- Utility lines and pipes would be hung underneath the pier.
- Fire protection services would be available on the extended pier, including seven fire standpipes evenly spaced along one side of the pier.

Coordination with local utility providers to extend service to the project area would be required. It is anticipated that services absent at or near the subject site, such as natural gas, could be provided by extending commercial service from the nearest available source.

5.15.3.3 Mitigation Measures

No mitigation measures with respect to utilities and solid waste are recommended under Site Alternative 2.

5.15.4 Site Alternative 3: Bellingham

5.15.4.1 Existing Environment

The City of Bellingham Public Works Department provides water service to customers in the city of Bellingham. The Public Works Department supplies drinking water from Lake Whatcom, located on the east side of the city. A 24-inch potable water main extends north-south along Chestnut Street and connects with a 16-inch diameter pipe that extends southwest along Cornwall Avenue. The Cornwall main reduces down to a 12-inch diameter and continues southwest towards the Bellingham Shipping Terminal. A 12-inch main enters the site along Beal Memorial Way providing both potable water and fire flow to the site (Port of Bellingham, 2008).

The City of Bellingham Public Works also provides sewer service to customers in the city. Sanitary sewage service to the site is provided by a 10-inch concrete pipe installed in 1968 on the west side of Beal Memorial Way. This pipe currently provides service to two on-site domestic users and gravity flows to the Pine Street Pump Station and then on to the Oak Street Pump Station (Port of Bellingham, 2008).

Commercial garbage services in Bellingham are provided by the Sanitary Service Company under contract to the City. Customized waste collection service is available to all commercial customers. Containers range in size from 60 gallons to 40 cubic yards. Collection is available weekly, every other week, monthly or on-call (Sanitary Service Company, 2009). The Sanitary Service Company does not accept hazardous, toxic, radioactive or dangerous wastes. The Disposal of Toxics program accepts chemical wastes from businesses, with prior approval.

Puget Sound Energy provides electricity to the City via 14 distribution substations (<55 kilovolts) and two transmission substations (>55 kilovolts). Electrical service to the surrounding area is provided by two 115 kilovolt transmission lines located on utility poles along each side of Laurel Street (Port of Bellingham, 2008). Utility poles along Beal Memorial Way provide electricity to the former maintenance shed and Warehouse One.

Natural gas service to the site area is provided by Cascade Natural Gas. A 16-inch high-pressure natural gas distribution line is present along Cornwall Avenue, with a regulator station located at the west end of Cornwall Avenue (Port of Bellingham, 2008).

5.15.4.2 Environmental Consequences

No substantial effects from access to or extension of utility services are expected to occur under the proposed action at Site Alternative 3.

5.15.4.3 Mitigation Measures

No mitigation measures with respect to utilities and solid waste are recommended under Site Alternative 3.

5.15.5 Site Alternative 4: Newport

5.15.5.1 Existing Environment

Water and wastewater services in the area are provided by the City of Newport Public Works Department. The majority of the water supply is obtained from Big Creek and Siletz Creek, via a system of reservoirs and a water treatment system. The plant is in excess of 50 years of age and has several deficiencies causing operational difficulties and vulnerabilities. During peak demand seasons, the 50-year old plant often operates for 24 hours a day but is still unable to maintain storage tank levels in the system, and is essentially at the end of its useful life. The City of Newport's distribution system consists of over 90 miles of piping and 6 booster pump stations. The City operates over nine separate pressure levels due to the variety of elevations in the system. Fire protection is provided throughout the system, with good coverage except for limited areas that have deficient spacing between hydrants.

Electricity services are provided to the Newport area by the Central Lincoln People's Utility District. Solid waste services are provided by Thompson Sanitary Service. Gas utilities in the Newport area are provided by Northwest Natural.

The site currently has overheard 3-phase electricity, provided by the Central Lincoln People's Utility District, along the western boundary of OSU Drive. Existing underground telephone, gas and sewer utilities are located along a similar corridor to the existing overheard power lines and a14-inch fire main is present along OSU Drive.

The 365 kilowatt diesel generator that is currently located within the existing pumphouse (which would be demolished), would be retained and used as a backup generator for the NOAA operations.

5.15.5.2 Environmental Consequences

The existing power supply to the site would need to be upgraded to meet NOAA requirements, from a source approximately 1500 feet to the south. The new supply is likely to be underground, rather than overhead.

5.15.5.3 Environmental Consequences

No substantial effects from access to or extension of utility services are expected to occur under the proposed action at Site Alternative 3.

5.15.5.4 Mitigation Measures

No mitigation measures with respect to utilities and solid waste are recommended under Site Alternative 4.

5.16 VISUAL AND AESTHETIC RESOURCES

This section evaluates the impact of the proposed project on the visual character and context of affected environments. Each Site Alternative for the proposed action has the potential for some level of sensitivity to arise relative to visual change to the environment. The evaluation of project-related aesthetic effects associated with noise is discussed separately in Section 5.13 of this EA.

Key considerations are the presence of designated or unique scenic resources within the viewshed of the proposed project, the potential for receptor sensitivity to the proposed action from those resources, and the magnitude of the proposed action's relative conspicuity or discordant effect to those receptors. For this analysis, scenic resources are typically associated national, state or local parks, areas adjacent to designated wild and scenic rivers, and regionally scenic byways, routes or views from designated viewing areas. The potential for adverse visual effects is higher for the proposed action when it occurs within highly differing land use zones, such as within a conservation zone.

Visual assessment techniques are used that characterize visual impact in terms of changes in visual quality, character, and viewer sensitivity. Visual quality levels were estimated for both regional and immediate project area settings. The regional landscape setting is defined as upland areas extending beyond a distance of 0.5 miles. Levels of visual quality and viewer sensitivity were qualitatively estimated based upon general criteria that establish ratings of "High," "Moderate," or "Low."

Levels of visual quality consist of three primary components: *vividness*, the memorability of the landscape resulting from distinctive landmark features or visual patterns; *intactness*, the visual integrity between natural and modified landscape components and the absence of encroaching disturbances; and *unity*, the visual coherence, composition, and harmony of landscape elements. Visual quality was evaluated using the following general criteria:

- **Low** - Landscape is common to the region and exhibits few, if any, memorable features or patterns which provide visual diversity.
- **Moderate** - Landscape exhibits reasonably attractive natural and human-made features or patterns, although they are not visually distinctive or unusual within the region. The landscape integrity of the area provides some positive visual experiences.

- **High** - Landscape exhibits distinctive and memorable visual features (such as landforms and outcrops) and patterns (vegetation/open space) which are largely undisturbed--usually a rural or open space setting.

Viewer sensitivity is dependent on viewer types and exposure (number of viewers and view frequency), view orientation and duration, and viewer awareness and sensitivity to visual changes. Levels of viewer sensitivity were evaluated using the following criteria:

- **Low** - Low visual sensitivity include areas where viewer activities typically limit awareness and sensitivity to the visual setting.
- **Moderate** - Moderate visual sensitivity consist of trails, highway and other travelers, particularly for destination travelers whom often have a focused orientation.
- **High** - Residential and recreational viewers and those congregating in public gathering places (such as churches and schools) are considered to have comparatively high visual sensitivity.

5.16.1 No-Action Alternative

5.16.1.1 Existing Environment

As previously discussed, the existing environment for the No-Action Alternative is primarily associated with the leased property used for administrative and warehouse functions at the current MOC-P at Lake Union in Seattle, Washington. The upland and in-water areas are a mix of industrial (drydock), commercial/recreational (marinas) and residential (houseboats and adjacent neighborhoods). The visual setting includes the burnt pier, wharf and building structures within the property, and other structures unaffected by fire. The local visual setting is considered to be Low and the regional setting is Moderate. Relative local sensitivity is low (in industrial/commercial areas) to moderate (in residential areas). No areas of high sensitivity or visual quality are present.

5.16.1.2 Environmental Consequences

No change to the existing visual setting would occur under this alternative. From a regional context this alternative would have a negative effect overall. The No-Action Alternative does not require that burnt piers and wharf areas be renovated or redeveloped, a condition that would tend to maintain or degrade the already Low visual quality due to that condition. This negative effect would be moderate.

5.16.1.3 Mitigation Measures

No mitigation measures are recommended relative to visual and aesthetic resources under the No-Action Alternative.

5.16.2 Site Alternative 1: Lake Union

5.16.2.1 Existing Environment

As previously discussed, the existing environment under Site Alternative 1 is primarily associated with waterfront and upland functions at the property currently lease for MOC-P at Lake Union in Seattle, Washington. The upland and in-water areas are a mix of industrial (drydock), commercial/recreational (marinas) and residential (houseboats and adjacent neighborhoods). The visual setting includes the burnt pier, wharf and building structures within the property, and other structures unaffected by fire. The local visual setting is considered to be Low and the regional setting is Moderate. Relative local sensitivity is Low (in industrial/commercial areas) to Moderate (in residential areas). No areas of High sensitivity or visual quality are present.

5.16.2.2 Environmental Consequences

The key change to the existing visual setting under this alternative would be the replacement of burnt piers, wharf and upland structures with similar development. From a local context this alternative would have a positive effect overall, effectively improving the setting from Low to Moderate. No substantive change to the regional setting would result. The overall positive effect would be minor.

King County Shoreline Management Master Plan considers key development guidelines and goals for piers and moorages by recommending that floating pier construction should be preferred in those areas where scenic values are High (King County 1978). The visual setting and associated local and regional scenic values are considered less than High. Overall, the anticipated visual impact would be positive, albeit minor.

5.16.2.3 Mitigation Measures

No mitigation measures are recommended relative to visual and aesthetic resources under Site Alternative 1.

5.16.3 Site Alternative 2: Port Angeles

5.16.3.1 Existing Environment

The existing environment under Site Alternative 2 is primarily associated with industrial and commercial waterfront and upland functions within the Port of Port Angeles and Port Angeles Harbor. The upland and in-water areas are a mix of industrial (log handling, cargo handling) and commercial/recreational (marina), with residential neighborhoods approximately one-half mile south beyond the edge of a coastal escarpment.

The local visual setting includes gravel and asphalt land, several on- and off-site warehouse structures, and commercial enterprises. The site includes adjacent waterfront previously established through fill deposition, working pier terminals, and remnant yards for floating logs. The local visual setting is considered to be Low and the regional setting is Low to Moderate. Relative local sensitivity is Low (in industrial/commercial areas), and is regionally Moderate (for limited segments of residential areas). No areas of high sensitivity or visual quality are present.

5.16.3.2 Environmental Consequences

The key change to the existing visual setting under this alternative would be the addition of pier length to the existing terminal, berthing of up to six vessels, and the addition of upland structures for administrative/warehouse/shop functions. These proposed features would be similar to existing activities and other development at and near the subject site. From a local context this alternative would have a positive effect overall, effectively improving the setting from Low to Moderate through improvements to vacant or underutilized land areas no long supporting log handling operations. Proposed architectural and landscape designs are expected to improve the aesthetic value of the immediate area. No substantive change to the regional setting would result. The overall positive effect would be minor.

5.16.3.3 Measures

No mitigation measures are recommended relative to visual and aesthetic resources under Site Alternative 2.

5.16.4 Site Alternative 3: Bellingham

5.16.4.1 Existing Environment

The existing environment under Site Alternative 3 is primarily associated with existing and industrial and commercial waterfront and upland functions within the Port of Bellingham, the Whatcom Waterway and Bellingham Bay. The upland and in-water areas are primarily industrial (large vessel lay berths, cargo handling), with commercial and residential land uses

within approximately one-half mile eastward. The site is in close proximity to the urban core of the city of Bellingham.

The local visual setting includes gravel and asphalt land, several on- and off-site warehouse structures, commercial enterprises, and remnant land features from former industrial/manufacturing operations. The site includes adjacent waterfront established through fill deposition, working pier terminals and remnant yards for salt loading and storage. The local visual setting is considered to be Low and the regional setting is Moderate. Relative local sensitivity is Low (in industrial/commercial areas), and is regionally considered to be Moderate (for limited segments of the urban core and existing/planned redevelopment areas). No areas of high sensitivity or visual quality are present.

5.16.4.2 Environmental Consequences

The key change to the existing visual setting under this alternative would be the minor addition of in-water structures (piles and mooring dolphins) to the existing terminal and the addition of upland structures for administrative/warehouse/shop functions. These proposed features would be similar to existing development at and near the subject site. From a local context this alternative would have a positive effect overall, effectively improving the setting from Low to Moderate through improvements to vacant or underutilized areas no longer supporting industrial operations. Proposed architectural and landscape designs are expected to improve the aesthetic value of the immediate area. No substantive change to the regional setting would result; however, the proposed action would be consistent with future redevelopment of adjacent properties along the Whatcom Waterway. The overall positive effect would be minor.

5.16.4.3 Mitigation Measures

No mitigation measures are recommended relative to visual and aesthetic resources under Site Alternative 3.

5.16.5 Site Alternative 4: Newport

5.16.5.1 Existing Environment

The Yaquina Bay Bridge is a major aesthetic landmark on Yaquina Bay. Views associated with the ocean have relegated the river and bay scenes to secondary importance. For this reason, the *Visual Resource Analysis of the Oregon Coastal Zone* classified the whole of Yaquina bay as an area with a “less obvious coastal association” than the ocean beaches or Yaquina Head. The affected waterfront and affected viewshed consists of deep-water port development for vessels associated with commercial, research/education and recreational activities.

The affected portion of South Beach and Yaquina Bay would be seen from waterfront commercial segments (north shore) of the city of Newport, and partial views from the Yaquina Bay Bridge in the opposite direction of the Pacific Ocean.

The visual quality of the immediate site is Low to Moderate, while regionally it is considered Moderate (non-ocean views from Yaquina Bay Bridge).

5.16.5.2 Environmental Consequences

The visual effect is considered to be moderate given the site's proximity to views from the U.S. 101 off ramps and the Yaquina Bay Bridge, and direct views from commercial/retail waterfronts supporting tourism. However, the proposed action would not be out of character with existing waterfront uses. While the presence of a replacement pier supporting up to six NOAA research vessels may be considered conspicuous, the proposed action is consistent with zoning and planned use of the site location and would not result in a discordant or inconsistent visual effect. No significant adverse visual impact would result from the proposed action at Site Alternative 4.

5.16.5.3 Mitigation Measures

No mitigation measures are recommended relative to visual and aesthetic resources under Site Alternative 4.

5.17 HAZARDOUS MATERIALS

Hazardous materials handling and hazardous waste management are subject to numerous laws and regulations at all levels of government. State and federal laws require detailed planning to ensure that hazardous materials are properly handled, used, stored, and disposed of, and, in the event that such materials are accidentally released, to prevent or to mitigate injury to health or the environment. Hazardous materials storage and reporting requirements, known as Tier II Requirements, have been delegated to the States by the USEPA.

In the state of Washington, these are managed by the Community Right-to-Know unit of the WDOE. In Oregon, these are managed by the Hazardous Substance Information Survey managed by the Office of the Fire Marshal. Additional reporting requirements in Oregon are mandated by the *Toxics Use and Hazardous Waste Reduction Act.*

The federal Occupational Safety and Health Administration (Fed/OSHA), and state-level programs in both Washington (Washington State Department of Labor and Industries) and Oregon (Oregon Occupational Safety and Health Division) are the agencies responsible for assuring worker safety in the workplace. The state programs apply to any construction activity that may release lead dust or fumes. The removal and handling of ACM in Washington is

governed primarily by USEPA regulations under Title 40 CFR; in Oregon, additional regulations have been established by ODEQ in OAR 340 Division 248.

Fed/OSHA also has a survey requirement under Title 29 CFR. These regulations require facilities to take all necessary precautions to protect employees and the public from exposure to asbestos. WDOE and ODEQ regulate the generation, transportation, treatment, storage, and disposal of hazardous waste under RCRA, in Washington and Oregon respectively. These laws impose "cradle to grave" regulatory systems for handling hazardous waste in a manner that protects human health and the environment.

Phase I Environmental Site Assessments (Phase I ESAs) have been prepared for all four Site Alternatives under consideration. URS reviewed the Phase I ESAs submitted with initial offers for each of the Site Alternatives and provided its findings to NOAA (URS, 2009), who have requested additional information in relation to some of the Phase I ESAs. Phase I ESAs are generally performed in conformance with the scope of limitations of the American Society of Testing Materials Practice E1527-05 (the ASTM practice) for the purpose of identifying recognized environmental conditions (RECs). The Phase I ESAs accepted by NOAA for each Site Alternative are intended to satisfy one of the requirements to qualify for the innocent landowner, contiguous property owner or bona fide prospective purchaser limitations on liability under the Comprehensive Environmental Response, Compensation and Liability Act.

This analysis considers project-related effects on identified RECs (e.g., effects on contaminated soil, groundwater or sediments), as well as the potential for release of additional hazardous materials during construction, operation and maintenance activities under the proposed action.

5.17.1 No-Action Alternative

5.17.1.1 Existing Environment

The No-Action Alternative assumes continuation of upland activities at the existing MOC-P site on Lake Union, and continuation of water-based activities (ship berthing, etc.) at various temporary locations around Lake Union and the Seattle area, as described in Section 4.3 above. The existing environment of the Lake Union area in relation to hazardous materials is described more fully in Section 5.17.2.1 below.

5.17.1.2 Environmental Consequences

There would be no change to the existing site conditions and no proposed construction under the No-Action Alternative. Therefore, the No-Action Alternative would have no impacts with respect to hazardous materials.

5.17.1.3 Mitigation Measures

No mitigation measures related to hazardous materials are recommended for the No-Action Alternative.

5.17.2 Site Alternative 1: Lake Union

5.17.2.1 Existing Environment

The site has until recently been used as NOAA's MOC-P homeport facility, and is currently for its land-based activities only. The site contains a Hazardous Material Storage Area (HMSA) at the north end of the property, which contains approximately two dozen 55-gallon drums of petroleum products, antifreeze, and other automotive and motor fluids, along with several 5-gallon buckets of paints, sealants and petroleum products. Flammable storage cabinets are present within the warehouse/laboratory building, along with small quantities of paints, sealants and adhesives within the carpentry area.

A Phase I ESA was undertaken for this site in January 2009 (GeoEngineers, 2009), which identified the following potential or RECs in connection with the site:

- The presence of metals (lead) and carcinogenic polycyclic aromatic hydrocarbons at concentrations above Model Toxics Control Act (Chapter 70.105D RCW) Method A cleanup levels, and petroleum at concentrations below current cleanup levels, in soils in the vicinity of the HMSA at the north end of the property.

- The fill material beneath the site is contaminated in isolated locations with metals (lead) and polyaromatic hydrocarbons (PAHs).

- The presence of arsenic has been detected in groundwater at a concentration above Model Toxics Control Act Method A cleanup levels, at one monitoring site well in the center of the property, possible due to the close proximity of treated wood timbers in the subsurface.

- The July 2006 fire and subsequent damage to the piers, wharf, boatshed and shop building are identified as a potential REC, as hazardous materials may have been released as a result of the fire.

- The current use and storage of hazardous materials within the HMSA and elsewhere on the property are identified as a potential REC, although the ESA notes that the potential for release could be minimized through continued implementation of appropriate hazardous materials BMPs. Approximately two dozen 55-gallon drums of petroleum

products, antifreeze and similar automotive and motor fluids were present within the HMSA at the time the Phase I ESA was undertaken.

The presence of contaminated sediments in Lake Union identified in an earlier Phase I ESA (GeoEngineers, 1996) is not identified as an REC within the 2009 Phase I ESA, as it is considered "off-site," however the report notes that future cleanup of lakebed sediments would need to be completed as a portion of a collaborative lake-wide remediation effort. It is noted that the site includes approximately 6.35 acres of lakebed, therefore this potential REC is considered to be on site.

The Phase I ESA recommended that the following maintenance and operational monitoring efforts be undertaken at the site:

- Maintenance of the existing impervious 'cap' of asphalt and/or buildings over the majority of the site
- Monitoring of existing groundwater monitoring wells on site for water quality
- Implementation of an appropriate soil handling and disposal approach, if soil on the site is disturbed by redevelopment activities.

There is known ACM within some of the existing buildings on site, including vinyl floor tile, air conditioning caulking and some roofing materials (Shannon & Wilson, 2002). There is also potential for subsurface migration of hazardous materials from adjacent properties, which formerly contained facilities operated by Tabor/Industrial Electric and Bird-Johnson, respectively. These adjacent properties are known to have been contaminated by historical operations (GeoEngineers, 1996), although the likelihood of subsurface migration onto the subject site is unknown.

5.17.2.2 Environmental Consequences

In its review of the GeoEngineers (2009) Phase I ESA document, URS (2009) noted that there is potential that historical activities on- and off- site may have resulted in contamination to site soil and groundwater, and to lake sediments considered to be within the site. There is a potential that future investigation or remediation of this contamination could result in the excavation, shipment, and disposal of hazardous materials related to this potential contamination, and would thus increase the potential for impacts to worker and public health and safety and to the environment.

No major soil disturbance is required to implement the proposed action at this site, as no major building foundations are required to construct the proposed new shop and boatshed/storage

buildings, or renovate the existing administration or laboratory/warehouse building. The construction of the proposed action at Site Alternative 1 is therefore likely to have a minor effect on known soil or groundwater contaminants at upland portions of the site.

The proposed repair of the fire-damaged piers and wharf would require minor disturbance of lakebed sediments, associated with the installation of ten new piles for the small vessel dock. There is known contamination of lakebed sediments in Lake Union (GeoEngineers, 1996), however the extent of contamination in the vicinity of proposed lakebed disturbance is unknown at this stage. If the lake sediments in the vicinity of proposed pile installations are contaminated, such disturbance could adversely affect the health and safety of workers, impact water quality within the lake (with associated effects on lacustrine biota), or could result in the migration of contaminants. The proposed disturbance could trigger a requirement for remediation with associated increase in risk of impacts due to the remedial investigation, and subsequent remediation, including potential treatment, excavation, storage, transportation, and disposal of hazardous wastes. Similarly, ongoing operation of the MOC-P homeport facility, once constructed, could impact these potentially contaminated lakebed sediments, e.g., through propeller wash stirring up the bottom sediments.

It is possible that implementation of a remedial investigation to further evaluate potential on-site contamination, including contamination of soil, groundwater and lakebed sediments could further define the presence of potential hazardous contamination at the site. It is assumed that any remedial investigation (and subsequent remediation, if necessary) would comply with all applicable local, state, and federal regulations, with regards to worker and public health and safety, waste management and treatment, excavation, transportation, and disposal of hazardous materials; and may require notification of applicable regulatory agencies.

Preparation work for the proposed renovations of the administration and warehouse/laboratory buildings, and demolition of the boat storage and shop buildings, would require removal of ACM. There is also potential for lead-based paint to be present within these buildings. Demolition of buildings containing ACM or lead-based paint could impact worker health and safety, and the environment, if appropriate mitigation measures are not taken during demolition and during handling and disposal of such materials.

Once constructed and operational, the majority of the upland site would continue to be paved and impervious, particularly in the vicinity of the hazardous waste storage area. The proposed action at Site Alternative 1 would not involve any significant changes to the amount or types of hazardous materials currently being used or stored on upland portions of the site, as the existing MOC-P homeport facilities would continue to operate at this site. The proposed action does not include the installation of any aboveground or underground storage tanks on the site. Current

operations at the site appear to utilize appropriate hazardous material storage and handling procedures, including spill prevention procedures.

Operation of the NOAA facility would result in changes to the use of hazardous materials on the piers and over-water portions of the site, as vessels moored at the site may be fueled via fuel trucks driving on the wharf and piers, which therefore increases the risk of accidental spills or leaks. In addition, if vessels mooring at the facility require hazardous materials to be loaded or unloaded from the vessels, this would also increase the risk of accidental spills or leaks. Provided that the mitigation measures below are implemented appropriately, the use of hazardous materials under the proposed action would have negligible adverse environmental impacts.

5.17.2.3 Mitigation Measures

The following mitigation measures are recommended in relation to hazardous materials and waste. It is assumed that no significant impacts would result provided that recommendations within a Phase I ESA accepted by NOAA are implemented; and that the following measures, or equivalent actions, are undertaken:

- Compliance with WDOE and federal RCRA hazardous waste generation and disposal, and hazardous materials use and storage notification requirements.
- Implementation of an appropriate soil/sediment handling and disposal approach if soil/sediment on the site is disturbed.
- Implementation of an asbestos demolition survey and abatement plan for the proposed building demolitions and proposed renovations of existing buildings. This plan should address, at a minimum, the following items:
    - Compliance with all applicable local, state, and federal regulations for demolition, abatement, and disposal.
    - Asbestos abatement measures, including use of licensed and trained asbestos abatement contractors and (if necessary) encapsulation strategies to protect public health.
    - Air monitoring for worker and public safety.
    - Procedures to properly transport and dispose of potential ACM using licensed haulers and disposal facilities.

- Implementation of a lead-based paint demolition survey and abatement plan for the proposed building demolitions and proposed renovations of existing buildings. This plan should address, at a minimum, the following items:
    - Compliance with all applicable local, state, and federal regulations for demolition, abatement, and disposal,
    - Lead based paint abatement measures, including use of licensed and trained lead based paint abatement contractors,
    - Air monitoring for worker and public safety,
    - Procedures to properly transport and dispose of potential lead based paint containing materials using licensed haulers and disposal facilities.

It is expected that the lessor will satisfy appropriate mitigation measures by following the usual permitting and regulatory requirements.

5.17.3 Site Alternative 2: Port Angeles

5.17.3.1 Existing Environment

The site has until recently been used as a log storage yard, however the majority of the site is now used as a vehicle parking lot. There is a large shed used as a mechanical maintenance shop on the site, within which a number of hazardous materials such as fuel, motor oil, and other lubricating fluids are likely to be stored and used. In addition, there is an aboveground storage tank (AST) containing diesel fuel adjacent to the maintenance shop.

Based on the January 2009 Phase I ESA document for this site (Landau Associates, 2009), the following potential for RECs were identified:

- The presence of a commingled groundwater plume, containing Total Petroleum Hydrocarbons as Diesel (TPH-D), Total Petroleum Hydrocarbons as Gasoline (TPH-G), and BTEX (benzene, toluene, ethylbenzene, and xylenes), over much of the Port of Port Angeles Marine Trades Area. The Marine Trades Area predominantly comprises the properties adjacent to the east of the site (e.g., the Westport Ship Yard), but does include a small portion of the eastern upland areas of the site, as well as the existing Terminal 3 and surrounding nearshore areas within the site. The WDOE lists the Marine Trades Area as a Toxics Cleanup Site, for which an agreed order for remedial investigation and feasibility study was proposed in December 2005 (WDOE, 2005b).

- The presence of TPH-D and TPH-G in soil at concentrations above current Model Toxics Control Act Method A cleanup levels on the eastern side of the site.

- The presence of a TPH-G groundwater plume on the former Unocal Bulk Plant, adjacent to the southwest of the subject property.

- ASTs known to have contained fuels or other potentially hazardous materials, have been or are, present on properties upgradient of the site. Numerous oil and fuel distributors, and petroleum storage and transfer facilities have historically operated on property which is immediately upgradient of the site.

- Historical uses of the site as a railroad and blacksmith and machine shop may have resulted in contamination from creosote-treated railroad ties, solvents, paint, petroleum products, polychlorinated biphenyl (PCB)-containing lubricating oils, and other oil.

- The historical presence of fuel pipelines on or immediately adjacent to the east of the subject property.

- The current use and storage of hazardous materials at the Maintenance Shop located on the northern portion of the site are a possible source of diesel, oil, and VOC contamination.

- The presence of an AST containing diesel fuel along the north side of the maintenance shop. The AST has a concrete basin secondary containment system. At the time of the Phase I ESA site reconnaissance (Landau Associates, 2009), a 5-gallon bucket appearing to contain petroleum products was observed next to the AST.

In addition to the RECs identified above, the historical presence of a “refuse burner” near the northwest corner of the site was identified as a potential REC, since ash from such burners is often contaminated with lead, dioxins and PAHs (URS, 2009).

The Phase I ESA contains the following recommendations:

- Additional action to assess potential for soil & groundwater contamination on the site, and evaluate subsurface conditions.

- Further investigation to assess potential for contamination in marine sediments in sub-tidal areas of the property.

- Documentation of nature & extent of contamination on the subject property (upland & marine), to allow evaluation of need for and type of remedial actions.

- Procedures should be developed to address any potential encounter with hazardous materials during subsurface investigations, excavation or construction on site.

5.17.3.2 Environmental Consequences

In the Phase I ESA performed by Landau Associates, and in subsequent review of that document (URS, 2009), multiple historical activities were noted on- and off-site that may have resulted in contamination to site soil and groundwater, and to lake sediment considered to be within the site.

It is possible that implementation of a remedial investigation to further evaluate potential on-site contamination, including contamination of soil, groundwater and lakebed sediments could further define the presence of potential hazardous contamination at the site. It is assumed that any remedial investigation (and subsequent remediation, if necessary) would comply with all applicable local, state, and federal regulations, with regards to worker and public health and safety, waste management and treatment, excavation, transportation, and disposal of hazardous materials; and may require notification of applicable regulatory agencies.

Construction under the proposed action would require the installation of foundations for proposed buildings and piles for the pier extension. Dredging of the nearshore area would also be undertaken to create appropriate water depths for operation of the proposed action. The existing bridge and associated sheet piling at the mouth of Tumwater Creek would be replaced, while other railway trestles currently crossing the creek would be removed.

The majority of known upland subsurface contamination is in the eastern area of the site and adjacent to the east and southwest of the site, while the majority of upland soil disturbance is proposed within the center (warehouse/shop building) and northwest (administration building) areas of the site. However, the proposed replacement of the bridge, sheet piling and trestles over Tumwater Creek would require soil disturbance in the eastern portions of the site, and therefore could impact contaminated sediments and groundwater.

Disturbance of contaminated sediments and/or groundwater could adversely affect the health and safety of workers, or could result in the migration of contaminants, or release of contaminants or contaminated sediments into the surface waters of Tumwater Creek, which could have flow-one effects on water quality and the biota of the stream and harbor, or could trigger a requirement for remediation with associated increase in risk of impacts due to the remedial investigation, and subsequent remediation, including potential treatment, excavation, storage, transportation, and disposal of hazardous wastes.

Several existing jetty piles and the associated wooden trestle would be removed from the nearshore area, which would disturb bottom sediments in the marine area. Similarly, the installation of new piles to allow extension of the existing terminal would also disturb bottom sediments in the nearshore. The potential contamination of marine sediments in the nearshore areas of the property is likely (WDOE, 2005b; Ecology & Environment, Inc., 2008), however the extent of contamination in the vicinity of the proposed disturbance is not known at this stage. Therefore, the effects of removal or installation of piles are speculative. If the marine sediments in the vicinity of proposed disturbance are contaminated, such disturbance could adversely affect the health and safety of workers, impact water quality within the harbor (with associated effects on marine biota), could result in the migration of contaminants, or could trigger a requirement for remediation with associated increase in risk of impacts due to the remedial investigation, and subsequent remediation, including potential treatment, excavation, storage, transportation, and disposal of hazardous wastes. Similarly, ongoing operation of the MOC-P homeport facility, once constructed, could impact these potentially contaminated marine sediments, e.g., through propeller wash stirring up the bottom sediments.

The proposed action at Site Alternative 2 would require demolition of the existing shop building and AST. There is potential for spills of hazardous materials if the AST is not properly closed, which includes the complete draining of the AST and all associated piping, decontamination of the AST and associated piping, subsequent confirmation soil sampling, and disposal of waste materials in accordance with relevant regulations. Similarly, there is potential for spills if the shop building is not completely emptied of all containers of hazardous materials prior to demolition and such containers are not disposed of in accordance with relevant regulations.

There is potential for ACM or lead-based paint to be present within the existing maintenance shop building. Demolition of buildings containing ACM or lead-based paint could impact worker health and safety, and the environment, if appropriate mitigation measures are not taken during demolition and during handling and disposal of such materials.

Once constructed and operational, the majority of the upland site would be paved and impervious. While hazardous materials would be stored and used on the site, there would be a dedicated building for hazardous material storage, which would be located at a distance from other structures on the site. Operation of the NOAA facility may include fueling of vessels moored at the site via fuel trucks driving on the wharf and piers, which poses a risk of accidental spills or leaks. In addition, if vessels mooring at the site require hazardous materials to be loaded or unloaded from the vessels, this would also pose a risk of accidental spills or leaks. Provided that the mitigation measures below are implemented appropriately, the use of hazardous materials at the site would have negligible adverse environmental impacts.

5.17.3.3 Mitigation Measures

The following mitigation measures are recommended in relation to hazardous materials and waste. It is assumed that no significant impacts would result provided that recommendations within a Phase I ESA accepted by NOAA are implemented; and that the following measures, or equivalent actions, are undertaken:

- Compliance with WDOE and federal RCRA hazardous waste generation and disposal, and hazardous materials use and storage notification requirements.
- Implementation of an appropriate soil/sediment handling and disposal approach if soil/sediment on the site is disturbed.
- Preparation of a hazardous materials closure plan, to address the storage of hazardous materials at the site, including the diesel AST, and approval of this plan by the WDOE. Implementation of this plan at this site would require, as a minimum, the following actions[1]:
    - Hazardous materials currently stored within the mechanical maintenance shop on site should be removed prior to demolition and transferred to another location.
    - Hazardous materials storage areas should be properly decontaminated.
    - The diesel AST should be appropriately closed, emptied, decontaminated and removed in accordance with local, state and federal regulations including Washington State code WAC 173303.
    - All closure and hazardous waste disposal activities must be performed in accordance with local, state and federal regulations, including Washington State code WAC 173303 and CFR Title 40, Volume 23.
- Compliance with 40 CFR Part 112, regulating petroleum-storage tanks and mandating preparation of a Spill Prevention, Control, and Countermeasures Plan (SPCC), may be required, depending on the quantity of fuel storage planned at the site (present

[1] For further details see Washington Department of Ecology's *Guidance for Closure of Dangerous Waste Units and Facilities* (WDOE, 2005a).

regulations require an SPCC Plan if greater than 1,320 gallons of petroleum products would be stored on site).

- Development of an appropriate hazardous materials storage and management plan, in compliance with WDOE Tier II Reporting (if quantities are above relevant thresholds), in relation to use and storage of hazardous materials on site, including materials related to vehicle fueling. This plan should be submitted to all appropriate agencies including the Clallam County Division of Emergency Management.

- Implementation of an asbestos demolition survey and abatement plan for the proposed building demolitions and proposed renovations of existing buildings. This plan should address, at a minimum, the following items:

    - Compliance with all applicable local, state, and federal regulations for demolition, abatement, and disposal;

    - Asbestos abatement measures, including use of licensed and trained asbestos abatement contractors and (if necessary) encapsulation strategies to protect public health,;

    - Air monitoring for worker and public safety;

    - Procedures to properly transportation and dispose potential ACM using licensed haulers and disposal facilities.

- Implementation of a lead-based paint demolition survey and abatement plan for the proposed building demolitions and proposed renovations of existing buildings. This plan should address, at a minimum, the following items:

    - Compliance with all applicable local, state, and federal regulations for demolition, abatement, and disposal;

    - Lead based paint abatement measures, including use of licensed and trained lead based paint abatement contractors;

    - Air monitoring for worker and public safety;

    - Procedures to properly transportation and dispose potential lead based paint containing materials using licensed haulers and disposal facilities.

It is expected that the lessor will satisfy appropriate mitigation measures by following the usual permitting and regulatory requirements.

5.17.4 Site Alternative 3: Bellingham

5.17.4.1 Existing Environment

The majority of the site is currently vacant and paved with asphalt, except for the Warehouse One and former maintenance shop buildings. In January 2009 the warehouse contained approximately 50 drums filled with investigation-derived waste from a recent sediment investigation for the Whatcom Waterway remedial design project (Aspect, 2009). The former maintenance shop contained a metal cabinet with flammable solvents and paints. There are no underground or aboveground storage tanks currently on the site.

As a result of a January 2009 Phase I ESA prepared for this site (Aspect, 2009), the following RECs were identified:

- Contamination from historic industrial activities on the former Georgia-Pacific Mill property to the northeast of the site has impacted upland soils and groundwater with a variety of constituents, including heavy metals (predominantly mercury) and petroleum hydrocarbons. Groundwater beneath the southern margin of the site contains mercury concentrations slightly above the State groundwater cleanup level.

- Contaminated sediments in the Outer Whatcom Waterway adjacent to the site.

- Based on Port records, some contaminated fill material may be present in the subsurface just north of Warehouse 2 (on port-owned land to the south of the site).

The Phase I ESA for this site did not contain all information customarily found using the ASTM standard (URS, 2009), and additional information has been requested by NOAA.

A hazardous building materials survey of the Warehouse One building has been undertaken, which indicated that several surfaces within the building contain lead-based paint, and that there is ACM within the warehouse building. A hazardous building materials survey was also undertaken for the “boat repair building” (assumed to be the former maintenance shop). This survey did not find any surfaces with lead-based paint or ACM. The surveys for both buildings mentioned the presence of fluorescent lighting fixtures that may potentially contain PCBs, and other lighting fixtures that may be of the mercury or sodium vapor variety (Aspect, 2009).

The Port of Bellingham is currently preparing to complete a Remedial Investigation/Feasibility Study for the Former Georgia-Pacific Mill Property under an Agreed Order with the WDOE, and

would subsequently proceed with contamination cleanup under a Consent Decree as warranted to support the future redevelopment of the Whatcom area (Aspect, 2009).

Dredging of contaminated sediments in the Outer Whatcom Waterway adjacent to the subject property is part of a proposed cleanup action to be completed under an existing Consent Decree. The planned cleanup would support continued maritime use of the waterway adjacent to the subject property.

5.17.4.2 Environmental Consequences

In a review of the Phase I ESA (URS, 2009), it was noted that there is a potential that historical activities on- and off-site may have resulted in contamination to site soil and groundwater, and to marine sediments considered to be within the site, as there were data gaps in the Phase I ESA. It is possible that implementation of a remedial investigation to further evaluate potential on-site contamination, including contamination of soil, groundwater and lakebed sediments could further define the presence of potential hazardous contamination at the site. It is assumed that any remedial investigation (and subsequent remediation, if necessary) would comply with all applicable local, state, and federal regulations, with regards to worker and public health and safety, waste management and treatment, excavation, transportation, and disposal of hazardous materials; and may require notification of applicable regulatory agencies.

Construction of upland elements of the proposed action would require foundations for the proposed new building. Disturbance of contaminated sediments and/or groundwater could adversely affect the health and safety of workers, or could result in the migration of contaminants.

The existing bulkhead sheet pile wall is to be removed and replaced, which would disturb bottom sediments in the marine area. Similarly, the removal of existing dolphins and installation of new piles would also disturb bottom sediments in the nearshore. There is known contamination of marine sediments within Whatcom Waterway (Aspect, 2009), therefore such disturbance could adversely affect the health and safety of workers, impact water quality within the harbor (with associated effects on marine biota), could result in the migration of contaminants, or could trigger a requirement for remediation with associated increase in risk of impacts due to the remedial investigation, and subsequent remediation, including potential treatment, excavation, storage, transportation, and disposal of hazardous wastes. Similarly, ongoing operation of the MOC-P homeport facility, once constructed, could impact these potentially contaminated marine sediments, e.g., through propeller wash stirring up the bottom sediments. Some remedial dredging of the waterway is part of a proposed cleanup action unrelated to this proposed action, and a study on the stability of proposed “capping” areas (e.g., from propeller wash) has been undertaken by the Port of Bellingham for the high level concept plan for their wider

redevelopment of the Port area (Stoner, 2009). A more detailed stability study is currently being undertaken in relation to the permit submittals for the redevelopment. If the capping areas are not sufficiently stable to prevent disturbance of contaminated marine sediments, this could have similar adverse effects to the installation and removal of piles.

The proposed action at Site Alternative 3 would require demolition of the existing Warehouse One and former maintenance shop buildings. There is a potential for spills of hazardous materials if the shop building is not completely emptied of all containers of hazardous materials prior to demolition and such containers are not disposed of in accordance with relevant regulations.

There is known ACM and lead-based paint within the existing Warehouse One building. Demolition of buildings containing ACM or lead-based paint could impact worker health and safety, and the environment, if appropriate mitigation measures are not taken during demolition and during handling and disposal of such materials. There may also be light fixtures containing PCBs and mercury or sodium vapor within both existing buildings on site. Such fixtures could impact worker health and safety, and the environment, if appropriate mitigation measures are not taken during demolition and during handling and disposal of such materials.

Once constructed and operational, the majority of the upland site would be paved and impervious. While hazardous materials would be stored and used on the site, there would be a dedicated building for hazardous material storage, which would be located at a distance from other structures on the site. Operation of the NOAA facility may include fueling of vessels moored at the site via fuel trucks driving on the wharf and piers, which poses a risk of accidental spills or leaks. In addition, if vessels mooring at the site require hazardous materials to be loaded or unloaded from the vessels, this would also pose a risk of accidental spills or leaks. Provided that the mitigation measures below are implemented appropriately, the use of hazardous materials at the site would have negligible adverse environmental impacts.

5.17.4.3 Mitigation Measures

The existing Phase I ESA (Aspect, 2009) did not contain all information customarily found under the ASTM standard (URS, 2009). It is assumed that no significant impacts would result provided that recommendations within a Phase I ESA accepted by NOAA are implemented; and that the following measures, or equivalent actions, are undertaken:

- Compliance with WDOE and federal RCRA hazardous waste generation and disposal, and hazardous materials use and storage notification requirements.

- Implementation of an appropriate soil/sediment handling and disposal approach if soil/sediment on the site is disturbed.

- Preparation of a hazardous materials closure plan to address the storage of hazardous materials at the site, and approval of this plan by WDOE. Implementation of this plan at this site would require, as a minimum, the following actions[2]:

    - Hazardous materials currently stored on site should be removed prior to demolition and transferred to another location.

    - Hazardous materials storage areas should be properly decontaminated.

    - All closure and hazardous waste disposal activities must be performed in accordance with local, state and federal regulations, including Washington State code WAC 173303 and CFR Title 40, Volume 23.

- Compliance with 40 CFR Part 112, regulating petroleum-storage tanks and mandating preparation of a SPCC Plan, may be required, depending on the quantity of fuel storage planned at the site (present regulations require an SPCC Plan if greater than 1,320 gallons of petroleum products would be stored on site).

- Development of an appropriate hazardous materials storage and management plan, in compliance with WDOE Tier II Reporting (if quantities are above relevant thresholds), in relation to use and storage of hazardous materials on site, including materials related to vehicle fueling. This plan should be submitted to all appropriate agencies including the Whatcom County Division of Emergency Management.

- Implementation of an asbestos demolition survey and abatement plan for the proposed building demolitions and proposed renovations of existing buildings. This plan should address, at a minimum, the following items:

    - Compliance with all applicable local, state, and federal regulations for demolition, abatement, and disposal;

    - Air monitoring for worker and public safety;

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[2] For further details see Washington Department of Ecology's *Guidance for Closure of Dangerous Waste Units and Facilities* (WDOE, 2005a).

- Asbestos abatement measures, including use of licensed and trained asbestos abatement contractors and (if necessary) encapsulation strategies to protect public health;
- Procedures to properly transportation and dispose potential ACM using licensed haulers and disposal facilities.

- Implementation of a lead-based paint demolition survey and abatement plan for the proposed building demolitions and proposed renovations of existing buildings. This plan should address, at a minimum, the following items:
  - Compliance with all applicable local, state, and federal regulations for demolition, abatement, and disposal;
  - Lead based paint abatement measures, including use of licensed and trained lead based paint abatement contractors;
  - Air monitoring for worker and public safety;
  - Procedures to properly transportation and dispose potential lead based paint containing materials using licensed haulers and disposal facilities.

It is expected that the lessor will satisfy appropriate mitigation measures by following the usual permitting and regulatory requirements.

5.17.5 Site Alternative 4: Newport

5.17.5.1 Existing Environment

The site is currently used by Yaquina Bay Fruit Processors and Carvahlo Fisheries for maraschino cherry processing and fish buying operations, respectively. Remnant ponds and other facilities from the former salmon farming operations are also still present on the site. Three ASTs are present on the property (Fernwood, 2009), two of which contain diesel and the other contains propane. A large generator is also present on the site, within the pumphouse. Sacks of food grade chemicals are stored on the site (for use in maraschino cherry processing).

As a result of the January 2009 Phase I ESA for this site (Fernwood, 2009) no potential or RECs were identified in connection with the site, and no further actions were recommended. It is noted that additional information has been requested by NOAA regarding the Phase I ESA for this site. It is unknown whether marine sediments in the nearshore areas of the site are potentially contaminated.

5.17.5.2 Environmental Consequences

In a review of the Phase I ESA (URS, 2009), it was noted that there is a potential that historical activities on- and off-site may have resulted in contamination to site soil and groundwater, and to marine sediments considered to be within the site. The Phase I ESA for this site did not contain all information customarily found using the ASTM standard (URS, 2009), and additional information has been requested by NOAA. It is possible that implementation of a remedial investigation to further evaluate potential on-site contamination, including contamination of soil, groundwater and lakebed sediments could further define the presence of potential hazardous contamination at the site. It is assumed that any remedial investigation (and subsequent remediation, if necessary) would comply with all applicable local, state, and federal regulations, with regards to worker and public health and safety, waste management and treatment, excavation, transportation, and disposal of hazardous materials; and may require notification of applicable regulatory agencies.

Construction of the proposed upland elements would require major earthworks to level the site, and create foundations for the proposed new buildings. All of these activities would disturb the soil. There is potential for such activities to impact contaminated sediments and groundwater, if such contamination exists. The likelihood of contaminated sediments at the site is considered low; however, there is potential for unknown contamination to be present. Disturbance of contaminated sediments and/or groundwater could adversely affect the health and safety of workers, result in the migration of contaminants, or trigger a requirement for remediation with associated increase in risk of impacts due to the remedial investigation, and subsequent remediation, including treatment, excavation, storage, transportation, and disposal of hazardous wastes.

The piles of the two existing docks are to be removed from the nearshore area, and dredging of the nearshore area would also be undertaken to create appropriate water depths for operation of the proposed action. Both of these activities would disturb bottom sediments in the marine area. Similarly, the installation of new piles for the proposed new pier would also disturb bottom sediments in the nearshore. The possibility of contamination of marine sediments in the nearshore areas of the property is unknown at this stage; therefore, the effects of removal or installation of piles are speculative. If marine sediments are contaminated, such disturbance could adversely affect the health and safety of workers, impact water quality within the harbor (with associated effects on marine biota), could result in the migration of contaminants, or could trigger a requirement for remediation with associated increase in risk of impacts due to the remedial investigation, and subsequent remediation, including potential treatment, excavation, storage, transportation, and disposal of hazardous wastes. Similarly, ongoing operation of the

MOC-P homeport facility, once constructed, could impact these potentially contaminated marine sediments, e.g., through propeller wash stirring up the bottom sediments.

The proposed action at Site Alternative 4 would require demolition of the existing structures on the site, removal of the diesel generator from within the pumphouse (for reuse as an emergency generator for the proposed action), and removal of the three ASTs. There is potential for spills of hazardous materials if the generator, fuel pipes, and ASTs are not completely emptied and decontaminated prior to removal and waste materials including oil are not disposed of in accordance with relevant regulations. Similarly, there is potential for spills if any existing containers of hazardous materials on site are not removed and/or disposed of in accordance with relevant regulations, prior to demolition.

There is potential for ACM or lead-based paint to be present within the existing pumphouse building. Demolition of buildings containing ACM or lead-based paint could impact worker health and safety, and the environment, if appropriate mitigation measures are not taken during demolition and during handling and disposal of such materials.

Once constructed and operational, the majority of the upland site would be paved and impervious. While hazardous materials would be stored and used on the site, there is a dedicated building for hazardous material storage, which would be located at a distance from other structures on the site. Operation of the proposed NOAA facility may include fueling of vessels moored at the site via fuel trucks driving on the wharf and piers, which poses a risk of accidental spills or leaks. In addition, if vessels mooring at the site require hazardous materials to be loaded or unloaded from the vessels, this also poses risk of accidental spills or leaks. Provided that the mitigation measures below are implemented appropriately, the use of hazardous materials at the site would have negligible adverse environmental impacts.

5.17.5.3 Mitigation Measures

The existing Phase I ESA (Fernwood, 2009) did not contain all information customarily found in a Phase I ESA under the ASTM standard (URS, 2009). It is assumed that no significant impacts would result provided that recommendations within a Phase I ESA accepted by NOAA are implemented; and that the following measures, or equivalent actions, are undertaken:

- Compliance with ODEQ and federal RCRA hazardous waste generation and disposal, and hazardous materials use and storage notification requirements.
- Implementation of an appropriate soil/sediment handling and disposal approach if soil/sediment on the site is disturbed.
- Emptying, cleaning and removal of ASTs, in accordance with proper standards of care.

- Compliance with local, state and federal regulations and proper standards of care during removal of any hazardous materials prior to demolition, transfer of such materials to another location, and/or disposal of such materials.

- Disconnection and removal of the diesel generator in accordance with proper standards of care, to minimize the risk of diesel spills or other releases.

- Compliance with 40 CFR Part 112, regulating petroleum-storage tanks and mandating preparation of a SPCC, may be required, depending on the quantity of fuel storage planned at the site (present regulations require an SPCC Plan if greater than 1,320 gallons of petroleum products would be stored on site).

- Development of an appropriate hazardous materials business plan in compliance with local and state requirements including the State of Oregon Department of the Fire Marshall Tier II Reporting *Hazardous Substance Inventory Survey*, in relation to use and storage of hazardous materials on site, and fueling of vessels, if quantities exceed relevant thresholds. Depending on quantities of materials stored and wastes generated, this alternative may also be subject to the requirements of the Oregon *Toxics Use and Hazardous Waste Reduction Act.*

- Implementation of an asbestos demolition survey and abatement plan for the proposed building demolitions and proposed renovations of existing buildings. This plan should address, at a minimum, the following items:

    - Compliance with all applicable local, state, and federal regulations for demolition, abatement, and disposal;

    - Asbestos abatement measures, including use of licensed and trained asbestos abatement contractors and (if necessary) encapsulation strategies to protect public health;

    - Air monitoring for worker and public safety;

    - Procedures to properly transportation and dispose potential ACM using licensed haulers and disposal facilities.

- Implementation of a lead-based paint demolition survey and abatement plan for the proposed building demolitions and proposed renovations of existing buildings. This plan should address, at a minimum, the following items:

- Compliance with all applicable local, state, and federal regulations for demolition, abatement, and disposal;
- Lead based paint abatement measures, including use of licensed and trained lead based paint abatement contractors;
- Air monitoring for worker and public safety;
- Procedures to properly transportation and dispose potential lead based paint containing materials using licensed haulers and disposal facilities.

It is expected that the lessor will satisfy appropriate mitigation measures by following the usual permitting and regulatory requirements.

5.18 SOCIO-ECONOMICS

This section examines potential effects of the proposed action on low-income and minority populations, employment, housing, public services and other factors at each Site Alternative. It assesses whether the proposed NOAA action is consistent with EO 12898: *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* by evaluating whether disadvantaged groups will directly experience a disproportionate share of any significant, adverse effects associated with this proposed action. Using Department of Commerce census data, potentially affected minority and low-income populations at or near the project areas are identified.

Distinct cultural, social, economic, or occupational conditions or regional plans that could alter the effects of the proposed action are also considered. Likewise, community impacts are analyzed to assess the relative effects on local housing and employment. If adverse effects to disproportionately high populations of minority or low-income populations would occur, mitigation measures will be recommended.

Readily available data have been used that may not accurately reflect regional unemployment, median housing prices or poverty status as of the month of final preparation for this report (June 2009). It is assumed that the unprecedented nationwide recession is affecting all regions and socioeconomic groups equally.

5.18.1 No-Action Alternative

5.18.1.1 Affected Environment

The No-Action Alternative assumes continuation of upland activities at the existing MOC-P site on Lake Union, and continuation of water-based activities (ship berthing, etc) at various

temporary locations around Lake Union and the Seattle area, as described in Section 4.3 above. The socio-economic environment of the Lake Union area is described more fully in Section 5.18.2.1 below.

5.18.1.2 Environmental Consequences

The No-Action Alternative assumes that no substantive change to existing conditions would result, and capital improvements or related MOC-P investments would not occur. Hence, no infusion of funding for construction or renovation of upland or in-water structures would occur within the local economy. Long-term investment of continued operations and maintenance, following lapse of the existing NOAA lease of its existing MOC-P facilities at Lake Union, may not occur. Existing budgets or nominal increases would be directed to existing facilities or to unknown locations providing temporary future berths for NOAA vessels.

Under the No-Action Alternative, should MOC-P not extend its lease of the Lake Union property, redevelopment of the site for other water-dependent uses would likely occur. Such prospective uses include recreational moorings with retail development, expansion of adjacent drydock and top-side ship repair operations, or development of a houseboat community, among others.

Not implementing the proposed action under the No-Action Alternative would represent a temporary minor, adverse impact. Use of only administrative and warehouse functions at the MOC-P facilities on Lake Union would not represent the property's highest and best use and obviate its potential for more substantial development during the existing lease, or any future extension of the lease at this location. Long-term economic effects would be moderate considering the lack of a central MOC-P headquarters for its entire staff, contractors, and interrelated functions. These effects would occur in the form of cost inefficiencies related to vessel berthing, operations and maintenance, officer and staff travel, and support for NOAA programs, among others.

5.18.1.3 Mitigation Measures

Implementation of the No-Action Alternative would result in moderate adverse effects. No mitigation measures are recommended under the No-Action Alternative.

5.18.2 Site Alternative 1: Lake Union

5.18.2.1 Affected Environment

The proposed action under Site Alternative 1 would occur within the city of Seattle, King County, Washington, along the southeast shore of Lake Union. King County is often considered

the financial and population center of the Pacific Northwest, with several Fortune 500 companies headquartered in the region. Since MOC-P was first established at the subject site in 1963, the community has transformed from a primarily marine industrial zone to a mixed use area, with residential, commercial and industrial properties currently represented within one-quarter mile of the site boundary.

As shown in **Table 5.18-1** below, the population of the City of Seattle was 565,809 in 2007, with an annual growth rate of 0.6 percent over the last 17 years. In comparison, the state of Washington and King County had populations increasing at annual growth rates of 1.8 percent and 1.3 percent, respectively. The site is located centrally within Census Tract #66 King County, Washington. A map showing the approximate boundary of this alternative within the census tract is provided in **Appendix F-1**. While 2009 data for Census Tract #66 are unavailable, between 1990 and 2000 this Census Tract had an annual growth rate of 0.9 percent.

Statewide approximately 20 percent of the population is defined as a minority population, with a greater percentage residing within King County (26.8 percent) and the city of Seattle (29.5 percent) as of 2007. For Census Tract #66, the percentage of people having minority status in 2000 was 14.6 percent.

Table 5.18-1: Population and Minority Status

	1990		2000		2007	
Location	**Population**	**Percent**	**Population**	**Percent**	**Population**	**Percent**
Washington State	**4,866,692**	**100.0%**	**5,894,121**	**100.0%**	**6,371,390**	**100.0%**
White	4,308,937	88.5%	4,821,823	81.8%	5,143,628	80.7%
Minority	557,755	11.5%	1,072,298	18.2%	1,227,762	19.3%
King County	**1,507,319**	**100.0%**	**1,737,034**	**100.0%**	**1,832,835**	**100.0%**
White	1,278,532	84.8%	1,315,507	75.7%	1,341,611	73.2%
Minority	228,787	15.2%	421,527	24.3%	491,224	26.8%
City of Seattle	**516,259**	**100.0%**	**563,374**	**100.0%**	**565,809**	**100.0%**
White	388,858	75.3%	394,889	70.1%	398,994	70.5%
Minority	127,401	24.7%	168,485	29.9%	166,815	29.5%
Census Tract #66	**2,707**	**100.0%**	**2,954**	**100.0%**	**NA**	**NA**
White	2,465	91.1%	2,524	85.4%	NA	NA
Minority	242	8.9%	430	14.6%	NA	NA

Source: U.S. Census Bureau, 2009

The annual population growth rate for the State is projected to slow to 1.5 percent by 2030 while the county's growth rate is projected to slow to 1.0 percent. Even though the state's population rate is projected to be higher than that of King County, the growth within King County is still estimated to consume approximately 20 percent of the statewide growth, or 2,262,977 people by 2030, as shown in **Table 5.18-2** below.

Table 5.18-2: Population Projection

Location	2007 Population	2020 Population	2030 Population
State of Washington	6,371,390	7,698,939	8,509,161
King County	1,832,835	2,114,415	2,262,977

Source: State of Washington Office of Financial Management, 2007

The percentage of the population living in poverty is determined from the number of individuals or families earning less than a certain amount of annual income. Each year the U.S. Census Bureau adjusts this amount based on inflation and other factors (U.S. Census Bureau, 2008). The following values represent the poverty thresholds for a family of four with two dependents for the census years since 1990:

- 1990 - $13,254
- 2000 - $17,463
- 2007 - $21,027

Table 5.18-3 below shows that statewide, the percentage of people living in poverty has slowly increased, including within King County and the city of Seattle. Conversely, from 1990 to 2000, Census Tract #66 has experienced a decrease in the number of people living in poverty, from 240 to 194. While this trend may have changed in the past seven years, historically the percentage of people living in poverty within this Census Tract has been less than the corresponding percentages for the City, County and State.

Table 5.18-3: Poverty Status

Location	1990 Population	2000 Population	2007 Population
Washington State			
Number below Poverty Line	517,933	612,370	751,824
Percent of total population	10.9%	10.6%	11.8%
King County			
Number below Poverty Line	117,589	142,546	179,618
Percent of total population	8.0%	8.4%	9.8%
City of Seattle			
Number below Poverty Line	61,681	64,068	73,555
Percent of total population	12.4%	11.8%	13.0%
Census Tract #66			
Number below Poverty Line	240	194	NA
Percent of total population	8.9%	6.8%	NA

Source: U.S. Census Bureau, 2009

The unemployment rate in the state of Washington was 6.5 percent in 2007, and has steadily increased since 1990 (see **Table 5.18-4** below**)**. The unemployment rate within King County and the city of Seattle are below those of the state, at 5.3 percent and 5.9 percent respectively. The unemployment rate for Census Tract #66 was 3.0 percent in 2000. Additionally, 80 percent of the population within the Census Tract is classified as "workers," compared to 60 percent within

the City of Seattle. A "worker" is defined as an individual who is either currently employed or who is actively seeking employment.

Table 5.18-4: Number of Workers and Unemployment Rate

Location	1990 Population	2000 Population	2007 Population
Washington State			
Number of Workers	2,487,073	3,027,734	3,312,856
Unemployment Rate	5.6%	6.1%	6.5%
King County			
Number of Workers	856,667	974,767	1,032,018
Unemployment Rate	4.1%	4.5%	5.3%
City of Seattle			
Number of Workers	300,314	339,956	344,042
Unemployment Rate	4.9%	5.1%	5.9%
Census Tract #66			
Number of Workers	2,161	2,366	NA
Unemployment Rate	4.2%	3.0%	NA

Source: U.S. Census Bureau, 2009

Three professions that MOC-P would typically need and could be impacted locally by the proposed action are Captains, Mates and Pilots of Water Vessels, Sailors and Marine Oilers, and Ship Engineers. Figures regarding these occupations are not available at a local level, however, Metropolitan Statistical Areas (MSAs) provide a geographical unit from which to analyze local or regional employment within these occupations. Of all state of Washington MSAs, the Seattle MSA has the largest number of marine related industries. As of 2006 there were 1,489 Captains, 1,886 Sailors and 981 Engineers in the State of Washington. The Seattle MSA comprises 1,027 Captains, 1,133 Sailors and 821 Engineers (State of Washington Employment Security Department, 2008)

In response to an increase in the population of King County, housing stock has also increased steadily since 1990. A majority of the housing units built throughout the state in the past 17 years have been single family homes, with fewer increases in multifamily dwellings and almost stagnant growth in mobile homes (see **Table 5.18-5** below). In higher density urban areas such as the city of Seattle, the number of single family homes and multifamily dwellings are nearly identical, where statewide almost two thirds of the homes are single family dwellings. Census Tract #66 is densely urbanized with approximately 78% of the residences classified as multifamily units.

As of 2006 (the most current available full-year data), the median price of a single-family home in King County was $425,000, representing a 70 percent increase from the median 2000 price of $249,900 (Washington State University Center for Real Estate Research, 2009). While house prices are likely to have fallen during the recent economic downturn, the overall increase in

housing prices has far outpaced the increases in annual income during a similar period (a 22.1 percent increase in median household income from 2000 to 2007 [U.S. Census Bureau, 2009]).

Table 5.18-5: Housing by Type

Housing Type	1990	2000	2007
Washington State			
Single Family	1,320,807	1,603,674	1,788,563
Multifamily	504,374	626,917	697,581
Mobile Home or Other	207,197	220,484	212,786
King County			
Single Family	393,600	447,166	489,897
Multifamily	228,602	274,994	296,960
Mobile Home or Other	25,141	20,077	17,915
City of Seattle			
Single Family	132,330	138,827	144,918
Multifamily	113,146	130,348	135,842
Mobile Home or Other	3,556	1,361	908
Census Tract #66			
Single Family	294	347	NA
Multifamily	1,356	1,497	NA
Mobile Home or Other	119	85	NA

Source: U.S. Census Bureau, 2009

Within King County there are a large number of school districts, with the largest being the Seattle Public Schools District. Since 2004 the annual fluctuation of students has been several hundred students with the high being 46,331 in 2004 and a low in 2007 of 45,581 students, representing a maximum change of 750 students (see **Table 5.18-6** below). Currently the surrounding school districts already serve the children of the employees of the NOAA facility.

Table 5.18-6: Annual Number of Students

District	2004	2005	2006	2007
Seattle Public Schools	46,331	46,070	46,097	45,581

Source: State of Washington Office of Superintendent of Education, 2008.

5.18.2.2 Environmental Consequences

The rebuilding of piers and docks and the renovation or replacement of upland structures at this location is expected to provide economic opportunities given the limited availability of shoreline properties as an economic resource. Short-term economic effects would be positive as a result of redevelopment and enhancement of the shoreline with piers and upland facilities. Long-term impacts are considered to be minimal given the size and diversity of economic activity within this community and Census Tract.

Considering the past use of the subject site by NOAA, impacts on the local population would be negligible. The proposed action at this alternative would not substantially alter the size or

composition of the local population. Individuals currently working at the subject site would remain or be replaced by a similar number of staff or contractors.

The percentage of minority populations within Census Tract #66 is below that of the surrounding jurisdictions. Hence, minority populations would not be disproportionately exposed to any adverse human health or environmental effects.

It is estimated that the percentage of people living in poverty within Census Tract #66 is less that that for the city and/or county, as a whole. Hence, no low-income populations would be exposed to disproportionately high adverse human health or environmental effects.

Project-related effects on employment and individuals living in poverty would be minor. Short-term economic stimulus would occur due to contracts to renovate the property and rebuild piers or other in-water infrastructure. This effect would be minor and temporary. Long-term socioeconomic effects would be minor, primarily due to the existence of similar MOC-P operations at Site Alternative 1 since the 1960s.

With the large number of people in King County already employed in the maritime industry, the impacts of this facility would be negligible. The number of people needed to operate the facility is small in comparison to the number of people in the maritime industry leading to no significant increases in costs of service because of supply and demand shifts.

There are numerous housing opportunities in the community and for the city of Seattle overall. Under Site Alternative 1, few additional project-related NOAA staff, crew or contract support personnel would be seeking housing. The proposed action would have little impact on local housing stock and median home prices.

The economic impacts to education for the proposed action would be negligible. With the MOC--P currently and historically located in the area, the regional school districts are able to serve NOAA employees and contractors. Further the number of students created by the MOC-P is well below the absolute number of past fluctuations in student populations within surrounding school districts.

Overall, the proposed action at Site Alternative 1 would have a negligible socioeconomic effect. No minority or low-income populations would be disproportionately affected by implementation of the proposed action under Site Alternative 1.

5.18.2.3 Mitigation Measures

No mitigation measures are recommended in relation to socioeconomic impacts for the proposed action at Site Alternative 1.

5.18.3 Site Alternative 2: Port Angeles

5.18.3.1 Affected Environment

The proposed action under Site Alternative 2 would occur within the city of Port Angeles, Clallam County, on the Olympic Peninsula within the state of Washington. Port Angeles is the county seat as well as the largest city in the county. Major industries within Clallam County include commercial logging and fishing; however in recent years these industries have been in decline (BST Associates, 2008). Many tourists are attracted to the area due to its close proximity to the Olympic Mountain Range and associated national park, wilderness area and adjacent marine sanctuary, among other cultural and natural attractions.

As shown in **Table 5.18-7** below, the population of the city of Port Angeles in 2000 was 18,397 and the annual growth rate was 0.4 percent between 1990 and 2000. In comparison, the State of Washington and Clallam County have populations increasing at annual growth rates of 1.8 percent and 1.4 percent, respectively. Site Alternative 2 is not centrally located within a Census Tract; therefore adjacent tracts are examined as a representation of the surrounding area. The site is located within Census Tract #9807 Clallam County, Washington, and near Census Tracts #9808 and #9809. Between 1990 and 2000 these Census Tracts had a combined annual growth rate of 0.0 percent. A map showing the approximate boundary of this alternative within the census tracts is provided in **Appendix F-2**.

Table 5.18-7: Population and Minority Status

	1990		2000		2007	
Location	**Population**	**Percent**	**Population**	**Percent**	**Population**	**Percent**
Washington State	**4,866,692**	**100.0%**	**5,894,121**	**100.0%**	**6,371,390**	**100.0%**
White	4,308,937	88.5%	4,821,823	81.8%	5,143,628	80.7%
Minority	557,755	11.5%	1,072,298	18.2%	1,227,762	19.3%
Clallam County	**56,464**	**100.0%**	**64,525**	**100.0%**	**69,670**	**100.0%**
White	52,509	93.0%	57,505	89.1%	61,597	88.4%
Minority	3,955	7.0%	7,020	10.9%	8,073	11.6%
City of Port Angeles	**17,710**	**100.0%**	**18,397**	**100.0%**	**NA**	**NA**
White	16,880	95.3%	16,806	91.4%	NA	NA
Minority	830	4.7%	1,591	8.6%	NA	NA
Census Tract #9807	**3,631**	**100.0%**	**3,137**	**100.0%**	**NA**	**NA**
White	3,506	96.6%	2,871	91.5%	NA	NA
Minority	125	3.4%	266	8.5%	NA	NA
Census Tract #9808	**3,866**	**100.0%**	**4,058**	**100.0%**	**NA**	**NA**
White	3,665	94.8%	3,680	90.7%	NA	NA
Minority	201	5.2%	378	9.3%	NA	NA
Census Tract #9809	**2,564**	**100.0%**	**2,890**	**100.0%**	**NA**	**NA**
White	2,441	95.2%	2,673	92.5%	NA	NA
Minority	123	4.8%	217	7.5%	NA	NA

Source: U.S. Census Bureau, 2009

Statewide approximately 20 percent of the population is defined as a minority population, with a smaller percentage residing within Clallam County (11.6 percent) in 2007 and the city of Port Angeles (8.6 percent) as of 2000. For the Census Tracts, the percentage of people with minority status in 2000 ranged from 7.5 percent to 9.3 percent.

The annual population rate for the state of Washington is projected to decrease to 1.5 percent by 2030, while population growth for Clallam County is projected to slow to an annual growth rate of 0.8 percent (refer **Table 5.18.8**). Clallam County is expected to continue to grow at a slower rate than that of the state until 2030, at which time it will contain less than one percent of the state's total population.

Table 5.18-8: Population Projections

Location	2007	2020	2030
State of Washington	6,371,390	7,698,939	8,509,161
Clallam County	69,670	75,485	81,852

Source: State of Washington Office of Financial Management, 2007

The percent of the population living in poverty is determined from the number of individuals or families earning less than a certain amount of annual income. Each year the U.S. Census Bureau adjusts this amount based on inflation and other factors (U.S. Census Bureau, 2008). The following values represent the poverty threshold of a family of four with two dependents:

- 1990 - $13,254
- 2000 - $17,463
- 2007 - $21,027

Statewide the percentage of people living in poverty has slowly increased over recent years (see **Table 5.18-9** below). Clallam County has followed a similar track, increasing from 12.5 percent to 13.2 percent between 1990 and 2007. Conversely, from 1990 to 2000, the number of people in poverty in Port Angeles slightly decreased by a total of four individuals to a total of 13.2 percent. The census tract data reveals a mix of trends, with Census Tracts #9807 and #9809 both increasing in the number living in poverty while Census Tract #9808 decreased in the number living in poverty. Combined, the three census tracts had 11.6 percent of the population living in poverty in 2000.

Table 5.18-9: Poverty Status

Location	1990	2000	2007
Washington State			
Number below Poverty Line	517,933	612,370	751,824
Percent of total population	10.9%	10.6%	11.8%
Clallam County			
Number below Poverty Line	6,852	7,825	9,196
Percent of total population	12.5%	12.5%	13.2%

Location	1990	2000	2007
City of Port Angeles			
Number below Poverty Line	2,395	2,391	NA
Percent of total population	13.9%	13.2%	NA
Census Tract #9807			
Number below Poverty Line	189	316	NA
Percent of total population	5.2%	10.3%	NA
Census Tract #9808			
Number below Poverty Line	569	458	NA
Percent of total population	14.8%	11.4%	NA
Census Tract #9809			
Number below Poverty Line	352	398	NA
Percent of total population	14.0%	13.7%	NA

Source: U.S. Census Bureau, 2009

The unemployment rate in the state of Washington was 6.5 percent in 2007, and has steadily increased since 1990 (see **Table 5.18-10** below). The unemployment rate within Clallam County was below that of the State in 2007, with an unemployment rate of 5.7 percent. Conversely the city of Port Angeles' 2000 unemployment rate (6.1 percent) was above that of the State (8.0 percent). The unemployment rates for the affected Census Tracts analyzed are disparate. Census tracts #9807 and #9809 had relatively higher unemployment and Census Tract #9808 had relatively lower unemployment. Combined, the unemployment rate in these Census Tracts was 8.7%, slightly above the City's unemployment rate.

Table 5.18-10: Number of Workers and Unemployment Rate

Location	1990	2000	2007
Washington State			
Number of Workers	2,487,073	3,027,734	3,312,856
Unemployment Rate	5.6%	6.1%	6.5%
Clallam County			
Number of Workers	22,942	26,738	30,244
Unemployment Rate	7.9%	7.6%	5.7%
City of Port Angeles			
Number of Workers	7,920	8,443	NA
Unemployment Rate	7.5%	8.0%	NA
Census Tract #9807			
Number of Workers	1,542	1,535	NA
Unemployment Rate	6.2%	9.7%	NA
Census Tract #9808			
Number of Workers	1,807	1,898	NA
Unemployment Rate	6.5%	6.2%	NA
Census Tract #9809			
Number of Workers	1,158	1,318	NA
Unemployment Rate	8.1%	11.3%	NA

Source: U.S. Census Bureau, 2009

Three professions that MOC-P would typically need and could be impacted locally by the proposed action are Captains, Mates and Pilots of Water Vessels, Sailors and Marine Oilers, and

Ship Engineers. Figures regarding these occupations are not available at a local level, however, MSAs provide a geographical unit from which to analyze local or regional employment within these occupations. The Olympic MSA, which includes Clallam County, has a small population of people trained in marine related industries. As of 2006 there were 1,489 Captains, 1,886 Sailors and 981 Engineers in the State of Washington. The Olympic MSA comprises 88 Captains, 177 Sailors and zero Engineers (State of Washington Employment Security Department, 2008).

Due to the rapid increase of population in the State, the housing stock has seen large increases as well. A majority of the housing units built in the past 17 years have been single family homes with fewer increases in multifamily dwellings and almost stagnant growth in mobile homes, as shown in **Table 5-18.11** below. Normally in higher density urban areas where space is limited, fewer single family homes are built and more multifamily dwellings are constructed. Clallam County and the City of Port Angeles are not highly urbanized areas and as a result, the percentages of single family homes make up a higher percentage of the housing stock than the state average. This is evident when looking at the number of houses by type in Port Angeles, with 75 percent of the housing stock being single family residences. Combined, the local census tracts have the same percentage of single family residences (75 percent).

Table 5.18-11: Housing by Type

Housing Type	1990	2000	2007
Washington State			
Single Family	1,320,807	1,603,674	1,788,563
Multifamily	504,374	626,917	697,581
Mobile Home or Other	207,197	220,484	212,786
Clallam County			
Single Family	17,479	21,765	24,202
Multifamily	2,727	3,500	3,715
Mobile Home or Other	5,019	5,418	5,456
City of Port Angeles			
Single Family	6,005	6,463	NA
Multifamily	1,566	2,016	NA
Mobile Home or Other	262	250	NA
Census Tract #9807			
Single Family	1,333	1,003	NA
Multifamily	156	131	NA
Mobile Home or Other	99	122	NA
Census Tract #9808			
Single Family	1,226	1,416	NA
Multifamily	411	369	NA
Mobile Home or Other	67	115	NA
Census Tract #9809			
Single Family	886	1,102	NA
Multifamily	332	422	NA
Mobile Home or Other	14	0	NA

Source: U.S. Census Bureau, 2009

As of 2006 (the most current available full-year data), the median home price within Clallam County was $231,500; a dramatic increase of 96.5 percent from the 2000 median price of $117,800 (Washington State University Center for Real Estate Research, 2009). While house prices are likely to have fallen during the recent economic downturn, the overall increase in housing costs has far outpaced the increases in annual income during a similar period (a 14.7 percent increase in median household income from 2000 to 2007 (U.S. Census Bureau, 2009)).

Within Clallam County there are several school districts with the largest being the Port Angeles school district. Since 2004 the number of students in the Port Angeles School District has decreased each year, as shown in **Table 5.18-12** below. In 2004 the student population was 4,878, while in 2007 there were 4,389 students. This represents a steady reduction over four years totaling 428 students.

Table 5.18-12: Annual Number of Students

District	2004	2005	2006	2007
Port Angeles	4,878	4,631	4,519	4,389

Source: State of Washington Office of Superintendent of Education, 2008.

5.18.3.2 Environmental Consequences

The proposed action at Site Alternative 2 is expected to result in economic opportunities for the local community. Short-term economic effects would occur as a result of redevelopment of the shoreline with piers and upland facilities. Long-term impacts are also considered to be positive given the infusion of economic activity in the form of local housing and other accommodations, increased patronage for local retail and various public and private services.

The proposed action would result in a slight increase in the local population. Some current MOC-P employees may relocate, while remaining positions may be filled through the federal hiring process, potentially resulting in some local hiring, as well as contracted services. Some existing staff would not relocate and may decide to retire or take other positions, in some cases severing a long-time association as a NOAA employee in support of MOC-P. Some quality-of-life changes for some employees may result from a MOC-P relocation from the Seattle metropolitan area.

The percentage of minority populations within Census Tract #9807 and the adjoining Tracts of #9808 and #9809 are similar to the city and county and well below those of the state. Hence, minority populations would not be disproportionately affected by adverse human health or environmental effects.

Currently there are few individuals living in poverty within the affected Census Tracts; the area traditionally has few people that meet this definition. Disadvantaged populations would not experience adverse impacts due to the proposed action for Site Alternative 2.

Minor, short-term increases in employment may occur due to the proposed construction and development of docks and upland facilities. Few workers in the maritime industry currently residing in Clallam County are expected to meet the employment or wage mariner contractor requirements required of NMAO and MOC-P, which may result in skilled workers moving to the area to fill such positions. However, as the total number of such migrant workers would be small in relation to the community as a whole, the long-term effect on employment would be negligible. Overall, the impacts of the proposed action at Site Alternative 2 on employment would be positive.

The local real estate market would not be adversely affected by the relocation of MOC-P. The local market is dominated by single family homes, providing fewer options for single-occupant dwellings compared to more metropolitan areas. However, the cost of housing is relatively lower than state or national averages. The effect upon local housing stock or the cost of housing would be positive, albeit minor. Likewise, the effect of the project on educational opportunities would be negligible. The number of new students associated with the proposed action would be substantially less than the annual fluctuation of the local student population.

Overall, the proposed action at Site Alternative 2 would have a negligible socioeconomic effect. No minority or low-income populations would be disproportionately affected by the proposed action at Site Alternative 2.

5.18.3.3 Mitigation Measures

No mitigation measures are recommended in relation to socioeconomic impacts for the proposed action at Site Alternative 2.

5.18.4 Site Alternative 3: Bellingham

5.18.4.1 Affected Environment

The proposed action under Site Alternative 3 would occur within the city of Bellingham, Whatcom County, located in northwestern Washington. Currently Bellingham is the county seat and the largest city in the county. Key industries within Whatcom County traditionally include logging, mining and fishing; however there has been a large shift in the economy resulting in more production, retail and government jobs which are now the dominant industry sectors (BST Associates, 2008) The proposed location is south of the original downtown and is surrounded by other piers and their support services.

As shown in **Table 5.18-13** below, the population of the city of Bellingham was 75,418 in 2007, with an annual growth rate of 2.6 percent between 1990 and 2007. In comparison, the state of Washington and Whatcom County had populations that increased at annual growth rates of 1.8

percent and 2.8 percent, respectively. Site Alternative 3 is located within Census Tract #6 Whatcom County, Washington, but is near the boundary; therefore Census Tracts #10 and #11 will also be used to represent the surrounding community for Site Alternative 3. Between 1990 and 2000 these three Census Tracts had a combined annual growth rate of 1.3 percent. A map showing the approximate boundary of the Site Alternative within the census tracts is provided in **Appendix F-3**.

Statewide, approximately 20 percent of the population is defined as a minority population, with a smaller percentage residing within both Whatcom County (11.6 percent) and Bellingham (13.0 percent). For the Census Tracts, the percentage of people with minority status in 2000 ranged from 5.7 percent to 18.8 percent.

Table 5.18-13: Population and Minority Status

	1990		2000		2007	
Location	**Population**	**Percent**	**Population**	**Percent**	**Population**	**Percent**
Washington State	**4,866,692**	**100.0%**	**5,894,121**	**100.0%**	**6,371,390**	**100.0%**
White	4,308,937	88.5%	4,821,823	81.8%	5,143,628	80.7%
Minority	557,755	11.5%	1,072,298	18.2%	1,227,762	19.3%
Whatcom County	**127,780**	**100.0%**	**166,814**	**100.0%**	**189,110**	**100.0%**
White	119,229	93.3%	147,485	88.4%	167,098	88.4%
Minority	8,551	6.7%	19,329	11.6%	22,012	11.6%
City of Bellingham	**52,179**	**100.0%**	**67,171**	**100.0%**	**75,418**	**100.0%**
White	48,923	93.8%	59,031	87.9%	65,640	87.0%
Minority	3,256	6.2%	8,140	12.1%	9,778	13.0%
Census Tract #6	**568**	**100.0%**	**754**	**100.0%**	**NA**	**NA**
White	491	86.4%	612	81.2%	NA	NA
Minority	77	13.6%	142	18.8%	NA	NA
Census Tract #10	**5,941**	**100.0%**	**6,918**	**100.0%**	**NA**	**NA**
White	5,328	89.7%	5,897	85.2%	NA	NA
Minority	613	10.3%	1,021	14.8%	NA	NA
Census Tract #11	**5,900**	**100.0%**	**6,319**	**100.0%**	**NA**	**NA**
White	5,702	96.6%	5,958	94.3%	NA	NA
Minority	198	3.4%	361	5.7%	NA	NA

Source: U.S. Census Bureau, 2009

The annual population rate for the State is projected to decrease to 1.5 percent while the growth rate of Whatcom County is projected to decrease to 1.7 percent. Whatcom County is expected to continue to grow at a faster rate than that of the state up to 2030 when it will contain approximately three percent of the state's total population (see **Table 5.18-14** below).

Table 5.18-14: Population Projections

Location	2007	2020	2030
State of Washington	6,371,390	7,698,939	8,509,161
Whatcom County	189,110	230,008	261,416

Source: State of Washington Office of Financial Management, 2007

The percentage of the population living in poverty is determined from the number of individuals or families earning less than a certain amount of annual income. Each year the U.S. Census Bureau adjusts this amount based on inflation and other factors (U.S. Census Bureau, 2008). The following values represent the poverty threshold for a family of four with two dependents:

- 1990 - $13,254
- 2000 - $17,463
- 2007 - $21,027

As shown in **Table 5.18-15** below, the percentage of people living in poverty statewide has slowly increased, with a similar trend for Whatcom County. Combined, the Census Tract data shows 19.8% of the population living in poverty; however the poverty status figures varied significantly between individual Census Tracts, ranging from 11.9 percent in Census Tract #11 to 52.0 percent in Census Tract #10.

Table 5.18-15: Poverty Status

Location	1990	2000	2007
Washington State			
Number below Poverty Line	517,933	612,370	751,824
Percent of total population	10.9%	10.6%	11.8%
Whatcom County			
Number below Poverty Line	15,142	23,003	27,421
Percent of total population	12.3%	14.2%	14.5%
City of Bellingham			
Number below Poverty Line	8,033	12,854	16,290
Percent of total population	16.7%	20.6%	21.6%
Census Tract #6			
Number below Poverty Line	388	131	NA
Percent of total population	23.7%	27.3%	NA
Census Tract #10			
Number below Poverty Line	1,479	1,892	NA
Percent of total population	45.1%	52.0%	NA
Census Tract #11			
Number below Poverty Line	538	754	NA
Percent of total population	9.2%	11.9%	NA

Source: U.S. Census Bureau, 2009

The unemployment rate in the state of Washington has steadily increased since 1990, reaching 6.5 percent in 2007 (see **Table 5.18-16** below). In 2007, the unemployment rate within Whatcom County (6.2 percent) and the city of Bellingham (6.4 percent) were slightly below the state's unemployment rate. The unemployment rates for the Census Tracts vary widely: In 2000, Census Tract #6 had the same unemployment as the city (10.3 percent); Census Tract #11 was less than that of the city with 3.2 percent unemployment; while Census Tract #10 was significantly higher

at 35.4 percent (an increase of 28.2 percent since 1990). Combined, the three Census Tracts have an unemployment rate of 24.1 percent.

Table 5.18-16: Number of Workers and Unemployment Rate

Location	1990	2000	2007
Washington State			
Number of Workers	2,487,073	3,027,734	3,312,856
Unemployment Rate	5.6%	6.1%	6.5%
Whatcom County			
Number of Workers	64,846	87,365	98,747
Unemployment Rate	4.8%	7.4%	6.2%
City of Bellingham			
Number of Workers	27,746	37,631	41,920
Unemployment Rate	4.7%	10.3%	6.4%
Census Tract #6			
Number of Workers	258	278	NA
Unemployment Rate	4.7%	10.3%	NA
Census Tract #10			
Number of Workers	251	1,618	NA
Unemployment Rate	7.2%	35.4%	NA
Census Tract #11			
Number of Workers	87	113	NA
Unemployment Rate	2.9%	3.2%	NA

Source: U.S. Census Bureau, 2009

Three professions that MOC-P would typically need and could be impacted locally by the proposed action are Captains, Mates and Pilots of Water Vessels, Sailors and Marine Oilers, and Ship Engineers. Figures regarding these occupations are not available at a local level, however, MSAs provide a geographical unit from which to analyze local or regional employment within these occupations. The Bellingham MSA which includes Whatcom County has small population of people trained in marine related industries. As of 2006 there were 1,489 Captains, 1,886 Sailors and 981 Engineers in the State of Washington. The Bellingham MSA comprises of 65 Captains, 142 Sailors and 6 Engineers. (State of Washington Employment Security Department, 2008)

Due to an increase in population, the housing stock within the State has also increased. The majority of housing units built in the past 17 years has been single-family homes; with a lower rate of increase for multifamily dwellings and almost stagnant growth in mobile homes (see **Table 5.18-17** below). This trend is unlike higher density urban areas where space is limited and fewer single family homes are built relative to multifamily dwellings. In Whatcom County 63.2% of the housing stock consists of single-family homes. The City of Bellingham is more urbanized area with 51% of the housing consisting of single-family homes. The three Census Tracts analyzed represent an urban core with just 17.4 percent (combined) of the housing consisting of single-family dwellings.

Table 5.18-17: Housing by Type

Housing Type	1990	2000	2007
Washington State			
Single Family	1,320,807	1,603,674	1,788,563
Multifamily	504,374	626,917	697,581
Mobile Home or Other	207,197	220,484	212,786
Whatcom County			
Single Family	37,544	47,183	53,708
Multifamily	10,836	17,175	21,644
Mobile Home or Other	7,362	9,535	9,583
City of Bellingham			
Single Family	13,176	16,072	17,400
Multifamily	8,011	12,524	15,689
Mobile Home or Other	927	829	824
Census Tract #6			
Single Family	3	16	NA
Multifamily	327	409	NA
Mobile Home or Other	7	0	NA
Census Tract #10			
Single Family	442	468	NA
Multifamily	1,037	1,252	NA
Mobile Home or Other	64	36	NA
Census Tract #11			
Single Family	39	101	NA
Multifamily	924	1,083	NA
Mobile Home or Other	27	0	NA

Source: U.S. Census Bureau, 2009

As of 2006 (the most current available full-year data), the median price of a home in Whatcom County was $282,300, almost doubling from a median price of $146,500 in 2000 (Washington State University Center for Real Estate Research, 2009). While house prices are likely to have fallen during the recent economic downturn, the overall increase in housing prices has far outpaced the increases in annual income during a similar period (a 16.9 percent increase in median household income from 2000 to 2007 (U.S. Census Bureau, 2009)).

Within Whatcom County there are several school districts, the largest being the Bellingham School District. Since 2004 the number of students in the Bellingham School District has not changed substantially, as shown in **Table 5.18-18** below. The high in 2007 was 10,805 students; the low in 2005 was 10,575 students; representing a modest fluctuation of 230 students.

Table 5.18-18: Annual Number of Students

District	2004	2005	2006	2007
Bellingham	10,763	10,575	10,714	10,805

Source: State of Washington Office of Superintendent of Education, 2008.

5.18.4.2 Environmental Consequences

The proposed action at Site Alternative 3 is expected to provide minor economic opportunities to the community. Short-term economic effects would be positive as a result of construction-related development for piers and upland facilities. Long-term effects would be positive as some opportunities for local employment and added retail activity and a need for support services would accrue to the local community.

The proposed action would have a minimal influence on the population growth in the surrounding area and would slightly increase the size of the local population. Individuals who currently work at the Seattle MOC-P location may relocate to this new location, while others may not and local individuals would be hired to meet the needs of the new facility. Some existing staff would not relocate and may decide to retire or take other positions, in some cases severing a long-time association as a NOAA employee in support of MOC-P. Some quality-of-life changes for several employees may result from a MOC-P relocation from the Seattle metropolitan area.

The percentage of minority populations within Census Tract #6 and adjoining Tracts #10 and #11 is similar to that of the surrounding city and county, and below those of the state as a whole. Minority populations would therefore not be disproportionately affected by any potential adverse effects associated with the proposed action.

The adjacent Census Tract, #10, has over fifty percent of its population living in poverty. However no adverse environmental or health related impacts associated with this alternative would occur to socioeconomically disadvantaged population.

A short-term increase in employment may occur during the construction period, however the economic effect would be negligible relative to the local economy. Local or regional populations that work in the maritime industry within Whatcom County may be hired as employees or contractors, but the effect would be negligible relative to the overall local economy. Overall the effect on employment would be positive.

The affected area has an adequate real estate stock that would not be adversely affected by the proposed action. The local market has an even mix of single-family and multifamily residences, giving individuals and families with varying socioeconomic status adequate options for housing. Likewise, the effect of the project on educational opportunities would be negligible. New students associated with the proposed action would be substantially less than the annual fluctuation of the local student population.

The proposed action at Site Alternative 3 would have a negligible socioeconomic effect and no minority or low-income populations would be adversely affected.

5.18.4.3 Mitigation Measures

No mitigation measures are recommended in relation to socioeconomic impacts for the proposed action at Site Alternative 3.

5.18.5 Site Alternative 4: Newport

5.18.5.1 Affected Environment

The proposed action under Site Alternative 3 would occur within the city of Newport, Lincoln County, on the central Oregon coast. Newport is the largest city in the county. Key industries within Lincoln County include logging, fishing, agriculture and tourism. As a scenic and relatively rural setting in a temperate climate, this portion of the Oregon coast is a summer season tourist destination.

As shown in **Table 5.18-19** below, the population of Newport in 2000 was 9,532, with an annual growth rate of 1.3 percent between 1990 and 2000. In comparison, populations within the state of Oregon and Lincoln County have increased at annual growth rates of 1.8 percent and 1.0 percent, respectively. Site Alternative 4 is centrally located within Census Tract #9512 Lincoln County, Oregon. Between 1990 and 2000 the Census Tract experienced a negative annual growth rate of -0.8 percent. A map showing the approximate boundary of this alternative within the census tract is provided in **Appendix F-4**.

Statewide approximately 14 percent of the population is defined as a minority population, with a smaller percentage residing within Lincoln County (8.4 percent) in 2007 and the city of Newport (11.4 percent) as of 2000. For Census Tract #9512, the percentage of people having minority status in 2000 (4.4 percent) is lower than the state, county and city.

Table 5.18-19: Population and Minority Status

	1990		2000		2007	
Location	**Population**	**Percent**	**Population**	**Percent**	**Population**	**Percent**
Oregon State	**2,842,321**	**100.0%**	**3,421,399**	**100.0%**	**3,689,498**	**100.0%**
White	2,636,787	92.8%	2,961,623	86.6%	3,178,782	86.2%
Minority	205,534	7.2%	459,776	13.4%	510,716	13.8%
Lincoln County	**38,889**	**100.0%**	**44,479**	**100.0%**	**45,650**	**100.0%**
White	8,090	20.8%	40,292	90.6%	41,832	91.6%
Minority	30,799	79.2%	4,187	9.4%	3,818	8.4%
City of Newport	**8,437**	**100.0%**	**9,532**	**100.0%**	**NA**	**NA**
White	8,090	95.9%	8,442	88.6%	NA	NA
Minority	347	4.1%	1,090	11.4%	NA	NA
Census Tract #9512	**1,877**	**100.0%**	**1,736**	**100.0%**	**NA**	**NA**
White	1,814	96.6%	1,660	95.6%	NA	NA
Minority	63	3.4%	76	4.4%	NA	NA

Source: U.S. Census Bureau, 2009

The annual population growth rate for the State is projected to decrease to 1.4 percent while Lincoln County's growth rate is projected to decrease to 0.8 percent. Lincoln County is expected to continue to grow at a slower rate than that of the state up to 2030, at which time it will represent a little more than one percent of the state's total population, as shown in **Table 5.18-20** below.

Table 5.18-20: Population Projections

Location	2007	2020	2030
State of Oregon	3,689,498	4,359,258	4,891,225
Lincoln County	45,650	50,379	53,710

Source: State of Oregon Department of Economic Analysis, 2008.

The percent of the population living in poverty is determined from the number of individuals or families earning less than a certain amount of annual income. Each year the U.S. Census Bureau adjusts this amount based on inflation and other factors (U.S. Census Bureau, 2008). The following values represent the poverty threshold for a family of four with two dependents:

- 1990 - $13,254
- 2000 - $17,463
- 2007 - $21,027

As shown in **Table 5.18-21** below, the percentage of people living in poverty has increased statewide, including within Lincoln County. Similarly, from 1990 to 2000, the City of Newport had a slight increase in the percentage of people living in poverty. However, Census Tract #9512 had a slight decrease in the percentage of people living in poverty from 1990 to 2000. This trend may have changed over the past seven years in response to what has happened in the state and Lincoln County.

Table 5.18-21: Poverty Status

Location	1990	2000	2007
Oregon State			
Number below Poverty Line	344,867	388,740	498,082
Percent of total population	12.4%	11.6%	13.5%
Lincoln County			
Number below Poverty Line	5,524	6,084	8,034
Percent of total population	14.4%	13.9%	17.6%
City of Newport			
Number below Poverty Line	989	1,330	NA
Percent of total population	11.9%	14.4%	NA
Census Tract #9512			
Number below Poverty Line	191	150	NA
Percent of total population	10.7%	8.9%	NA

Source: U.S. Census Bureau, 2009

The unemployment rate in the state of Oregon has steadily increased since 1990; reaching 6.9 percent in 2007 (refer **Table 5.18.22**). The 2007 unemployment rate within Lincoln County was 6.3 percent. Conversely, the city of Newport was well above the state's 2000 unemployment rate at 9.0 percent. The unemployment rate for Census Tract #9512 has historically been below the state, county and city averages in 1990 and 2000.

Table 5.18-22: Number of Workers and Unemployment Rate

Location	1990	2000	2007
Oregon State			
Number of Workers	1,410,695	1,742,638	1,897,202
Unemployment Rate	6.2%	6.5%	6.9%
Lincoln County			
Number of Workers	17,500	21,079	20,895
Unemployment Rate	5.6%	8.3%	6.3%
City of Newport			
Number of Workers	4,198	4,814	NA
Unemployment Rate	6.5%	9.0%	NA
Census Tract #9512			
Number of Workers	851	877	NA
Unemployment Rate	4.8%	4.6%	NA

Source: U.S. Census Bureau, 2009

Three professions that MOC-P would typically need and could be impacted locally by the proposed action are Captains, Mates and Pilots of Water Vessels, Sailors and Marine Oilers, and Ship Engineers (53-5031). Figures regarding these occupations are not available at a local level, however, MSAs provide a geographical unit from which to analyze local or regional employment within these occupations. The Benton, Linn, Lincoln MSA which includes Newport has small population trained in marine related industries. As of 2006 there were 349 Captains, 472 Sailors and 95 Engineers in the State of Oregon. The Benton, Linn, Lincoln MSA comprises of 23 Captains, 17 Sailors and 2 Engineers (State of Oregon Employment Department, 2008).

Due to population growth in the State, the housing stock has increased. The majority of the housing units built in the past 17 years have been single family homes, with fewer increases in multifamily dwellings and almost stagnant growth in mobile homes (see **Table 5.18-23** below). Normally in higher density urban areas where space is limited, fewer single family homes are built and more multifamily dwellings are constructed. Lincoln County is not a highly urbanized area and the percentage of single family homes (65.7 percent) is similar to the state average (67.5 percent). The City of Newport does not share the same trend as the state and county, with almost a fifty-fifty split between single family homes and other types of residences. Census Tract #9512 is similar to the state and county figures, with 67 percent of the residences being single family homes.

From the most current data[3], the median home price within Lincoln County was $250,000 which is below the median statewide home price of $278,956 (BST Associates, 2008). The average annual sales volume is unknown, however, it is expected that the proposed action would have a positive, minor impact on the local housing market.

Table 5.18-23: Housing by Type

Housing Type	1990	2000	2007
Oregon State			
Single Family	796,613	959,266	1,070,189
Multifamily	251,810	334,897	364,911
Mobile Home or Other	145,144	158,546	149,792
Lincoln County			
Single Family	14,516	17,655	18,768
Multifamily	3,014	4,429	4,663
Mobile Home or Other	4,859	4,805	5,119
City of Newport			
Single Family	2,333	2,723	NA
Multifamily	1,092	1,605	NA
Mobile Home or Other	680	691	NA
Census Tract #9512			
Single Family	563	684	NA
Multifamily	43	79	NA
Mobile Home or Other	338	257	NA

Source: U.S. Census Bureau, 2009

Within Lincoln County there is one school district. Since 2003 the number of students in the Lincoln County School District has decreased each year, as shown in **Table 5.18-24** below. The high in 2003 was 6,117 students, with a low in 2006 of 5,831 students representing a decrease in the student population of 286 students over four years.

Table 5.18-24: Annual Number of Students

District	2003	2004	2005	2006
Lincoln County	6,117	5,964	5,890	5,831

Source: State of Oregon Department of Education, 2008

5.18.5.2 Environmental Consequences

The proposed action at Site Alternative 4 is expected to provide minor economic opportunities to the community. Short-term economic effects would be positive as a result of construction-related development for piers and upland facilities. Long-term effects would be positive as some opportunities for local employment and added retail activity and a need for support services would accrue to the local community.

[3] The BST Associates, 2008 report did not state what year the most current housing price data was for.

The proposed action would have a negligible influence on the population growth. Individuals who currently work at MOC-P may relocate, while others may not and local individuals may be hired. Given the relatively high unemployment rate for the community, this infusion of short-term and long-term employment opportunities would represent a minor positive effect. Some existing staff would not relocate and may decide to retire or take other positions, in some cases severing a long-time association as a NOAA employee in support of MOC-P. Some quality-of-life changes for several employees may result from a MOC-P relocation from the Seattle metropolitan area.

The percent of minority populations within the Census Tract is similar to the city and county, and well below those for the state. Minority populations would not be disproportionately affected by the proposed action.

The percent of people living under the poverty line within the Census Tract has been smaller than the city, county or state levels for 1990 and 2000. Low-income populations would not be disproportionately affected by the proposed action.

A short-term increase in employment may occur during the construction period; however the economic effect would be minor relative to the local economy. Local or regional populations that work in the maritime industry within Lincoln County may be hired as employees or contractors, but the effect would be minor relative to the overall local economy. Overall the effect on employment would be positive.

The proposed MOC-P facility is not expected to adversely affect the local real estate market. Short-term impacts may increase real estate sales due to the relocation of some MOC-P staff. The proposed action would have little effect in the long-term given the stable number of staff associated with MOC-P. Likewise, the effect of the project on educational opportunities would be negligible. New students associated with the proposed action would be substantially less than the annual fluctuation of the local student population.

The proposed action at Site Alternative 4 would have a negligible socioeconomic effect. No minority or low-income populations would be adversely affected by the proposed action at Site Alternative 4.

5.18.5.3 Mitigation Measures

No mitigation measures are recommended in relation to socioeconomic impacts for the proposed action at Site Alternative 4.

5.19 CUMULATIVE IMPACTS

Cumulative impacts result when the effects of an action are added to or interact with other effects in a particular place and within a particular time. It is the combination of these effects, and any resulting environmental degradation, that is the focus of this cumulative impact analysis. While impacts can be differentiated by direct, indirect, and cumulative, the concept of cumulative impacts takes into account all foreseeable disturbances, since cumulative impacts result in the compounding of the effects of all actions over time. Thus, the cumulative impacts of an action can be viewed as the total effects on a resource, ecosystem, or human community no matter what entity (federal, non-federal, or private) is taking the action(s) (USEPA, 1999).

This analysis of cumulative effects summarizes the evaluation of resources, ecosystems, and human communities identified and discussed in this EA relative to other foreseeable future actions. It considers the proximity and timing of other concurrent or future foreseeable actions and the potential for exacerbated effects or conflicts that would result in a potentially significant impact. The evaluation considers resources subject to potential cumulative effects and refers back, if necessary, to information presented in the earlier discussion of project-only effects.

In general, the proposed action is not reliant upon or connected to other actions, nor is it relied upon for the occurrence of other actions. For each of the subject areas analyzed, the contribution of the proposed action is not expected to be considerable provided that appropriate mitigation measures are implemented.

5.19.1 No-Action Alternative

5.19.1.1 Existing Environment

No new development or activities would occur under the No-Action Alternative.

5.19.1.2 Environmental Consequences

Cumulative effects would not occur under the No-Action Alternative.

5.19.1.3 Mitigation Measures

No mitigation measures relative to cumulative effects are recommended for the No-Action Alternative.

5.19.2 Site Alternative 1: Lake Union

5.19.2.1 Existing Environment

The area adjacent to the proposed action at Site Alternative 1 is a mix of waterfront residential, commercial, retail, and industrial. The King County SMP calls for a mix of uses along the waterfront. Developments in this portion of Lake Union have been evolving very slowly over the last 25 years, however, private commercial multi-story structures are currently under construction within one-quarter mile of the subject site. No foreseeable new development is anticipated, particularly along adjacent waterfront locations where the drydock facility immediately south and a residential houseboat neighborhood to the north are likely to remain largely unchanged in the foreseeable future.

The Site Alternative is located within the city's Eastlake Neighborhood. The City of Seattle's Department of Neighborhoods has established the Eastlake Neighborhood Plan; however, this document was last updated in 1998. Hence it may not be an accurate gauge of current planning goals and objectives (City of Seattle, 2009a). The plan calls for retaining the value of neighborhood residential areas by keeping segments of Fairview Avenue East as narrow corridors and small shoreline parks intact. Commercial and retail shoreline development has been more prevalent within the South Lake Union neighborhood, over a mile to the southwest.

5.19.2.2 Environmental Consequences

The anticipated effects of the proposed action at Site Alternative 1 are not expected to be substantially exacerbated by current or anticipated commercial development within one-quarter mile. In fact, little future development within the adjacent shoreline properties is expected to occur. Overall, cumulative effects of the proposed action when considered with other foreseeable actions near this Site Alternative are not expected to result in a significant impact to any of the resource areas and environmental topics analyzed.

5.19.2.3 Mitigation Measures

No mitigation measures in relation to cumulative effects are recommended for Site Alternative 1.

5.19.3 Site Alternative 2: Port Angeles

5.19.3.1 Existing Environment

Based on the Port of Port Angeles Marine Facilities Master Plan prepared in March 2006 (Makers, 2006), there are several scenarios for future development at and near Site Alternative 2. These include continued use of Terminal 3 for topside repair, fish processing and cruise ships, and relocation further west of the log raft area within the adjacent harbor waters. The Plan

includes implementation of the Port Angeles Boat Haven Master Plan and additional marina support and marine commercial developments, one of which is adjacent to Site Alternative 2 (southwest corner). Acquisition of land to the south of the subject site is also considered for future marine support facilities.

5.19.3.2 Environmental Consequences

The anticipated effects of the proposed action at Site Alternative 2 are not expected to be substantially exacerbated by current or anticipated port industrial and commercial development within one-quarter mile. In fact, future development within adjacent port properties is expected to occur slowly over time. Cumulative effects of the proposed action when considered with other foreseeable actions near this Site Alternative are not expected to result in a significant impact to any of the resource areas and environmental topics analyzed.

5.19.3.3 Mitigation Measures

No mitigation measures in relation to cumulative effects are recommended for Site Alternative 2.

5.19.4 Site Alternative 3: Bellingham

5.19.4.1 Existing Environment

The Port of Bellingham plans to establish a detailed Master Development Plan for the New Whatcom Redevelopment Area, and is considering various options for redevelopment evaluated in a 2008 SEPA Environmental Impact Statement (Port of Bellingham, 2008). While a preferred Master Development Plan has not been selected, the approved Plan option would transform the New Whatcom area into a new neighborhood with residences, shops, offices, marine and light industry, institutional uses (e.g., Western Washington University), as well as parks, trails and shoreline habitat along the bay and visitor moorage facilities. The Master Plan would include substantial new opportunities for public access to the waterfront that do not exist under current conditions.

The Port owns and/or manages approximately 193 acres, which includes the former Georgia Pacific Tissue Mill, the Tissue Warehouse, the Aerated Stabilization Basin, the Bellingham Shipping Terminal, and other industrial lands within the site area. Another approximately 17 acres of the site contain various marine industrial and industrial uses that are owned by other parties.

Separately, the Port of Bellingham is contemplating certain improvements at the Bellingham Shipping Terminal to accommodate large vessels. These improvements are planned independent of the New Whatcom redevelopment, and were addressed on a cumulative basis in the EIS.

5.19.4.2 Environmental Consequences

The anticipated effects of the proposed action at Site Alternative 3 are not expected to be substantially exacerbated by current or anticipated port redevelopment within one-quarter mile. In fact, future development within adjacent port properties have been analyzed with prospective actions similar to the proposed action contemplated. Cumulative effects of the proposed action when considered with proposed redevelopment actions near this Site Alternative are not expected to result in a significant impact to any of the resource areas and environmental topics analyzed.

5.19.4.3 Mitigation Measures

No mitigation measures in relation to cumulative effects are recommended for Site Alternative 3.

5.19.5 Site Alternative 4: Newport

5.19.5.1 Existing Environment

The South Beach Redevelopment and Renewal Plan specifies water-dependent uses for any proposed facilities at the subject site, and has already funded improved infrastructure and pedestrian routes in the vicinity of the project area (City of Newport, 2006). No other specific development plans were identified for the subject property.

Future development of the Hatfield Marine Science Center may occur within its existing boundary adjacent to the proposed site. As a leading marine-related institute in the Pacific Northwest, future site development is focused on marine and water-related programs, including the need to support seawater storage and infrastructure.

The Hatfield Marine Science Center policy is to provide for facilities that offer advanced technological capabilities and adequate support space for laboratories, offices, conference and seminar rooms, classrooms, and public gathering spaces. Future development would also provide flexibility to meet the evolving, multi-use program needs of the center's research, education and outreach initiatives (OSU, 2007).

The Center intends to focus development of its campus to improve pedestrian systems and open spaces to provide safe and well-defined areas for researchers and visitors. Proposed expansion or improvements to pedestrian systems would provide connectivity between the Center and its neighbors and ease of egress to exit and enter the center.

5.19.5.2 Environmental Consequences

The anticipated effects of the proposed action at Site Alternative 4 are not expected to be substantially exacerbated by current or anticipated redevelopment within one-quarter mile. Future development within adjacent port properties and the South Beach region have been

analyzed. These developments are such that cumulative impacts would not be likely or would improve conditions relative to vehicle and pedestrian circulation. Cumulative effects of the proposed action when considered with proposed redevelopment actions near this Site Alternative are not expected to result in a significant impact to any of the resource areas and environmental topics analyzed.

5.19.5.3 Mitigation Measures

No mitigation measures in relation to cumulative effects are recommended for Site Alternative 4.

6 SUMMARY OF POTENTIAL IMPACTS

The following table summarizes the potential impacts of the proposed action under each Site Alternative (including the No-Action Alternative), by environmental resource.

Table 6-1: Summary of Potential Impacts

Environmental Resource	No-Action Alternative	Site Alternative 1: Lake Union	Site Alternative 2: Port Angeles	Site Alternative 3: Bellingham	Site Alternative 4: Newport
Land Use	No impacts.	No impacts.	No impacts.	No impacts.	No impacts.
Geological Resources	No impacts.	Erosion could occur if slopes greater than a 15% grade are constructed. The site could experience earthquakes, moderate ground shaking, and high liquefaction.	Erosion could occur if slopes greater than a 15% grade are constructed. The site could experience earthquakes, high levels of ground shaking, moderate to high liquefaction, and tsunamis.	Erosion could occur if slopes greater than a 15% grade are constructed. The site could experience earthquakes, high levels of ground shaking, high liquefaction, and tsunamis.	Erosion could occur if slopes greater than a 15% grade are constructed. The site could experience earthquakes, severe ground shaking, ground rupture, high liquefaction, and tsunamis.
Air Quality	Air and greenhouse gas emissions would be negligible.	Project-related operational emissions, marine-based activities, and greenhouse gas emissions would be less than significant.	Project-related operational emissions, marine-based activities, and greenhouse gas emissions would be less than significant.	Project-related operational emissions, marine-based activities, and greenhouse gas emissions would be less than significant.	Project-related operational emissions, marine-based activities, and greenhouse gas emissions would be less than significant.
Water Resources	Treated wood pilings may be contributing to effects upon the water quality of Lake Union, as chemicals (e.g., creosote, arsenic, chromium, copper) may leach from the wood.	During construction, the replacement of sections of pilings and installation of new pilings could temporarily degrade water quality as sediments are disturbed and	Upland construction activities could temporarily degrade nearshore harbor surface water. Eastern areas of the site have been identified as having petroleum hydrocarbon-	Upland construction activities could temporarily degrade nearshore surface water quality. Installation of dolphins, other new pilings and the bulkhead would result in short-term	Upland construction activities could temporarily degrade nearshore harbor surface water. Installation of new pilings could temporarily degrade water quality.

Environmental Resource	No-Action Alternative	Site Alternative 1: Lake Union	Site Alternative 2: Port Angeles	Site Alternative 3: Bellingham	Site Alternative 4: Newport
		resuspended.	impacted soils. Release of these soils to the harbor could impact water quality. Installation of new pilings could temporarily degrade water quality.	degradation of water quality when sediments are disturbed and resuspended.	
Recreational Resources	No impacts.	No impacts.	No impacts.	No impacts.	No impacts.
Cultural Resources	No impacts.	The site has a moderate probability for containing buried cultural resources. Below-fill construction and utility installation, if any, could disturb natural sediments along the former beach and shoreline resulting in potential direct impacts to resources.	The site has a moderate to high probability for containing buried cultural resources. Below-fill construction and utility installation, if any, could disturb natural sediments along the former beach and shoreline resulting in potential direct impacts to resources.	The site has a moderate probability for containing buried cultural resources. Below-fill construction and utility installation, if any, could disturb natural sediments along the former beach and shoreline resulting in potential direct impacts to resources.	The site has a moderate probability for containing buried cultural resources. Below-fill construction and utility installation, if any, could disturb natural sediments along the former beach and shoreline resulting in potential direct impacts to resources.
Flora and Fauna	Allowing the shoreline to remain in its existing condition would continue to perpetuate the low-quality aquatic habitat conditions.	The short-term effects of construction on aquatic species would be localized and less than significant. Long-term effects to fish and aquatic vegetation from shading by overwater structures would be a moderate impact.	Temporary impacts to migratory birds are likely to occur due to disturbance in nesting habitats. Impacts to flora and fauna during construction would be moderate due to the habitat loss and dredging. Shading from the	Temporary impacts to migratory birds are likely to occur due to disturbance in nesting habitats. Impacts to flora and fauna during construction would be minor due to the limited scope of in-water work. Shading from the overwater structures	Temporary impacts to migratory birds are likely to occur due to disturbance in nesting habitats. Impacts to flora and fauna during construction would be moderate due to the number of species impacted, the direct habitat loss, and dredging.

Environmental Resource	No-Action Alternative	Site Alternative 1: Lake Union	Site Alternative 2: Port Angeles	Site Alternative 3: Bellingham	Site Alternative 4: Newport
			overwater structures would be a moderate impact.	would be a moderate impact.	Shading from the overwater structures would be a moderate impact.
Essential Fish Habitat (EFH)	Existing conditions would remain as a low-quality salmon EFH area. Due to the limited extent of anticipated in-water activities and absence of HAPC, the extent of potential adverse effects is considered to be less than significant, provided that appropriate mitigation measures are implemented.	EFH would be adversely affected during construction. Due to the limited extent of anticipated in-water activities and absence of HAPC, the extent of potential adverse effects is considered to be less than significant, provided that appropriate mitigation measures are implemented.	EFH would be adversely affected during construction, including the addition of new over-water structures, and dredging. Due to the extent of anticipated in-water activities and limited presence of HAPC, the extent of potential adverse effects is considered to be less than significant, provided that appropriate mitigation measures are implemented.	EFH would be adversely affected during construction, including the extension of the existing over-water structure. Due to the limited extent of anticipated in-water activities and limited presence of HAPC, the extent of potential adverse effects is considered to be less than significant, provided that appropriate mitigation measures are implemented.	Near-shore marine EFH would be adversely affected during construction, including the addition of new over-water structures. Due to the extent of anticipated in-water activities and limited presence of HAPC, the extent of potential adverse effects is considered to be less than significant, provided that appropriate mitigation measures are implemented.
Wetlands and Navigable Waters	No impacts.	Pile stubbing and installation of piling extensions may be necessary within navigable waters of the U.S. and the state of Washington, potentially affecting navigation.	Removal and installation of pilings and dredging may be necessary within navigable waters of the U.S. and the state of Washington, potentially affecting marine navigation.	Removal and installation of pilings may be necessary within navigable waters of the U.S. and the state of Washington, potentially affecting marine navigation.	Removal and installation of pilings and dredging for adequate berth depths may be necessary within navigable waters of the U.S. and state of Oregon, potentially affecting marine navigation.
Floodplains	No impacts.	No impacts.	The proposed pier extension of Terminal 3 could be impacted by	No impacts.	The proposed dock could be impacted by flooding, particularly if

Environmental Resource	No-Action Alternative	Site Alternative 1: Lake Union	Site Alternative 2: Port Angeles	Site Alternative 3: Bellingham	Site Alternative 4: Newport
			flooding, and the structure may affect the characteristics of flooding in the area by altering the way in which floodwaters and waves circulate. The site could be affected by storm surge during large storm events, however the magnitude of the surge would likely be somewhat abated by the protection of Ediz Hook.		the finished level of the dock is below the predicted elevation of the 100-year flood event The dock may affect the characteristics of flooding in the area by trapping debris against the piles of the dock and/or altering the way in which floodwaters circulate/flow within the bay. If the major earthworks proposed lower the elevation of the site, additional structures could be within the 100-year floodplain. The site has potential to be affected by storm surge during large storm events.
Coastal Zone Management	No impacts.	No impacts.	No impacts.	No impacts.	No impacts.
Agricultural Resources	No impacts.	No impacts.	No impacts.	Negligible effects on aquaculture would arise from short-term impacts to water quality during construction.	Minor, short-term impacts to the Hatfield Marine Science Center's Molluscan Broodstock Program could occur from short-term impacts to water quality during in-water construction.
Noise	No impacts.	Construction noise would not be significant at sensitive noise	Construction noise would have an impact to adjacent areas only	Construction noise would have an impact to adjacent areas only	Construction noise would have an impact to adjacent areas only and

Environmental Resource	No-Action Alternative	Site Alternative 1: Lake Union	Site Alternative 2: Port Angeles	Site Alternative 3: Bellingham	Site Alternative 4: Newport
		receptors.	and would not be significant at sensitive noise receptors.	and would not be significant at sensitive noise receptors.	would not be significant at sensitive noise receptors.
Transportation	No impacts.	Under the worst-case scenario, this alternative would generate approx. 365 additional daily trips, with approx. 263 trips occurring during the a.m. peak hour and approx. 215 trips occurring during the p.m. peak hour. However, this would not result in a significant impact to transportation.	Under the worst-case scenario, this alternative would generate approx. 455 daily trips, with approx. 367 trips occurring during the a.m. peak hour and approx. 305 trips occurring during the p.m. peak hour. However, this would not result in a significant impact to transportation. Vehicles currently using the site as a parking lot would need to find parking elsewhere in the vicinity.	Under the worst-case scenario, this alternative would generate approx. 455 daily trips, with approx. 367 trips occurring during the a.m. peak hour and approx. 305 trips occurring during the p.m. peak hour. However, this would not result in a significant impact to transportation.	Under the worst-case scenario, this alternative would generate approx. 455 daily trips, with approx. 367 trips occurring during the a.m. peak hour and approx. 305 trips occurring during the p.m. peak hour. However, this would not result in a significant impact to transportation.
Utilities and Solid Waste	No impacts.	No impacts.	The following utilities would need to be extended to serve the new pier: potable water, electricity, sanitary sewer, and fire protection.	No impacts.	The existing power supply would need to be upgraded from a source approximately 1500 feet to the south. The new supply is likely to be underground.
Visual and Aesthetic Resources	From a regional context this alternative would have a moderate negative effect.	The anticipated visual impact would be positive, albeit minor.	The anticipated visual impact would be positive, albeit minor.	The anticipated visual impact would be positive, albeit minor.	The visual effect would be moderate given views from the U.S. 101 off ramps and the Yaquina Bay Bridge, and direct views from commercial/retail

Environmental Resource	No-Action Alternative	Site Alternative 1: Lake Union	Site Alternative 2: Port Angeles	Site Alternative 3: Bellingham	Site Alternative 4: Newport
					waterfronts supporting tourism.
Hazardous Materials	No impacts.	Construction is likely to have minor impacts on the known soil or groundwater contaminants at upland portions of the site. Construction activities and ongoing operation of the MOC-P homeport facility could impact potentially contaminated lakebed sediments. Preparation work for the renovations of the administration and warehouse/laboratory buildings, and demolition of the boat storage and shop buildings, would require removal of ACM and any lead-based paints. Moored vessels may be fueled via fuel trucks, increasing the risk of accidental spills or leaks. If vessels mooring at the facility require hazardous materials to be loaded or unloaded from the vessels, the risk of accidental spills	There is potential for spills of hazardous materials if the AST is not properly closed, and if the hazardous materials in the shop building are not property disposed of. There is potential for ACM or lead-based paint to be present within the existing maintenance shop building. The proposed replacement of the bridge, sheet piling and trestles over Tumwater Creek would result in soil disturbance in the eastern portions of the site, and therefore could impact contaminated sediments and groundwater. Construction activities and ongoing operation could impact potentially contaminated marine sediments. Moored vessels may be fueled via fuel trucks, increasing the risk of	There is potential for spills of hazardous materials if the shop building is not emptied of hazardous materials prior to demolition and properly disposed of. There is known ACM and lead-based paint within the existing warehouse to be demolished. There may be light fixtures containing PCBs and mercury or sodium vapor within both existing buildings on site. Disturbance of contaminated sediments and/or groundwater for building foundations could adversely affect the health and safety of workers, or could result in the migration of contaminants. Construction activities and ongoing operation could impact contaminated marine and nearshore sediments.	There is potential for spills of hazardous materials if the generator, fuel pipes, and ASTs are not completely emptied and decontaminated and properly disposed of. There is potential for ACM or lead-based paint to be present within the existing pumphouse building. Planned earthworks could impact contaminated sediments and groundwater, if such contamination exists. Construction activities and ongoing operation of the MOC-P homeport facility could impact potentially contaminated marine sediments. Moored vessels may be fueled via fuel trucks, increasing the risk of accidental spills or leaks. If vessels mooring at the facility require hazardous materials to be loaded or unloaded

Environmental Resource	No-Action Alternative	Site Alternative 1: Lake Union	Site Alternative 2: Port Angeles	Site Alternative 3: Bellingham	Site Alternative 4: Newport
		or leaks would increase.	accidental spills or leaks. If vessels mooring at the facility require hazardous materials to be loaded or unloaded from the vessels, the risk of accidental spills or leaks would increase.	Moored vessels may be fueled via fuel trucks, increasing the risk of accidental spills or leaks. If vessels mooring at the facility require hazardous materials to be loaded or unloaded from the vessels, the risk of accidental spills or leaks would increase.	from the vessels, the risk of accidental spills or leaks would increase.
Socio-economics	Long-term economic effects would be moderate considering the lack of a central MOC-P headquarters for its entire staff, contractors, and interrelated functions.	Short-term economic effects would be positive. Long-term effects are considered to be minimal given the size and diversity of economic activity within the community and Census Tract. Effects on the local population would be negligible.	Short-term economic effects would be positive. Long-term effects are also considered to be positive. There would be a slight increase in local population. The long-term effect on employment would be negligible.	Short-term economic effects would be positive. Long-term effects are also considered to be positive. There would be a slight increase in local population. The long-term effect on employment would be negligible.	Short-term economic effects would be positive. Long-term effects are also considered to be positive. The economic effect would be minor, relative to the local economy.
Cumulative Impacts	No impacts.	No impacts.	No impacts.	No impacts.	No impacts.

7 SUMMARY OF MITIGATION MEASURES

The following is a summary of potential mitigation measures recommended for each of the site alternatives by environmental resource. There are no recommended measures for the following environmental resources: land use, air quality, recreational resources, noise, transportation, utilities and solid waste, visual and aesthetic resources, and socio-economics.

7.1 GEOLOGICAL RESOURCES

No mitigation measures related to geological resources are recommended for the No-Action Alternative.

For Site Alternatives 1, 2, 3, and 4, the following mitigation measures in relation to geological resources and hazards are recommended for the proposed action:

- Use of the standards outlined in the SFO which in general include Recommended Provision (RP) 6, *Standards for Existing Federally Owned and Leased Buildings*, the International Building Code (IBC) for new buildings and Unified Facilities Criteria (UFC) 4-152-01, *Design for Piers and Wharfs*.

7.2 WATER RESOURCES

No mitigation measures are recommended with respect to water resources for the No-Action Alternative.

For Site Alternatives 1, 2, and 3, impacts to water quality would be minimized by implementing measures that would result in adherence to the following regulations: water quality restrictions imposed by the WDOE (Chapter 173-201A WAC), and waste material disposal per WAC 220-110-070.

For Site Alternative 4, impacts to water quality would be minimized by implementing measures that would result in adherence to the water quality standards imposed by ODEQ (OAR 340-041).

For Site Alternatives 1, 2, 3, and 4, if the proposed action disturbs an area greater than one acre, a National Pollutant Discharge Elimination System (NPDES) Phase II Statewide General Construction Permit would be required. Site management under the permit would include the application of best management practices (BMPs) for sediment and stormwater control (e.g., sediment traps, barriers, covers, or other methods) during construction and operation of the MOC-P facilities. Surface drainage control should be included in the site development plans to minimize surface runoff to the harbor once the development is completed.

For Site Alternatives 1, 2, 3, and 4, example measures, or their equivalent, for site preparation and development activities could include:

- Regular, standard maintenance of catch basin socks and filters, as well as periodic removal and off-site disposal of catch basin sediments, should be conducted during the construction period.
- Demolition and construction materials should not be stored where high tides, wave action, or upland runoff could cause materials to enter surface waters. Excess or waste materials should not be disposed of or abandoned waterward of OHW or allowed to enter waters of the state.
- Waste materials, including hazardous waste and treated wood waste, should be disposed of in a landfill that meets relevant federal, state and local regulations.
- A containment boom surrounding the work area should be used during creosote-treated pile repair work to contain and collect any floating debris and sheen, provided that the boom does not interfere with operations. Action plans should include retrieval of any debris generated during construction and proper disposal of the debris at an approved upland location.
- Oil-absorbent materials should be present on site and be used in the event of a spill or if any oil product is observed in the water.
- Removed piles, stubs, and associated sediments (if any) should be contained on a barge either in a container or a storage area contained within a row of hay or straw bales or filter fabric around the perimeter of the barge.
- Any new timber piling should be non-creosote-treated piling such as steel or Ammoniacal Copper Zinc Arsenate (ACZA)-treated wood piling. ACZA-treated wood should be treated using the current American Wood Preservers' Association Standards.
- Wet concrete should not come in contact with state waters. Water inside forms should be drained to the water elevation outside the form before concrete is poured.
- Whenever activities that generate sawdust, drill tailings, or wood chips from treated timbers are conducted, tarps or other containment material should be used to prevent debris from entering the water. If tarps cannot be used (because of the location or type of structure), a containment boom should be placed around the work area to capture debris and cuttings.
- Pilings that break or already broken below the waterline should be removed with a clamshell bucket. To minimize disturbance to bottom sediments and splintering of

pilings, the contractor should use the minimum size bucket required to pull out pilings based on pile depth and substrate. The clamshell bucket should be emptied of pilings and debris on a contained barge before it is lowered into the water. If the bucket contains only sediment, the bucket should remain closed and be lowered to the mudline and opened to redeposit the sediment.

For Site Alternatives 1, 2, 3, and 4, example, or equivalent, measures for operation and maintenance activities under the proposed action could include:

- Regular, standard maintenance of catch basin socks and filters, as well as periodic removal and off-site disposal of catch basin sediments, should be conducted during long-term operation of MOC-P.
- Materials should not be stored where high tides, wave action, or upland runoff could cause materials to enter surface waters. Excess or waste materials should not be disposed of or abandoned waterward of OHW or allowed to enter waters of the state.
- Waste materials, including hazardous waste and treated wood waste, should be disposed of in a landfill that meets relevant federal, state and local regulations.
- Whenever activities such as sandblasting or painting are conducted over or near water, tarps or other containment material should be used to prevent materials or debris from entering the water. If tarps cannot be used (because of the location or type of activity), a containment boom should be placed around the work area to capture debris and cuttings. Any floating debris should be retrieved, and disposed of at an upland disposal site.

7.3 CULTURAL RESOURCES

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

For Site Alternatives 1, 2, 3, and 4, as no adverse effects to known historic, archaeological, or cultural resources were identified, no mitigation is necessary. However, it is possible that deeply buried, intact archeological deposits are present below the fill. If NOAA proceeds with one of these Site Alternatives, mitigation commensurate with future plans of development may be appropriate in consultation with applicable state, tribal and local agencies.

7.4 FLORA AND FAUNA

No mitigation measures with respect to flora and fauna are recommended under the No-Action Alternative.

For Site Alternatives 1, 2, and 3, no mitigation measures are recommended relative to terrestrial species or habitats. Impacts to aquatic species and habitats would be minimized by implementing measures that result in adherence to the following regulations: waste material disposal per WAC 220-110-070; and water quality restrictions imposed by the WDOE (Chapter 173-201A WAC).

For Site Alternative 4, impacts to aquatic species and habitats would be minimized by implementing measures that result in adherence to the water quality standards imposed by ODEQ (OAR 340-041).

For Site Alternatives 1, 2, 3, and 4, example, or equivalent, measures for aquatic species and habitats could include:

- Timing restrictions should be used for all in-water work to protect ESA-listed salmonids, as well as marine mammals (for marine sites). This measure reduces the number of species exposed to underwater noise and other disturbance.
- The vibratory hammer method should be used to the extent possible to drive steel piles in order to minimize underwater noise levels. A bubble curtain is not required during vibratory pile driving.
- A bubble curtain(s) should be employed during impact hammer installation of steel piles. Underwater noise should be minimized to the extent possible by driving the largest piles in the deepest water during the low-tide periods (if applicable).
- Design of overwater structures should allow as much light as possible (e.g., grating versus impervious surface) to the water to reduce shading impacts.

For Site Alternatives 2 and 4, planning and construction practices recommended for dredging are as follows:

- Use the smallest dredge practicable to accomplish the task and target the specific areas to be dredged.
- Avoid areas designated as priority habitat by WDFW (e.g., eelgrass beds, kelp beds).

For Site Alternative 4, the following mitigation measures are also recommended:

- A survey is recommended for short-stemmed sedge during the appropriate season before construction begins.
- Adverse impacts of future development on eelgrass beds, shell fish beds, and fish spawning and nursery areas should be minimized, consistent with allowed development.

7.5 ESSENTIAL FISH HABITAT

No mitigation measures are recommended in relation to EFH for the No-Action Alternative.

For Site Alternatives 1, 2, 3, and 4, in addition to the example measures identified relation to water resources and flora and fauna above, the following types of planning and construction practices could be undertaken on a site-specific basis to conserve EFH in areas with the potential to be affected by construction and urbanization activities.

- Plan development sites to minimize clearing and grading and cut-and-fill activities.
- During construction, temporarily fence setback areas to avoid disturbance of natural riparian vegetation and maintain riparian functions for EFH.
- Use BMPs such as avoiding ground disturbing activities during the wet season; minimizing the time disturbed lands are left exposed; using erosion prevention and sediment control methods; minimizing vegetation disturbance; maintaining vegetation buffers around wetlands, streams, and drainage ways; and avoiding building activities in areas of steep slopes with highly erodible soils.
- Use methods such as sediment ponds, sediment traps, or other facilities to slow water run-off and trap sediment and nutrients.
- Where feasible, remove impervious surfaces from riparian areas, and re-establish wetlands.

7.6 WETLANDS AND NAVIGABLE WATERS

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

For Site Alternatives 1, 2, and 3, no mitigation measures are recommended in relation to wetlands, however a JARPA should be completed and submitted for coordination with the USACE under Section 10 of the RHA and sections 404 and 401 of the CWA, the WDOE and locally affected governments.

For Site Alternative 4, no mitigation measures are recommended in relation to wetlands, however the proposed project would require review and approval under the state of Oregon Removal Fill Law (ORS 196.800 through 196.990), Section 10 of the RHA and Sections 404 and 401 of the CWA. The OSL, the DLCD and the USACE have designed a streamlined process for reviewing permit applications for fill and removal permits. Their joint permit form is submitted after the local county planning department has reviewed and signed it.

7.7 FLOODPLAINS

No mitigation measures with respect to floodplains are recommended under the No-Action Alternative, or Site Alternatives 1 and 3.

Site Alternatives 2 and 4 appear to be within a base flood plain. The lessor must ensure compliance with the requirements of the SFO as it pertains to base floodplains and consistency with Executive Order 11988.

7.8 COASTAL ZONE MANAGEMENT

No mitigation measures in relation to Coastal Zone Management are recommended for the No-Action Alternative.

For Site Alternatives 1, 2, and 3, the following mitigation measures in relation to coastal zone management are recommended for the proposed action:

- The Washington State coastal program's federal consistency coordinator should be consulted regarding review under the WDOE CZMP application process.

For Site Alternative 4, the following mitigation measures in relation to coastal zone management are recommended for the proposed action:

- The Oregon State coastal program's federal consistency coordinator should be consulted regarding review under the OCMP application process.

7.9 AGRICULTURAL RESOURCES

No mitigation measures with respect to agricultural or aquaculture resources are recommended under the No-Action Alternative or Site Alternatives 1, 2, and 3.

For Site Alternative 4, the following mitigation measures with respect to agricultural or aquaculture resources are recommended for the proposed action:

- Advance notification of the schedule for proposed in-water activities should be provided to the Hatfield Marine Science Center's Molluscan Broodstock Program, so that necessary changes, such as the frequency of water filter monitoring and replacement, could be undertaken by the Program during this period.

7.10 HAZARDOUS MATERIALS

No mitigation measures related to hazardous materials are recommended for the No-Action Alternative.

For Sites 1, 2, 3, and 4, the following mitigation measures are recommended in relation to hazardous materials and waste. It is assumed that no significant impacts would result provided that recommendations within a Phase I ESA accepted by NOAA are implemented; and that the following measures, or equivalent actions, are undertaken:

- Compliance with WDOE/ODEQ and federal RCRA hazardous waste generation and disposal, and hazardous materials use and storage notification requirements.

- Implementation of an appropriate soil/sediment handling and disposal approach, if soil/sediment on the site is disturbed.

- Implementation of an asbestos demolition survey and abatement plan for the proposed building demolitions and proposed renovations of existing buildings. This plan should address, at a minimum, the following items:

    - Compliance with all applicable local, state, and federal regulations for demolition, abatement, and disposal.

    - Asbestos abatement measures, including use of licensed and trained asbestos abatement contractors and (if necessary) encapsulation strategies to protect public health.

    - Air monitoring for worker and public safety.

    - Procedures to properly transport and dispose of potential ACM using licensed haulers and disposal facilities.

- Implementation of a lead-based paint demolition survey and abatement plan for the proposed building demolitions and proposed renovations of existing buildings. This plan should address, at a minimum, the following items:

    - Compliance with all applicable local, state, and federal regulations for demolition, abatement, and disposal,

    - Lead based paint abatement measures, including use of licensed and trained lead based paint abatement contractors,

    - Air monitoring for worker and public safety,

- Procedures to properly transport and dispose of potential lead based paint containing materials using licensed haulers and disposal facilities.

In addition, for Site Alternatives 2 and 3:

- Preparation of a hazardous materials closure plan, to address the storage of hazardous materials at the site, including any existing ASTs, and approval of this plan by the WDOE. Implementation of this plan would require, as a minimum, the following actions[4]:

  - Hazardous materials currently stored on site should be removed prior to demolition and transferred to another location.

  - Hazardous materials storage areas should be properly decontaminated.

  - Existing ASTs (if present) should be appropriately closed, emptied, decontaminated and removed in accordance with local, state and federal regulations including Washington State code WAC 173303.

  - All closure and hazardous waste disposal activities must be performed in accordance with local, state and federal regulations, including Washington State code WAC 173303 and CFR Title 40, Volume 23.

- Development of an appropriate hazardous materials storage and management plan, in compliance with WDOE Tier II Reporting (if quantities are above relevant thresholds), in relation to use and storage of hazardous materials on site, including materials related to vehicle fueling. This plan should be submitted to all appropriate agencies including the relevant County hazardous materials division.

In addition, for Site Alternatives 2, 3, and 4:

- Compliance with 40 CFR Part 112, regulating petroleum-storage tanks and mandating preparation of a Spill Prevention, Control, and Countermeasures Plan (SPCC), may be required, depending on the quantity of fuel storage planned at the site (present regulations require an SPCC Plan if greater than 1,320 gallons of petroleum products would be stored on site).

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[4] For further details see Washington Department of Ecology's *Guidance for Closure of Dangerous Waste Units and Facilities* (WDOE, 2005a).

In addition, for Site Alternative 4:

- Compliance with local, state and federal regulations and proper standards of care during removal of any hazardous materials prior to demolition, transfer of such materials to another location, and/or disposal of such materials.
- Emptying, cleaning and removal of ASTs, in accordance with proper standards of care.
- Disconnection and removal of the diesel generator in accordance with proper standards of care, to minimize the risk of diesel spills or other releases.
- Development of an appropriate hazardous materials business plan in compliance with local and state requirements including the State of Oregon Department of the Fire Marshall Tier II Reporting *Hazardous Substance Inventory Survey*, in relation to use and storage of hazardous materials on site, and fueling of vessels, if quantities exceed relevant thresholds. Depending on quantities of materials stored and wastes generated, this alternative may also be subject to the requirements of the Oregon *Toxics Use and Hazardous Waste Reduction Act.*

8 LIST OF PREPARERS

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9 LIST OF AGENCIES AND PERSONS CONTACTED

The following personnel from NOAA and the owner representatives of each Site Alternative were contacted in relation to this Environmental Assessment:

- National Oceanic and Atmospheric Administration - Jim Schell (MOC-P Environmental Protection Specialist) and James Barrows (Realty Specialist)
- Port of Bellingham - Dan Stahl (Director), Mike Stoner (Environmental Director), and Brian Gouran (Environmental Site Manager)
- Port of Newport - Don Mann (General Manager) and Pete Dale (Project Manager)
- Port of Port Angeles - Dave Hariwara (Environmental Manager)
- 1801 Fairview Avenue East LLC - Michael Denning (Managing Partner)

The following agencies and/or personnel were also contacted to obtain information used in the preparation of this Environmental Assessment. Issues were discussed in general terms only – no details of the proposed project or the project proponent were given during discussions.

- City of Newport: Greg Schecher (transportation) and James Bassingthwaite (land use)
- City of Port Angeles: Glenn Cutler and Scott Johns (transportation)
- Oregon Department of Environmental Quality: Steven (hazardous substances)
- Oregon Department of Geology and Mineral Industries: George Priest (tsunami hazard)
- Oregon State Department of Lands: (wetlands)
- Oregon Department of Transportation: Ken Lamb (transportation), Marina Orlando and Adam Roberts (air quality)
- Oregon Department of Land Conservation and Development: Ben Bailey (coastal zone management)
- Oregon Fire Marshall: (hazardous substances)
- Oregon State University: Chris Langdon (Molluscan Brood Program)
- Puget Sound Clean Air Agency: Kwame Agyei (air quality)
- Puget Sound Regional Council: Chris Peak and Kelly McGourty (air quality)
- United States Geological Survey: Nate Wood (tsunami hazard)
- Washington Department of Ecology: Sally Otterson (air quality), Debbie Nelson (toxic clean up program) and Jennifer (hazardous substances)

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Figure 13 – Proposed Site Layout: Site Alternative 3 – Bellingham
Figure 14 – Locality and Site Surroundings: Site Alternative 4 – Newport
Figure 15 – Existing Site Features: Site Alternative 4 – Newport
Figure 16 – Nautical Chart: Site Alternative 4 – Newport
Figure 17 – Proposed Site Layout: Site Alternative 4 – Newport

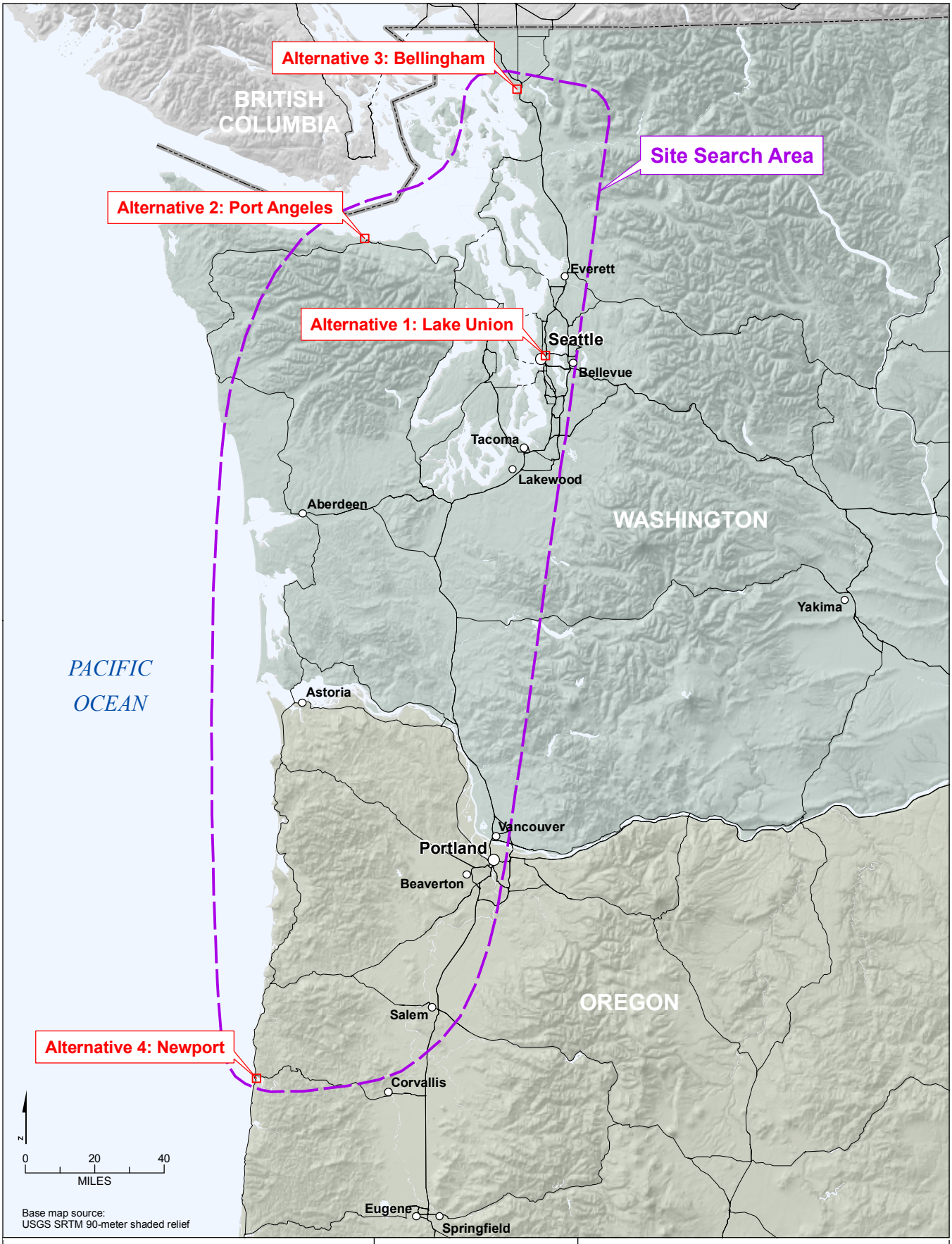

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FIGURE 1
REGIONAL SETTING

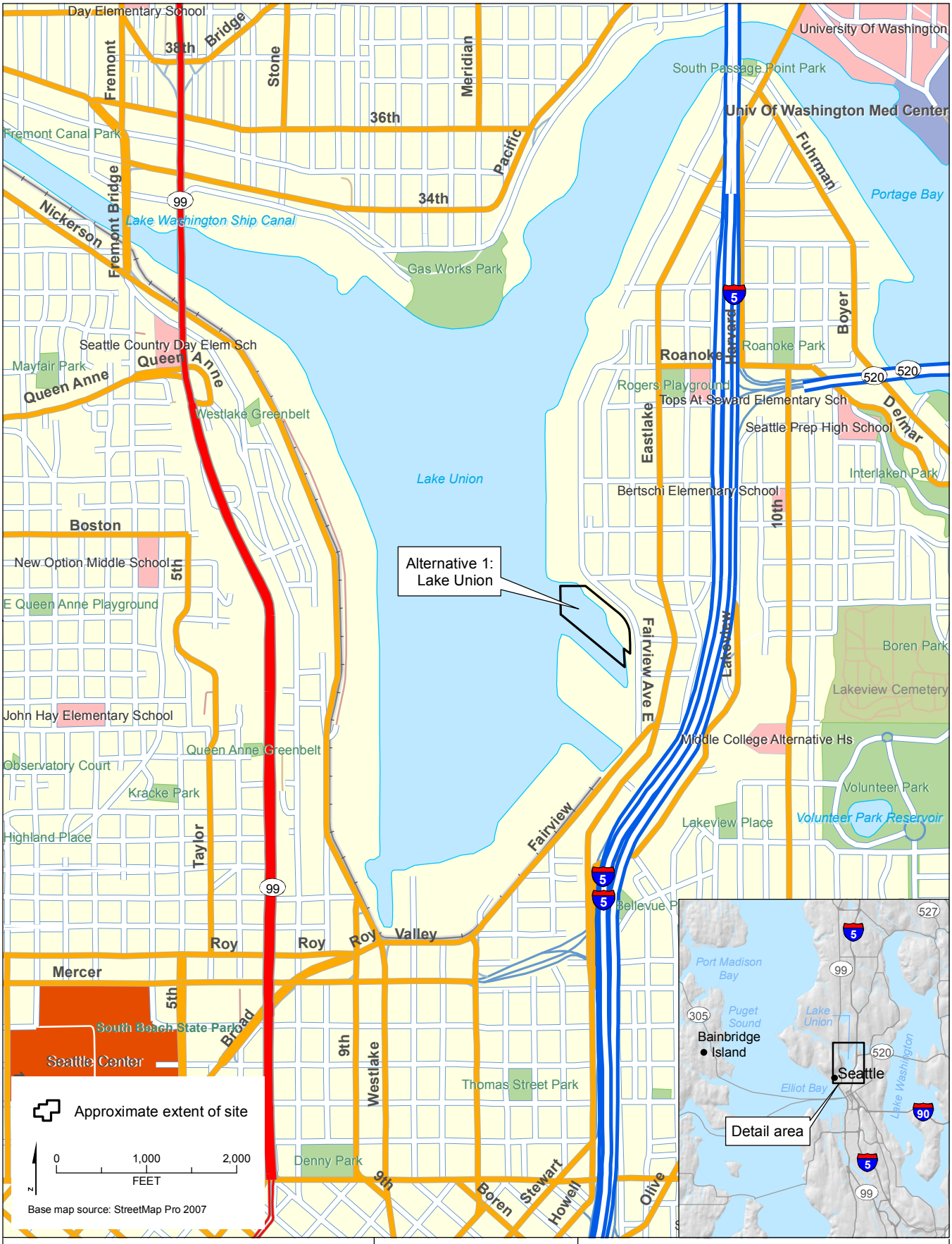

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FIGURE 2
LOCALITY AND SITE SURROUNDINGS
ALTERNATIVE 1: LAKE UNION

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FIGURE 3
EXISTING SITE FEATURES
ALTERNATIVE 1: LAKE UNION

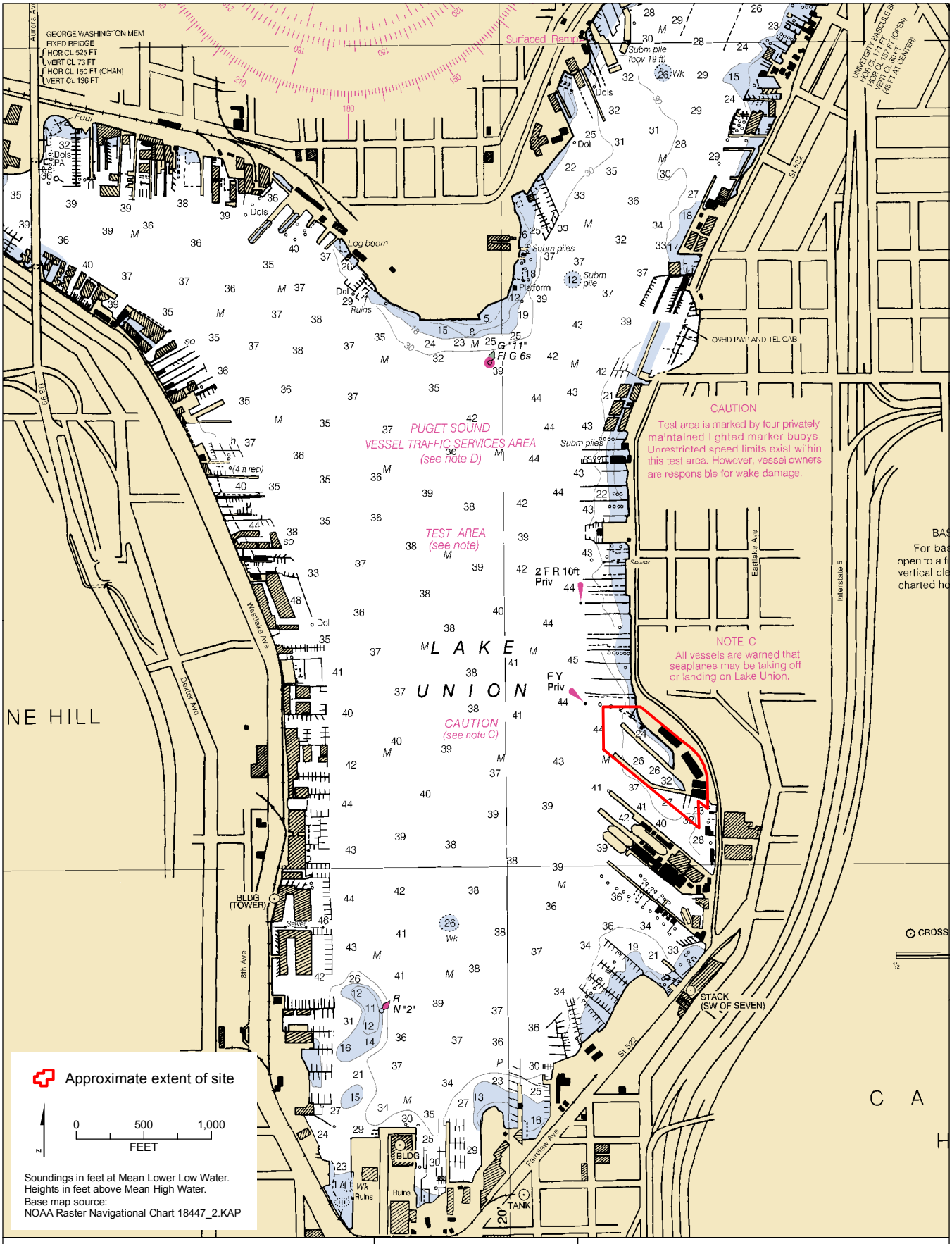

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FIGURE 4
NAUTICAL CHART
ALTERNATIVE 1: LAKE UNION

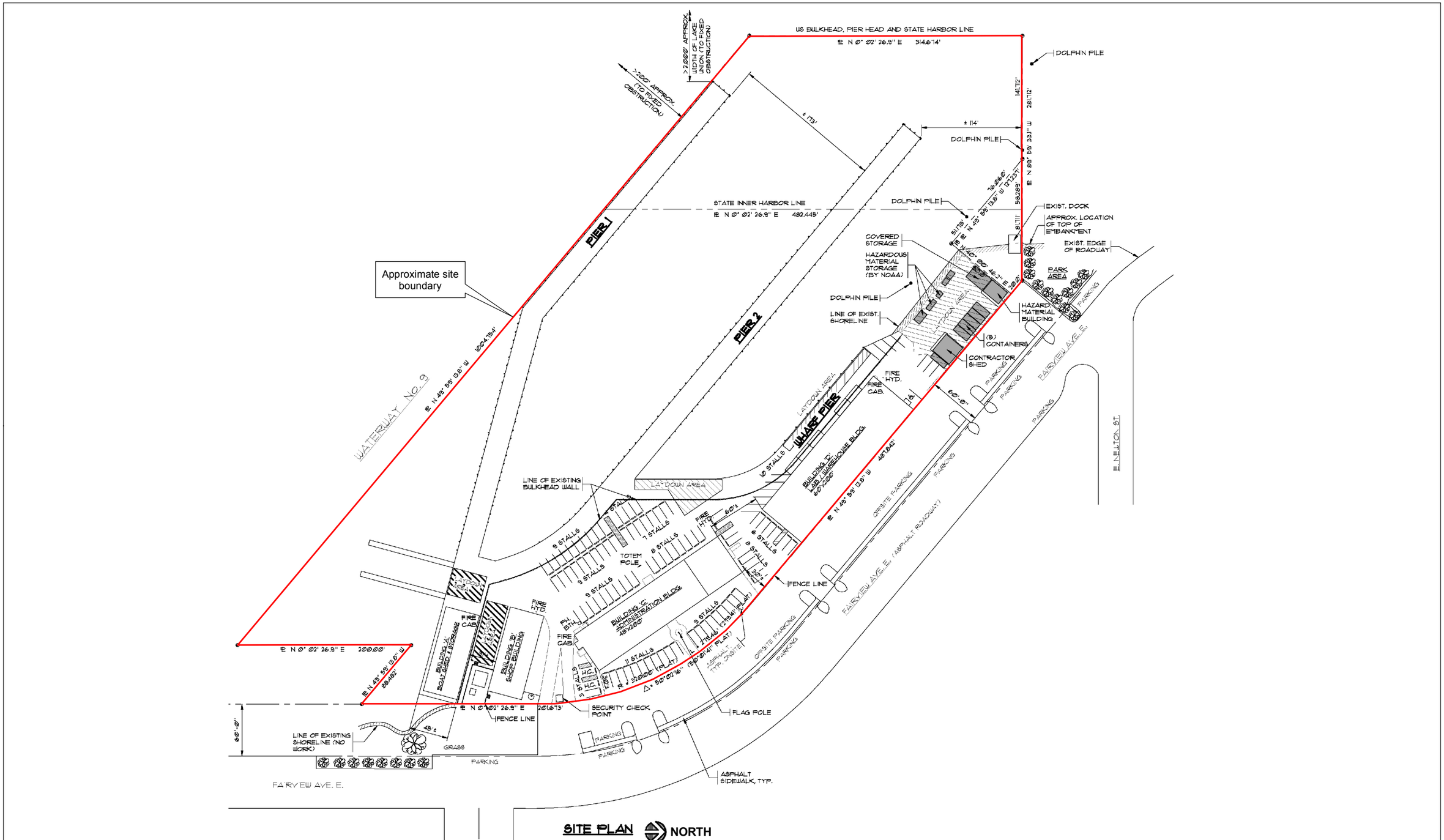

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FIGURE 5
PROPOSED SITE LAYOUT
ALTERNATIVE 1: LAKE UNION

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FIGURE 6
LOCALITY AND SITE SURROUNDINGS
ALTERNATIVE 2: PORT ANGELES

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FIGURE 7
EXISTING SITE FEATURES
ALTERNATIVE 2: PORT ANGELES

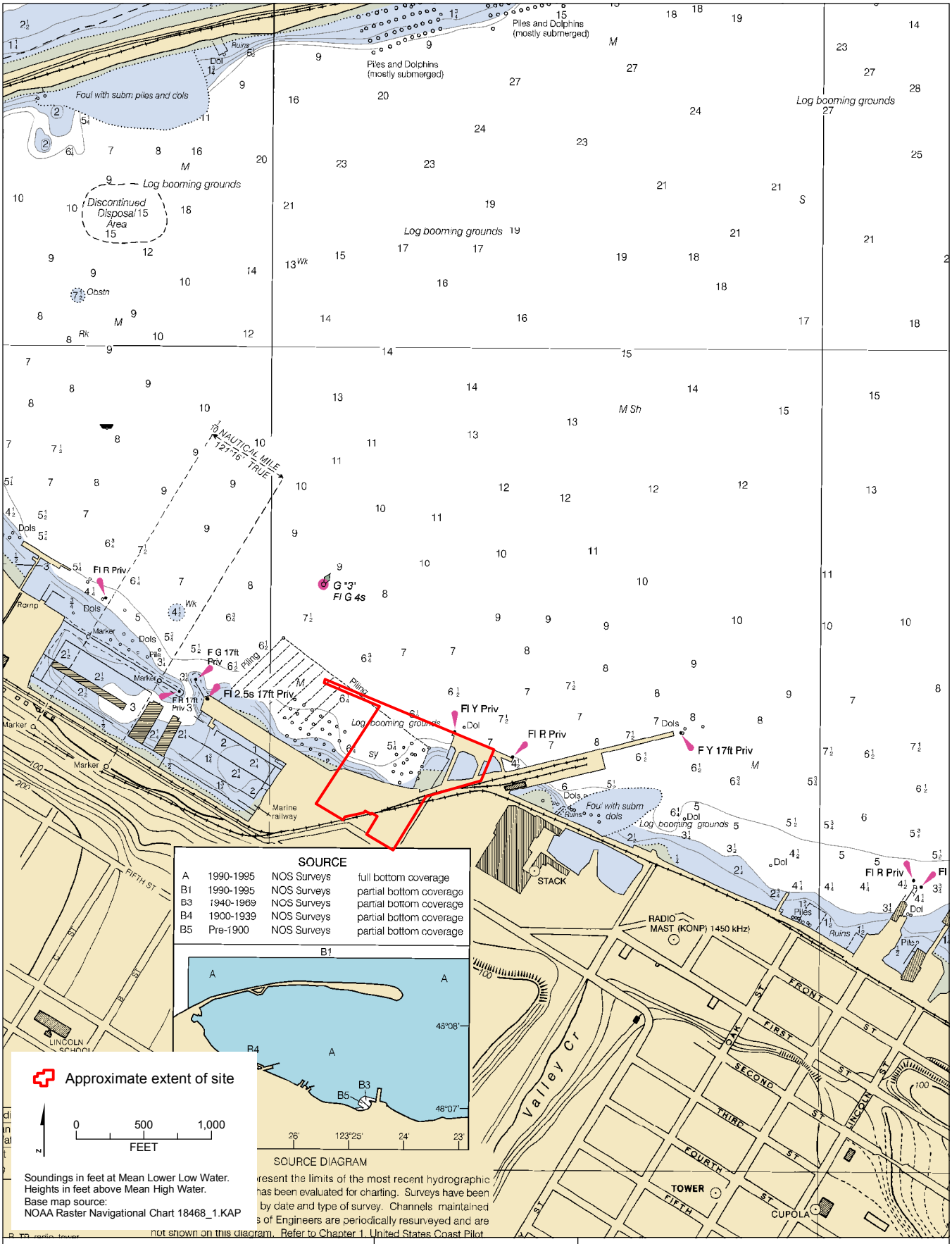

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FIGURE 8
NAUTICAL CHART
ALTERNATIVE 2: PORT ANGELES

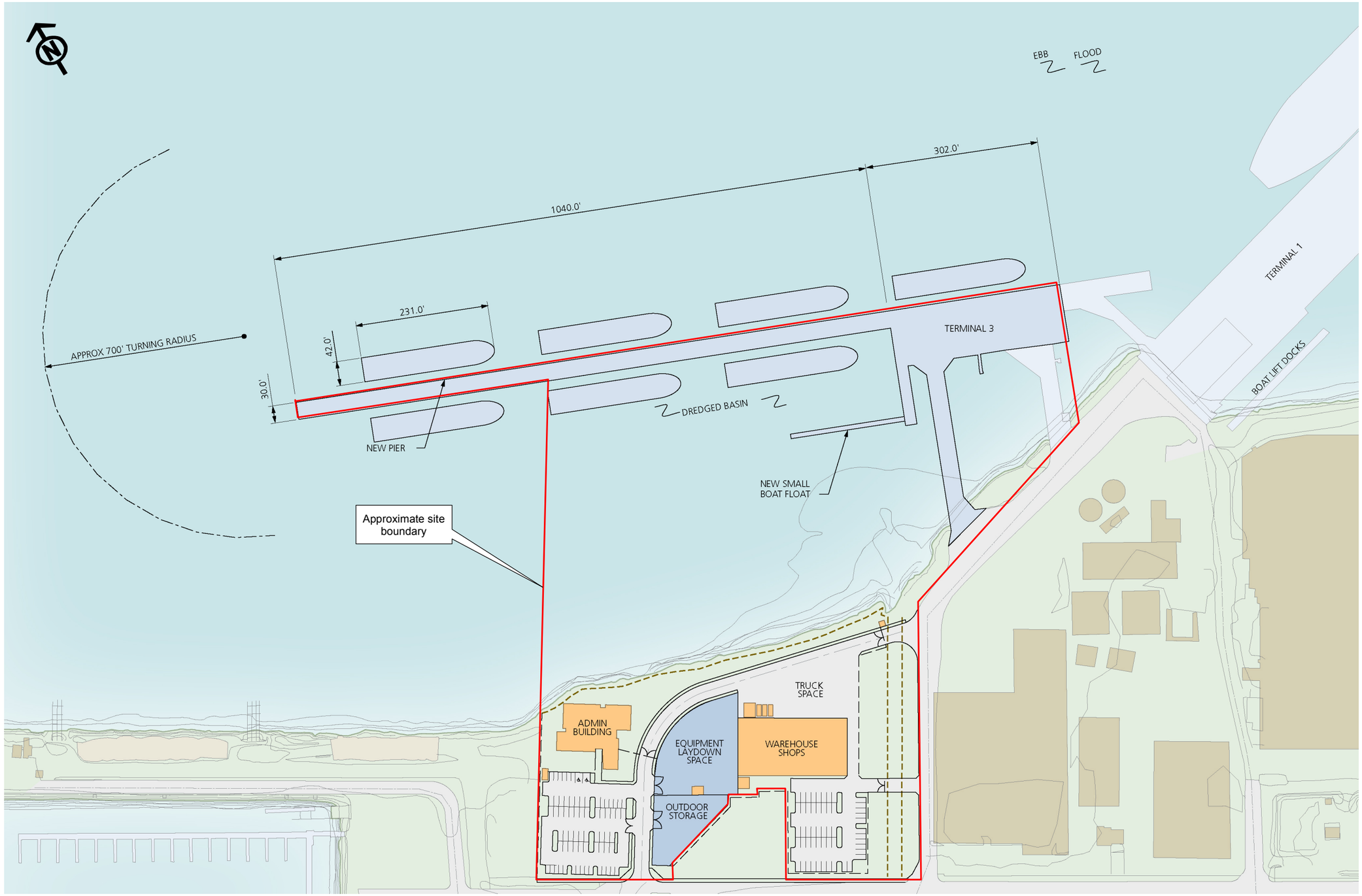

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FIGURE 9
PROPOSED SITE LAYOUT
ALTERNATIVE 2: PORT ANGELES

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FIGURE 10
LOCALITY AND SITE SURROUNDINGS
ALTERNATIVE 3: BELLINGHAM

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FIGURE 11
EXISTING SITE FEATURES
ALTERNATIVE 3: BELLINGHAM

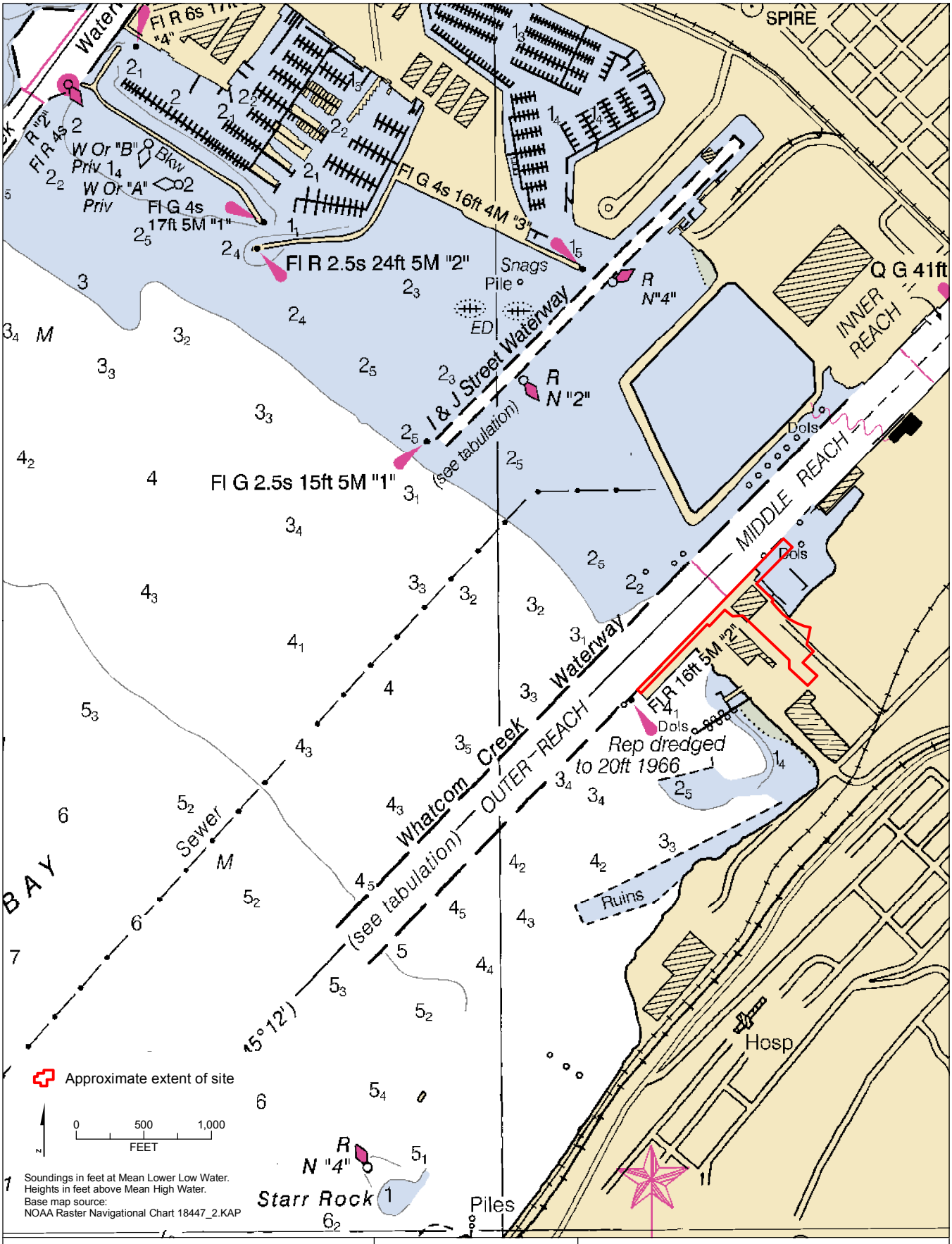

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FIGURE 12
NAUTICAL CHART
ALTERNATIVE 3: BELLINGHAM

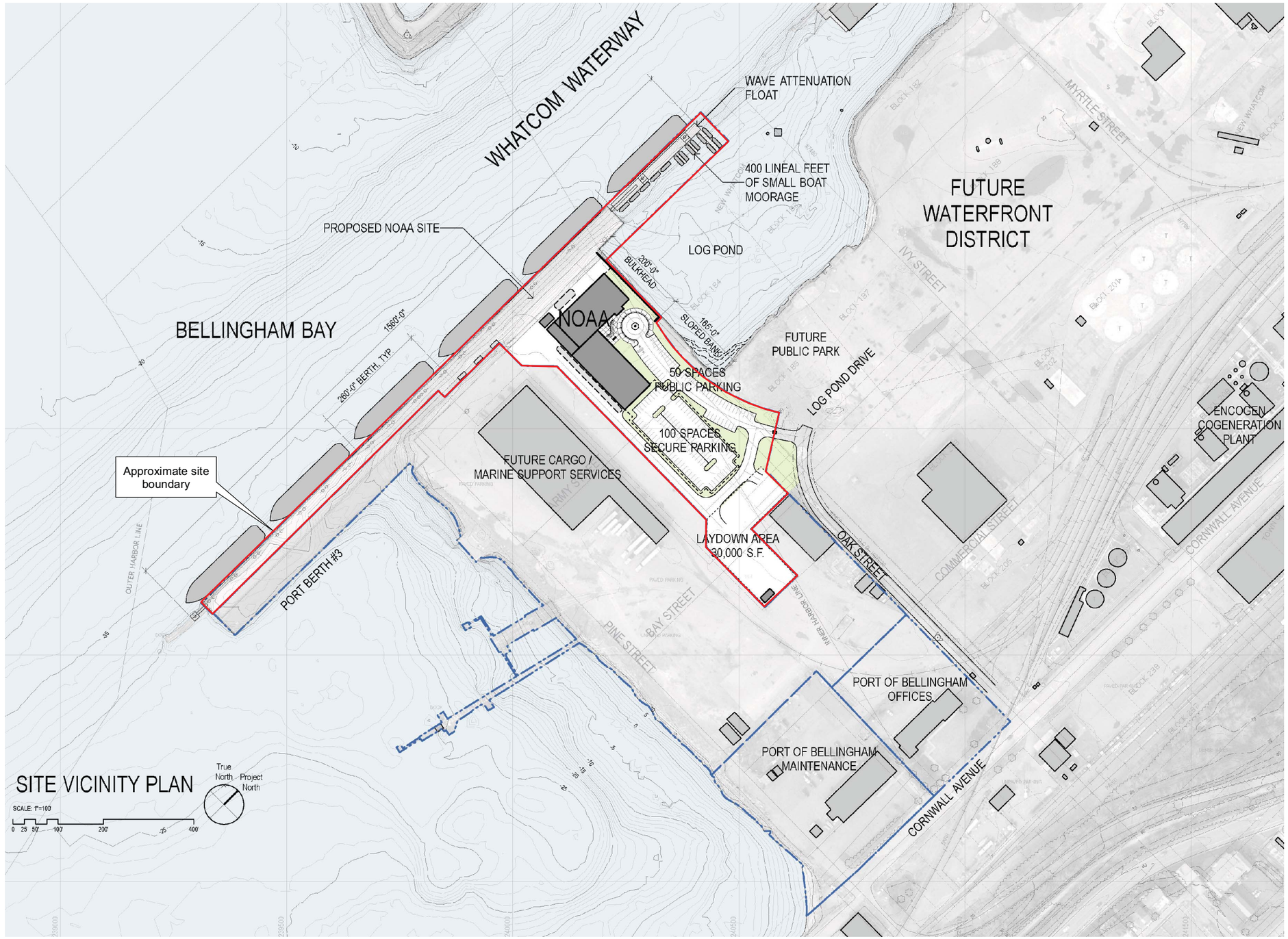

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FIGURE 13
PROPOSED SITE LAYOUT
ALTERNATIVE 3: BELLINGHAM

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FIGURE 14
LOCALITY AND SITE SURROUNDINGS
ALTERNATIVE 4: NEWPORT

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FIGURE 15
EXISTING SITE FEATURES
ALTERNATIVE 4: NEWPORT

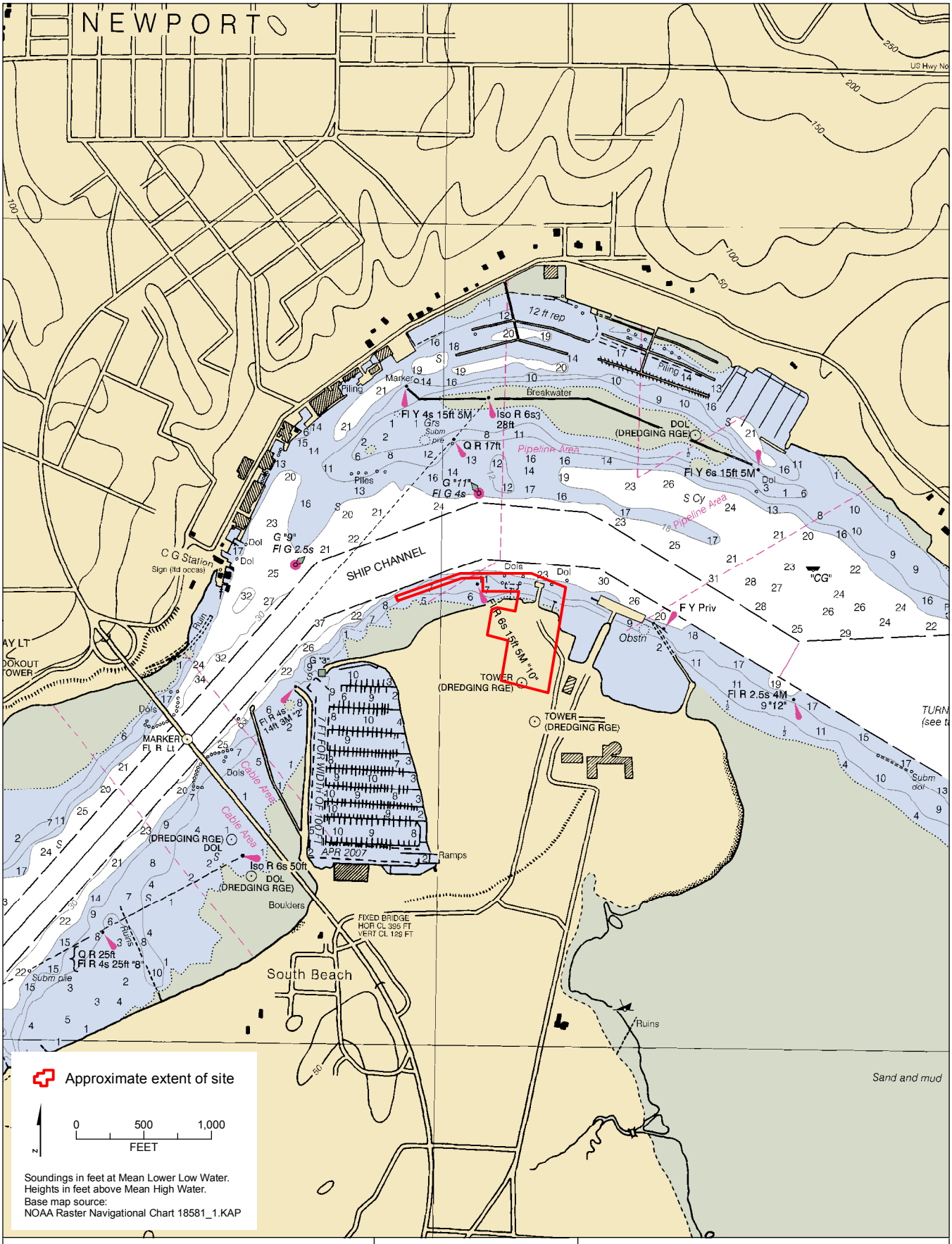

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FIGURE 16
NAUTICAL CHART
ALTERNATIVE 4: NEWPORT

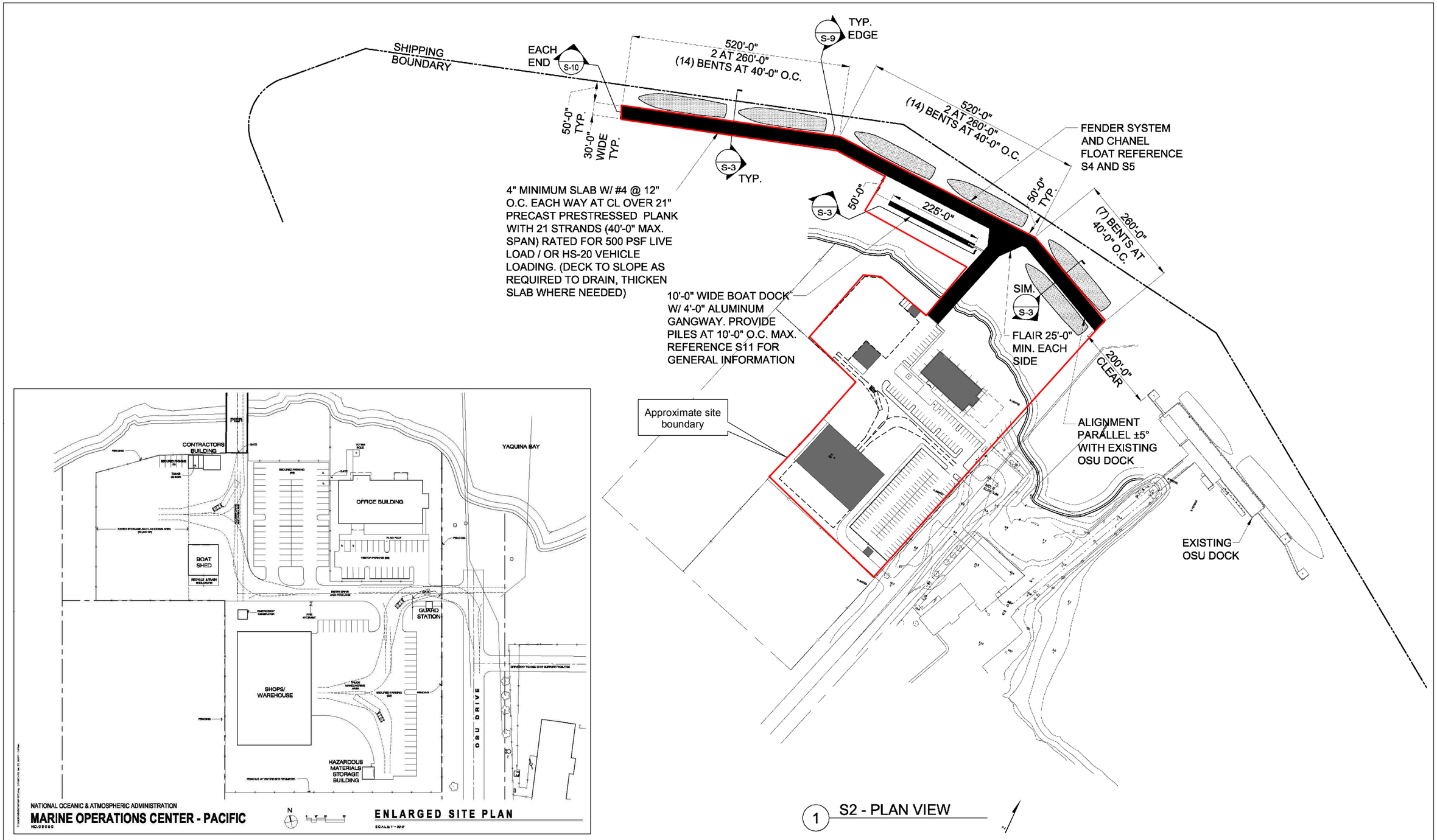

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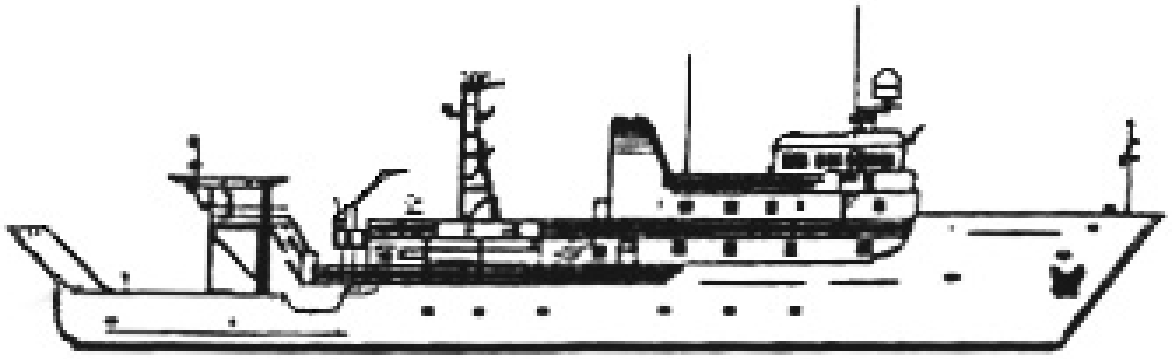
FIGURE 17
PROPOSED SITE LAYOUT
ALTERNATIVE 4: NEWPORT

Ship Specifications

- McArthur II
- Miller Freeman
- Rainier
- Bell M. Shimada (specifications not available at this time)

McARTHUR II

McARTHUR II was acquired from the U.S. Navy in 2002 and was converted by NOAA from a T-AGOS surveillance vessel to a multiple-disciplinary platform capable of a broad range of missions. As was it's predecessor, McARTHUR, **McARTHUR II** is named after William Pope McArthur. The vessel is operated by NOAA Marine and Aviation Operations (NMAO), and is home ported at NOAA's Marine Operations Center, Pacific (MOP), in Seattle, Washington.
The ship conducts oceanographic research and assessments, throughout the eastern Pacific, including the U.S. West Coast, Central and South America. **McARTHUR II** is involved in studies in several of the National Marine Sanctuaries on the west coast of the United States. The 224-foot ship engages in measurements of chemical, meteorological, and biological sampling for several large scale programs within NOAA.



Design

- Designer: Maritime Administration
- Builder: Tacoma Boatbuilding Company, Tacoma, WA
- Delivered to MSC: December 1985
- Transferred to NOAA: December 2002
- Commissioned: May 2003
- Hull Number: R330
- Call Letters: WTEJ
- Home Port: Seattle, Washington
- Length (LOA): 68.3 m (224 ft.)
- Breadth (moulded): 13.1 m (43 ft.)
- Draft, Maximum: 4.6 m (15 ft.)
- Displacement: 2,250 tons
- Gross Tonnage: 1914 tons
- Net Tonnage: 574 tons

Speed & Endurance

- Cruising Speed: 11 knots
- Range: 8,000 nmi
- Endurance: 45 days
- Endurance Constraint: Stability

Complement

- Commissioned officers: 5
- Licensed engineers: 4
- Crew: 13
- Scientists: Up to 15

Food Service Seating Capacity

- Crew's mess: 16

Berthing

- Single staterooms: 18
- Double staterooms: 8
- Quadruple staterooms: 1
- Total bunks: 38

Medical Facilities

- Emergency and first-aid equipment, administered by trained vessel personnel.

Cranes and Booms

- Telescoping Boom
  - Quantity: 1
  - Manufacturer: North American Crane Equipment
  - Boom length (extended): 32 ft.
  - Location: 01 Deck – aft
  - Lifting capacity (boom extended): 2,030 lbs
- Boat Davit
  - Quantity: 1
  - Manufacturer: Allied Systems Co.
  - Boom length: 22 ft.
  - Location: 02 deck - Starboard aft
  - Safe working load: 5,300 lbs.
- Rescue Boat Crane
  - Quantity: 1
  - Manufacturer: Schat-Marine Safety Corporation
  - Location: 02 Deck - Port aft
  - Safe Working Load: 4,720 lbs.

Winches

- Oceanographic Winch
  - Quantity: 1
  - Manufacturer: Markey
  - Drive: Electrohydraulic
  - Line Speed: 50-60 m/min
  - Maximum Drum Capacity: 6,000 m of 0.322" conducting cable (3 conductor)
  - Maximum Pull, Low Speed: 12,000 lbs.
  - Maximum Pull, High Speed: 8,000 lbs.
  - Maximum Working Load: 5,000 lbs.
  - Recommended Work Load: 2,000 lbs.
- Type: Winch
  - Quantity: 1
  - Drive: Electrohydraulic
  - Line speed: 38-46 m/min.
  - Maximum Drum Capacity: 3000 m of 1/4" wire
  - Currently Rigged With: 1,500 m of 1/4" stainless steel wire
  - Safe Working Load (SWL): 1,220 lbs.

A-Frame

- Type: Movable
  - Quantity: 1
  - Location: Stern
  - Clearance overside: 8 ft.
  - Useable width: 8 ft. 2 in.
  - Vertical clearance (deck to pad eye): 9 ft. 8 in. at maximum extension forward
  - Lifting capacity: 8,000 lbs.

Ground Tackle

- Bower Anchors
  - Quantity: 2
  - Type: Baldt Stockless
  - Weight: 3500 lbs. each.
- Anchor Chains
  - Quantity: 2
  - Length:
    - Port - 8 shots = 720'
    - Starboard - 7 shots =630'

Small Boats

- 21 foot Rigid Hulled Inflatable Boat (RHIB)
  - Quantity: 1
  - Manufacturer: Zodiac
  - Engine: Yamaha 130 hp gasoline (outboard)
  - Note: carries Garmin GPS unit and fathometer
- 18 foot Rigid Hulled Inflatable Boat (RHIB)
  - Quantity: 1
  - Manufacturer: Willard
  - Engine: Johnson 20 hp gasoline (outboard)

Note: Gasoline storage capacity aboard is 490 gallons

Engineering

General

- Cruising Speed: 11 knots
- Range: 8000 nmi
- Power: 1600 HP
- Fuel Capacity: 224,000 gallons
- Fuel Consumption: 110 gal/hr
- Fuel Type: #2 Diesel
- Endurance: 45 days
- Endurance Constraint:Stability

Propulsion Plant

- Main Propulsion
  - Type: Diesel Electric
  - Quantity: 2
  - Manufacturer: General Electric
  - Rated power (each): 800 hp
- Propellers
  - Type: Fixed Pitch
  - Quantity: 2
  - Diameter: 8.5 ft.
  - Blades: 4 manganese bronze
- Bow Thruster
  - Type: Tunnel Thruster
  - Quantity: 1
  - Manufacturer: General Electric/Harbor Master
  - Rated power: 550 hp
  - Pitch: fixed
  - Blades: 4

Freshwater System

- Storage capacity:
  - Main - 4,063 gal.
  - Reserve - 1,035 gal.
- Normal consumption: 2,500 gal./day with scientists on board
- Desalinator
  - Quantity: 2
  - Type: Evaporator
  - Manufacturer: Alfa Laval
  - Maximum production: 3,000 gal./day (each)

Pollution Control

- Sewage Waste Control
  - Type: Collection, Holding & Transfer
  - Manufacturer: Omnipure
  - Holding Capacity: 6000 gallons
- Oily Waste Control
  - Type: Oily Water Separator
  - Manufacturer: World Water System
  - Holding Capacity:25 gallons
  - Process Rate: 2 gallons per minute
  - Capability: less then 100 ppm

Electrical System

- Ship Service Generator
  - Quantity: 4
  - Manufacturer: Caterpillar/Kato
  - Power Rating: 600 kW
- Emergency Generator
  - Quantity: 1
  - Manufacturer: Caterpillar/Kato
  - Power rating: 250 kW

Communications

- VHF-FM Marine Band Transceivers
- HF Marine Band Transceivers
- HF Alarm Watch Radio Receiver (2182 kHz)
- INMARSAT Standard B Radio Transceiver
- Radio Teletype Capability
- NAVTEX Receiver
- Cellular Telephone
- Emergency Position Indicator Radio Beacons (Class 1 and Mini-B)
- Search and Rescue Transponders (X-Band Radar Frequency)
- E-mail (E-mail Address: Noaa.Ship.McArthur@noaa.gov)

Navigation

- Gyro compass: Sperry MK227 gyro
- Global Positioning System (GPS)
- Nobeltec's Visual Navigation Suite
- Traditional paper charts
- Radar: Furuno ARPA Consoles (2)
  - One X-band
  - One S- band with chart overlay
- NAVTEX receiver (519 kHz)
- Weather Fax

Scientific Refrigerators and Freezers

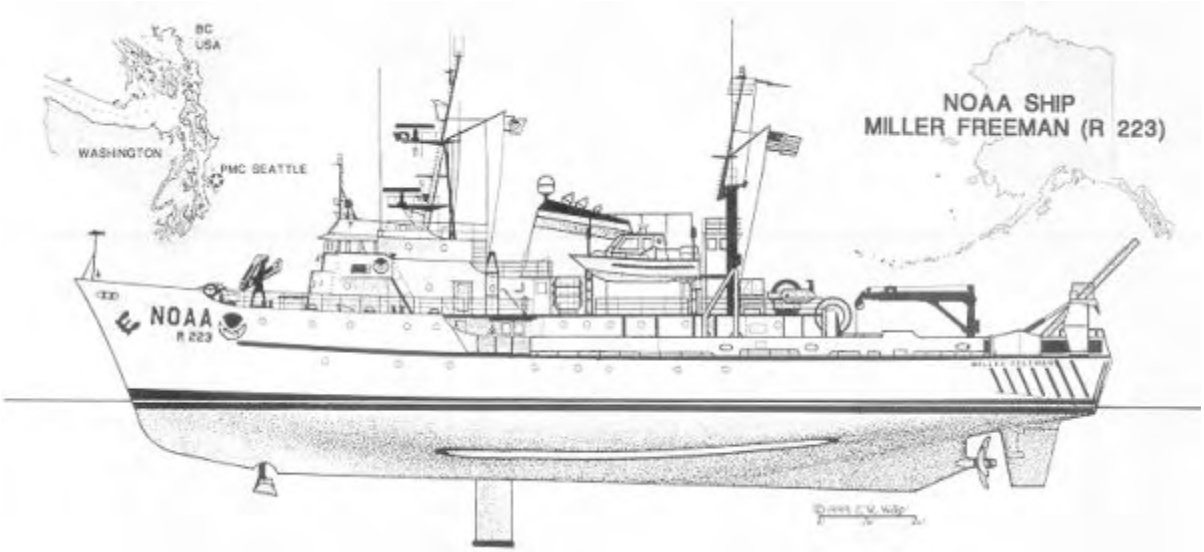
- Wet Lab Freezer
  - Manufacturer: Kenmore
  - Volume: 32 cu. ft.
  - Capacity: -10 °F
- Oceo lab refrigerator
  - Manufacturer: RSP Ind.
  - Volume: 10 cu. ft.
- Dry lab freezer
  - Manufacturer: Whirlpool
  - Volume: 21.7 cu. Ft.
  - Capacity: -10 °F

Scientific Equipment

- Computers
  - Two Dell PowerEdge 2650 computers running Windows 2000 and Scientific Computer System (SCS) software
  - Can handle data in:
    - Raw Binary,
    - ASCII,
    - UNIX
    - post-processed compressed or merged data sets
- Bathymetric
  - Echo Sounder: Abyss IES-10 Echo sounder (12 kHz and 200 kHz)
- Meteorological
  - Barometer : One Atmospheric Instruments digital barometer. Data is output in millibars and is recorded on SCS
- Oceanographic
  - Autosalinometer: One Guildline model 8400 autosalinometer capable of precision salinity calculation.
  - CTD: One Seabird Electronics Model 9/11 Plus CTD system with SBE-32 12-position carousel water sampler. The SBE 9 Plus underwater assembly has a depth capacity of 6800 meters and a conductivity/temperature sensor pair.
  - Thermosalinograph (TSG):The Seabird Electronics SBE-45 thermosalinograph is plumbed into the Wet Lab and measures the conductivity and temperature of the water. The hull intake is 3 meters below the water line
  - Expendable Bathythermograph (XBT): Installed a Sippican MK-12 XBT system with a portable launcher that is available for scientific use. The user must supply XBT probes.

MILLER FREEMAN

MILLER FREEMAN is a 215-foot fisheries and oceanographic research vessel and is one of the largest research trawlers in the United States. **MILLER FREEMAN's** primary mission is to provide a working platform for the study of the ocean's living resources. The ship is named for Miller Freeman (1875-1955), a publisher who was actively involved in the international management of fish harvests. The ship was launched in 1967, but not fully rigged until 1975. The vessel was again re-rigged in 1982. **MILLER FREEMAN** is homeported in Seattle, Washington, at the Marine Operations Center.



Line Drawing by Bob Hitz

Design

- Designer: Philip F. Spaudling
- Builder: American Shipbuilding, Toledo, OH
- Launched: 1967
- Delivered: June, 1967
- Laid up 5 years; recommissioned: 1974
- Hull Number: R223
- Call Letters: WTDM
- Home Port: Seattle, Washington
- Length (LOA): 65.5m (215 ft.)
- Breadth (moulded): 12.8m (42 ft.)
- Draft, Maximum: 6.4m (21.0 ft.)(with Centerboard up)
- Draft, Maximum: 9.8m (32.0 ft.)(with Centerboard down)
- Hull: Welded steel
- Displacement: 1,920 tons
- Gross Tonnage: 1,515
- Net Tonnage: 680

Speed & Endurance

- Cruising Speed: 11 knots
- Range: 12,582 nmi
- Endurance: 31 days
- Endurance Constraint: Fuel

Complement

- Commissioned officers: 7
- Licensed Engineers: 4
- Crew: 23
- Scientists: 11 (max)

Food Service Seating

- Wardroom: 16
- Crew's mess: 16

Berthing

- Single Person Staterooms: 4
- Two Person Staterooms: 21
- Four Person Staterooms: 1
- Total Berths: 50

Medical Facilities

- Emergency and first-aid equipment aboard administered by an EMT.

Scientific Laboratory Facilities

- Fish Processing Lab 300 sq. ft.
- Rough Lab 240 sq. ft.
- Ocean Chemistry Lab 170 sq. ft.
- Wet Lab 300 sq. ft.
- Data Plot 220 sq. ft.
- Autosalinometer Room 50 sq. ft.
- Acoustics Lab 152 sq.

Winches

- Type: Markey
  - Location: 1 each, port strb
  - Safe Working Load: 1,150 lbs
- Type: Marco
  - Location: aft
  - Safe Working Load: 3,550 lbs
- Type: Rowe
  - Location: aft
  - Safe Working Load: 3,300 lbs
- Type: Sea-Mac
  - Location: aft
  - Safe Working Load: 3,300 lbs
- Type: Rapp-Hydema Trawl Winch
  - Quantity:2
  - Safe Working Load: 22,000 lbs
- Type: Net Reels
  - Quantity: 2
  - Safe Working Load: 18,000 lbs
- Type: Lantec
  - Location: 1 each, port, strb
  - Safe Working Load: 23,000 lbs
- Type: Haulout
  - Safe Working Load: 40,700 lbs

Cranes

- Appleton Crane
  - Quantity: 2
  - Lift: 8,500 lbs
  - Wire size: 5/8”
  - Range: 50’ max, 360 degree range
  - Location: 1 each, Port and Starboard
- HAIB Crane
  - Quantity: 1
  - Lift: 2,750 lbs
  - Wire size: 1/2”
  - Range: 27 feet
  - Location: Bow

A-Frames

- Trawl Gantry
  - Location: Aft
  - Height: 29’
  - Extension: 4.5’ aft, 6.0’ fwd
- Oceo
  - Quantity: 2
  - Location: Port, Starboard
  - Height: 14.5’
  - Extension: 4.5’ outboard

Boats

- Ambar Rescue Boat
  - RHIB, 5 person capacity
  - Cummungs 130 hp diesel engine
  - Hamilton jet inboard (40mph)
- Munison Launch
  - 26’ Hammerhead, 9 person capacity
  - CAT 3208, 185 HP engine (21 kts)
- Zodiac 15’ inflatable
  - 25 hp Outboard motor

Engineering

General

- Cruising Speed: 11 knots
- Range: 12,582 nmi
- Power: 1,950 SHP
- Fuel Capacity: 142,000 gallons at 95%
- Fuel Consumption: 2,200 gallons/day average
- Fuel Type: #2 Diesel
- Endurance: 31 days
- Endurance Constraint: Fuel

Propulsion Plant

- Main Propulsion
  - Type: Geared diesel
  - Quantity: 1
  - Manufacturer: General Motors
  - Rated power: 2,200 hp
- Propeller
  - Type: Controllable Pitch
  - Quantity: 1
  - Manufacturer: Bird Johnson
  - Diameter: 10.1 ft.
  - Blades: 4
- Auxiliary Propulsion
  - Type: Lowerable Omnidirectional Bow Thruster
  - Quantity: 1
  - Manufacturer: Schottle
  - Drive: Electric
  - Rated Power: 400 hp

Fresh Water System

- Storage capacity: 7,350 gal
- Normal consumption: 2,000 gal./day
- Maximum production: 2,400 gal./day
- Evaporators
  - Type: Maxim Heat Recovery
  - Quantity: 2
  - Manufacturer: Beaird Industries, Inc.

Pollution Control

- Sewage Waste Control
  - Type: Electrocatalytic
  - Manufacturer: Sigma-Chapman, Inc.
  - Holding Capacity: 6178 gallons
- Grey Water Holding Capacity: 7216 gallons
- Oily Waste Control
  - Type: Oily Water Separator
  - Manufacturer: SRS
  - Holding Capacity: 6440 gallons
- Incinerator (dry trash)
  - Type: DG-120 (diesel)
  - Manufacturer: Kbaerner-Gloar

Electrical System

- Ship Service Generators
  - Quantity: 2
  - Manufacturer: Caterpillar
  - Output Voltage: 450 VAC, 60 Hz, 3Ø
  - Power Rating: 600 kW
- Emergency Generator
  - Quantity: 1
  - Manufacturer: Caterpillar/GE
  - Output Voltage: 450 VAC, 60 Hz, 3Ø
  - Power Rating: 100 kW
- Electrical Service
  - 450 VAC, 3Ø
  - 220 VAC, 1Ø (limited availability)
  - 120 VAC, 1Ø
  - 120 VAC, 1Ø clean, uninterruptible power for scientific equipment

Communications

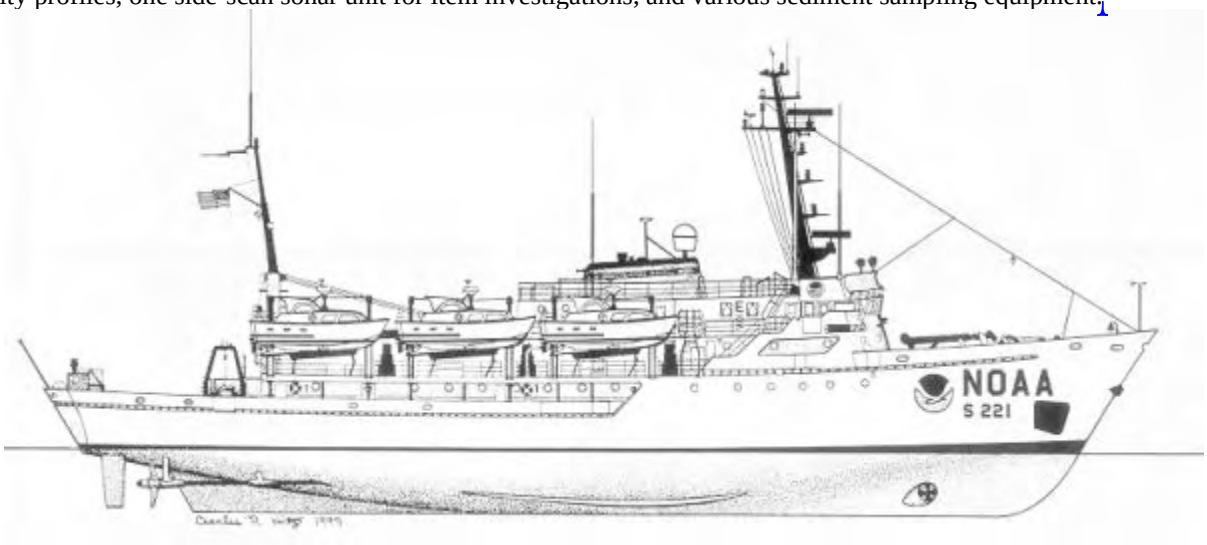
- Satellite Systems:
  - INMARSAT-B: Magnaphone MX-2464 INMARSAT-B, Voice, Data at 56/64 Kbytes
  - INMARSAT Mini M: Nera Worldphone Mini M, voice or 2400 baud data
  - INMARSAT Standard C: Trimble Galaxy, Telex type 500 baud data.
- Cell Phone
- High Frequency SSB Radio (SEA 330): Two 300 watt high frequency (HF, 2 tro 30 mhz)
- Global Maritime Distress and Safety System (GMDSS)
- E-mail (E-mail Address: Noaa.Ship.Miller.Freeman@noaa.gov)

Navigation

- Gyro compass: Sperry MK 37 Gyrocompass
- GPS
  - Two Leica MX412 DGPS
  - Trimble P-Code receiver
  - Northstar 941X 12-channel DGPS receiver
- Backup GPS
  - Trimble INMARSAT-C unit
  - Northstar 941 6-channel DPGS
- Navigation Nobeltec's Visual Navigation Suite
- Traditional paper charts
- Radar:
  - Raytehon X-ban (3 cm) radar with ARPA display
  - S-band (10 cm) radar that incorporates gyro information.
- Ametek Doppler Speed Log
- NAVTEX GMDSS 518 KHz
- Weather fax

RAINIER

NOAA Ship RAINIER is designed and outfitted primarily for conducting hydrographic surveys in support of nautical charting. Scientific equipment normally aboard is limited to equipment that supports these survey operations. The ship operates off the U.S. Pacific Coast, and in Alaskan coastal waters. **RAINIER** is named for Mount Rainier. **RAINIER** is equipped with an intermediate depth multibeam swath survey system. She carries six aluminum survey launches ~~equipped with multibeam swath and single beam echo sounders and a hydrographic data acquisition system.~~ She also has three small boats providing support to shore stations and dive operations. ~~Seven crew members are trained as certified NOAA divers.~~ Other equipment to support hydrographic survey operations includes ~~five CTDs used for sound velocity profiles, one side-scan sonar unit for item investigations, and various sediment sampling equipment.~~



Line Drawing by Bob Hitz

Design

- Designer: Maritime Administration
- Builder: Aerojet-General Shipyards, Jacksonville, FL
- Launched: March 1967
- Delivered: April 1968
- Commissioned: October 1968
- Hull Number: S 221
- Call Letters: WTEF
- Home Port: Seattle, WA
- Length (LOA): 70.4 m (231 ft.)
- Breadth (moulded): 12.8 m (42 ft.)
- Draft, Maximum: 4.4m (14.3 ft.)
- Hull: Welded steel/ice strengthened
- Displacement: 1,800 tons
- Gross Tonnage: 1,591
- Net Tonnage: 578

Speed & Endurance

- Cruising Speed: 12 knots
- Range: 5,898 nmi
- Endurance: 22 day
- Endurance Constraint: Stability

Complement

- Commissioned Officers: 10
- Licensed Engineers: 4
- Crew: 35
- Scientists: 4 (Max)

Food-Service Seating

- Wardroom: 12
- Ship's Officers Mess: 11
- Technicians Mess: 18
- Crew's Mess: 18

Berthing Capacity

- Single staterooms: 5
- Double staterooms: 18
- Four bunk rooms: 9
- Total bunks: 79

Medical Facilities

- Emergency and first-aid equipment aboard, administered by trained vessel personnel.

Scientific Laboratory Facilities

- Dry Oceanographic lab: 240 sq. ft.

Diving Equipment

- Onboard dive air compressor
- 17 SCUBA tanks
- 7 NOAA certified divers

Cranes and Booms

- Telescoping Boom Crane
  - Quantity: 2
  - Manufacturer: Skagit
  - Drive: Electrohydraulic
  - Location: Foredeck, Port and Starboard
  - Boom length: 25 ft.
  - Lifting capacity: 2,500 lbs (boom extended)
- Fixed Length Crane
  - Quantity: 1
  - Manufacturer: Skagit
  - Drive: Electric
  - Location: Aft Mast
  - Boom length: 40 ft.
  - Lifting capacity: 5,000 lbs

Winches

- Oceanographic Winch
  - Manufacturer: Northern Line
  - Drive: Electrohydraulic
  - Location: Main Deck, Starboard Quarter
  - Line speed: 0-400 ft./min.
  - Maximum pull: 1,000 lbs.
  - Drum capacity: 30,000 ft. of 3/16 in. wire rope

A-Frame

- Type: Movable
  - Quantity: 1
  - Drive: Electrohydraulic
  - Location: Main Deck, Strb. Qtr.
  - Clearance over side: 3 ft.

Ground Tackle

- Bower Anchor
  - Quantity: 2
  - Type: Stockless
  - Weight: 4,850 lbs
- Anchor Chain
  - Quantity: 2
  - Size and type: 1 3/8 inch stud link
  - Length: 165 fathoms

Launches and Small Boats

- Aluminum Survey Launch
  - Quantity: 4
  - Manufacturer: The Boatyard (Jensen)
  - Length: 29 ft.
  - Propulsion: Diesel
  - Special Features: Power isolation protection for scientific equipment.
- Aluminum Survey Launch
  - Quantity: 1
  - Manufacturer: The Boatyard (Jensen)
  - Length: 29 ft.
  - Propulsion: Diesel/Jet Drive
  - Special Features: Power isolation protections for scientific equipment.
- Aluminum Survey Launch
  - Quantity: 1
  - Manufacturer: American Eagle (Munson)
  - Length: 29 ft.
  - Propulsion: Diesel/Hamilton Jet Drive
  - Special Features: Power isolation protections for scientific equipment.
- Aluminum Open Boat
  - Quantity: 1
  - Manufacturer: SeaArk
  - Length: 19 ft.
  - Propulsion: Gasoline Outboard
- Aluminum Open Boat
  - Quantity: 1
  - Manufacturer: MonArk
  - Length: 17 ft.
  - Propulsion: Gasoline Outboard
- Aluminum SAFE Boat
  - Quantity: 1
  - Manufacturer: American Eagle
  - Length: 19 ft.
  - Propulsion: Gasoline Outboard
- Inflatable Open Boat
  - Quantity: 1
  - Manufacturer: Zodiak
  - Length: 13 ft.
  - Propulsion: Gasoline Outboard

Engineering

General

- Cruising Speed: 12 knots
- Range: 5,898 nmi
- Power: 2,400 hp
- Fuel Capacity: 107,000 gal.
- Fuel Consumption: 120 gal./hr.
- Fuel Type: #2 diesel
- Endurance: 22 days
- Endurance Constraint: Stability

Propulsion Plant

- Main Propulsion
  - Type: Geared Diesel
  - Quantity: 2
  - Manufacturer: General Motors EMD
  - Rated power (each): 1,200 hp
- Propellers
  - Type: Controllable Pitch
  - Quantity: 2
  - Diameter: 8.5 ft.
  - Blades: 3
- Auxiliary Propulsion
  - Type: Through Hull Bow Thruster
  - Quantity: 1
  - Manufacturer: Detroit Diesel/Bird Johnson
  - Drive: Geared
  - Rated Power: 200 hp

Freshwater System

- Storage capacity: 16,000 gal.
- Normal consumption: 3,500 gal/day
- Evaporators
  - Quantity: 2
  - Type: Waste Heat/Evaporative Distillers
  - Manufacturer: Alpha Lavel
  - Maximum Production: 7,000 gal/day

Pollution Control

- Sewage Waste Control
  - Type: Electrocatalytic
  - Manufacturer: Sigma Chapman Inc.
  - Holding Capacity: 8,000 gal
- Oily Waste Control
  - Type: Oily water separator
  - Manufacturer: SRS
  - Holding Capacity: 1,700 gal

Electrical System

- Ship Service Generator
  - Quantity: 2
  - Manufacturer: Detroit Diesel/GE
  - Output Voltage: 450 VAC, 60 Hz, 3Ø
  - Power Rating: 300 kW
- Emergency Generator
  - Quantity: 1
  - Manufacturer: Detroit Diesel/GE
  - Output Voltage: 450 VAC, 60 Hz, 3Ø
  - Power Rating: 75 kW
- Electrical Service
  - 450 VAC, 3Ø
  - 120 VAC, 3Ø
  - 120 VAC, 1Ø
  - 120 VAC, 1Ø uninterruptible power for scientific equipment.

Communications

- VHF-FM Marine Band Transceivers
- ~~HF~~ Marine Band Transceivers
- HF Alarm Watch Radio Receiver (2182 kHz)
- Radio Teletype Capability
- ~~Weather Facsimile Receiver~~
- NAVTEX Receiver
- Cellular Telephone
- Portable VHF-FM transceivers
- INMARSAT Standard B Radio Transceiver
- INMARSAT Standard C Radio Transceiver
- Emergency Position Indicator Radio Beacons ~~(Class 1 and Mini-B)~~
- Search and Rescue Transponders (X-Band Radar Frequency)
- E-mail (RAINIER's E-mail address is: NOAA.Ship.Rainier@noaa.gov)

Navigation

- ~~X~~ Band Radar with an ARPA display.
- Differential Global Positioning System (DGPS) Receivers
- Electronic Chart Navigation System (ECS)
- Gyrocompass
- ~~Tides and Currents Prediction Software~~

Scientific Equipment

- Sea-Bird Electronics, Inc. SBE 19, SEACAT CTD Profilers
- Shipboard Environmental *Data* Acquisition System (SEAS)
- Air and Seawater Temperature Sensors
- ~~Pentium Pro 200 MHz PC's with Windows 98 operating system~~
- Power isolation protection for scientific equipment.

Survey Equipment

- CSi FBX-2 Radio Beacon Receiver
- CSi MBX-2 Radio Beacon Receiver
- Knudsen ~~Engineering Limited 320M Marine Echosounder~~
- RESON 8101 ~~SONAR Processor~~
- SeaBeam 1050 D MKII
- SeaBeam 1180
- Trimble DSM212L
- TSS Position and Orientation System POS/MV
- TSS Motion Sensor Type 335B
- TSS 333/335 H-R-P Sensor Active Junction Box
- SeaBird Electronics SBE 19 SEACAT CTD Profilers
- Monitor Repeaters for coxswains
- ~~Hummingbirds~~
- Digital Cameras

Software

- Acquisition Software
  - Hypack Max Survey Data Acquisition Program
  - POS/MV Controller for positioning
  - Isis Software for multibeam acquisition
  - Hydrostar for multibeam acquisition
- Processing Software
  - Hydrosoft Software for singlebeam data manipulation and conversion
  - CARIS HIPS/HDCS with Exceed for data processing and analysis
  - MapInfo for data plotting and analysis
- Utilities
  - Tides and Currents for Windows
- Horizontal Control Software
  - TSIP Talker
  - DSX/National Geodetic Society DSData Extraction
  - Ashtech WinPrism and Mission Planner
  - Fillnet
- Vertical Control Software
  - Sound Velocity VelocWin
  - MS DOS SeaCat Profiler
  - Newiz Leveling Software
  - Tides LogPlot
  - Tides LogStat
  - Tides LogPrn Convert

APPENDIX B

DRAFT ENVIRONMENTAL ASSESSMENT
NOAA Marine Operations Center - Pacific Homeport Site Alternatives

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Site Photographs

Site Alternative 1: Lake Union

Photo No:	Date:
1	03-02-09

Direction Photo Taken:
Looking southwest.

Description:
Photograph of existing MOC-P facility at Lake Union, taken from Fairview Avenue East, towards Administration Building (Building C).

Photo No:	Date:
2	03-02-09

Direction Photo Taken:
Looking northeast.

Description:
Pier 1 (left) and Pier 2 (right), looking out over Lake Union. Warehouse/Laboratory Building (Building D) and Hazardous Waste Storage Area at far right of photograph. Note fire-damage to pier in right foreground.

Site Alternative 1: Lake Union

Photo No:	Date:
3	03-02-09

Direction Photo Taken:
Looking north.

Description:
Warehouse/Laboratory Building (Building D). Parking lot to right of photograph is City-owned, not part of site.

Photo No:	Date:
4	03-02-09

Direction Photo Taken:
Looking southeast.

Description:
Photograph taken from on Wharf Pier, looking towards Shop Building (Building B) and Boatshed/Storage Building (Building A). Note fire-damage to both buildings and pier. Lake Union Drydocks facility in background right (NOAA vessel currently berthed there).

Site Alternative 2: Port Angeles

Photo No:	Date:
5	03-03-09

Direction Photo Taken:
Looking north.

Description:

Site Alternative 2, taken from terrace to south. Land to foreground of road is not part of site. Large building at right is Westport Shipping Yard, on adjacent site. Tanks and small shed in centre of photograph are on adjacent property (Texaco site). Existing Terminal 3 is visible in middle of photograph. Large building in center-left is the warehouse-shop building.

Photo No:	Date:
6	03-03-09

Direction Photo Taken:
Looking east.

Description:

Foreshore of Site Alternative 2, looking towards existing Terminal 3 and old wooden approach pier. Note sediment deposits at mouth of Tumwater Creek.

Site Alternative 2: Port Angeles

Photo No:	Date:
7	03-03-09

Direction Photo Taken:
Looking west.

Description:

Site Alternative 2 from northeast corner of upland area, at mouth of Tumwater Creek. Building in center of photograph is the warehouse-shop building. Tanks at left are on adjacent property (Texaco site).

Photo No:	Date:
8	03-03-09

Direction Photo Taken:
Looking west.

Description:

Photograph taken from Terminal 3 berthing pier, looking towards former log boom area, along alignment of proposed pier extension. Note marina in background, on neighboring property.

Site Alternative 3: Bellingham

Photo No:	Date:
9	03-06-09

Direction Photo Taken:
Looking southwest.

Description:

Photograph of Site Alternative 3, looking across Log Pond towards Former Maintenance Shop (left) and Warehouse One (center). Northern end of berthing terminal visible at right.

Photo No:	Date:
10	03-06-09

Direction Photo Taken:
Looking north.

Description:

Existing terminal, with Warehouse One on right. Whatcom Waterway visible on left.

Site Alternative 3: Bellingham

Photo No:	Date:
11	03-06-09

Direction Photo Taken:
Looking west.

Description:
Site Alternative 3 from approximate eastern boundary of site. Warehouse One (large building) and Former Maintenance Shop (small brown building) in center of photograph. Warehouse Two (on adjacent property) visible at left.

Photo No:	Date:
12	03-06-09

Direction Photo Taken:
Looking north.

Description:
Warehouse One (left) and Former Maintenance Shed (right). Log Pond visible in background.

Site Alternative 4: Newport

Photo No:	Date:
13	03-19-09

Direction Photo Taken:
Looking east.

Description:
Site Alternative 4 from northern side of Yaquina Bay Bridge. Dock 2 is visible and obscuring intake pier. Former fish ladder is visible in front of Dock 2. Brown building in center-left of photograph is part of adjacent Hatfield Marine Science Center.

Photo No:	Date:
14	03-19-09

Direction Photo Taken:
Looking northeast.

Description:
Intake Pier, with city of Newport visible in background. Adjacent Oregon State University (Hatfield Marine Science Center) dock visible at right of photograph.

Site Alternative 4: Newport

Photo No:	Date:
15	03-19-09

Direction Photo Taken:
Looking northwest.

Description:
Dock 2, with city of Newport in background. Dock is currently used for fish buying operation.

Photo No:	Date:
16	03-19-09

Direction Photo Taken:
Looking north.

Description:
Site Alternative 4, from near southern boundary. Former fish farm ponds visible in fore- and mid-ground. Former harvest room (currently used for fruit processing) at left of photograph.

APPENDIX C

DRAFT ENVIRONMENTAL ASSESSMENT
NOAA Marine Operations Center - Pacific Homeport Site Alternatives

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Surrounding Land Uses in proximity to Site Alternatives

28645075_01.cdr

Information used to determine land use included site observations, aerial photograph interpretation and client-provided information.
Base image source: Google Earth Pro

Appendix C-1

Surrounding Land Uses – Site Alternative 1: Lake Union

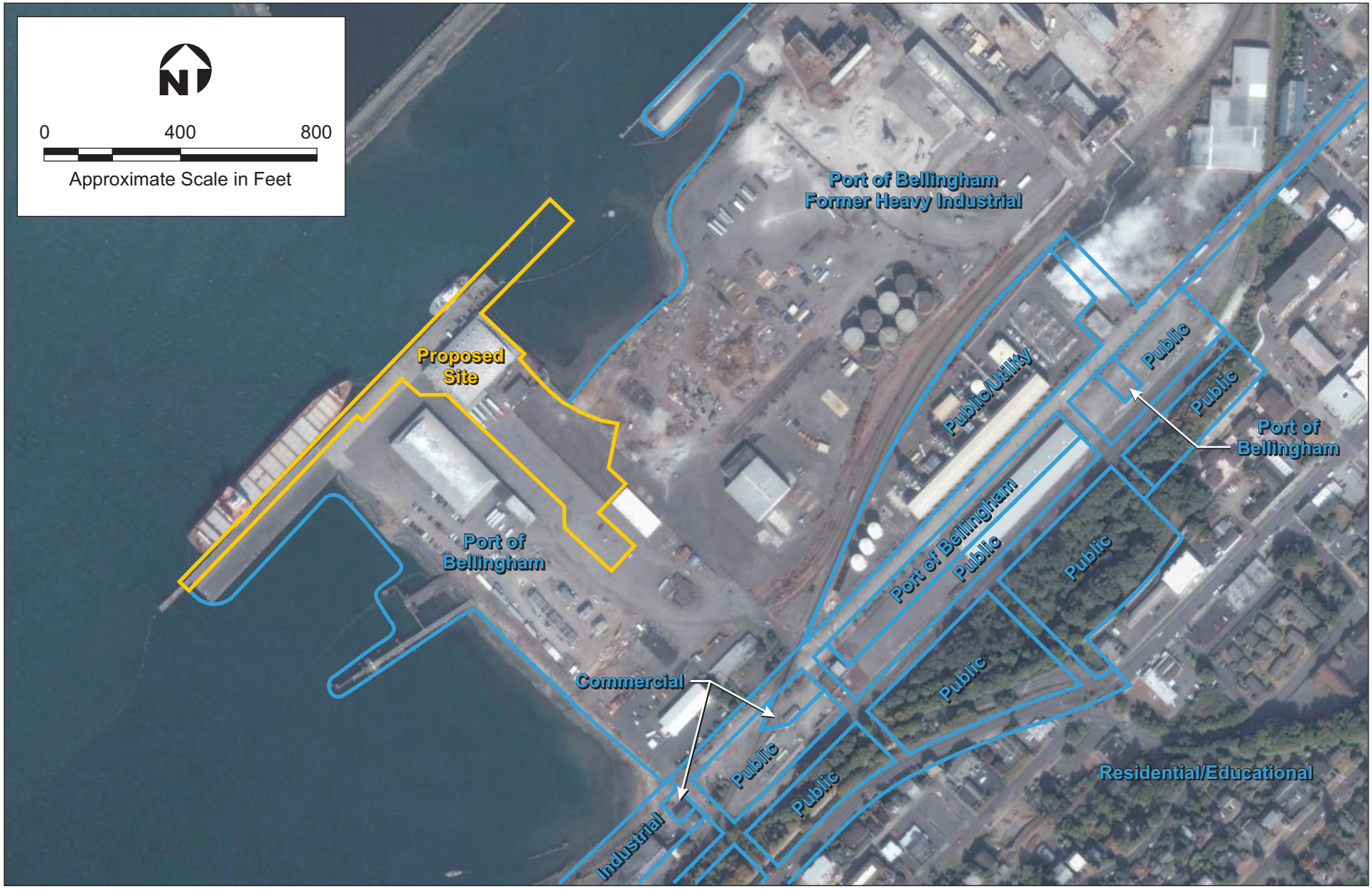
28645075_02.cdr

Information used to determine land use included site observations, aerial photograph interpretation and client-provided information.
Base image source: Google Earth Pro

Appendix C-2

Surrounding Land Uses – Site Alternative 2: Port Angeles

28645075_03.cdr

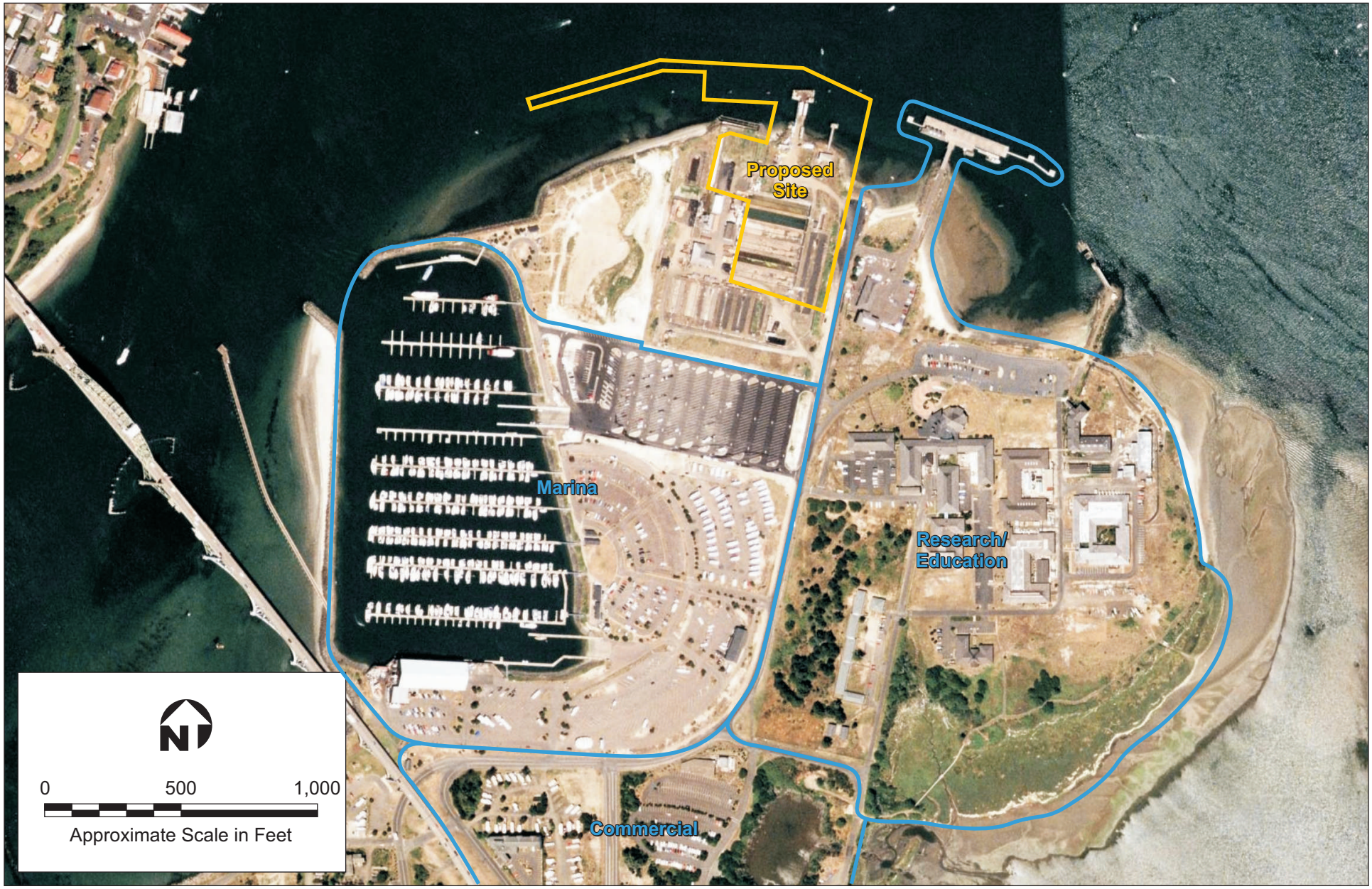


Information used to determine land use included site observations, aerial photograph interpretation and client-provided information.
Base image source: Google Earth Pro

Appendix C-3

Surrounding Land Uses – Site Alternative 3: Bellingham

28645075_04.cdr



Information used to determine land use included site observations, aerial photograph interpretation and client-provided information.
Base image source: Google Earth Pro

Appendix C-4

Surrounding Land Uses – Site Alternative 4: Newport

APPENDIX D

DRAFT ENVIRONMENTAL ASSESSMENT
NOAA Marine Operations Center - Pacific Homeport Site Alternatives

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Protected Marine Species and Habitats

Appendix D – Protected Marine Species and Habitats

In order to assess which species may be present at each alternative site a presence/absence probability scale was generated. The definitions are provided below.

Yes: This was the entry used if the species was documented to be present within the larger harbor or bay that the project site is located within. The column in the table identifies the larger water bodies (Port Angeles Harbor, Bellingham Bay, Lake Union, and Yaquina Bay). The presence/absence table is not exclusive to just the project site as impacts from dredging and underwater noise from pile driving would extend off the project site and into these larger waterbodies, thus potentially impacting these species and/or habitats.

May occur: This was the entry used for the species that are not necessarily documented to be present on the site (within the site footprint) (same as above) but in contrast to the "Yes" choice above, the species may *not* necessarily be within the project site waterbody either but rather the species occurs naturally close enough to the project site waterbody that they may enter it from time to time in a more likely than less likely scenario. Or stated another way: the species may occur in another waterbody adjacent to the harbor or bay that the proposed site is in.

Occasionally: Less frequently than may occur, but more likely than unlikely.

Unlikely: This entry was used if it was more unlikely versus more likely that the species would be present. This would be a much rarer occurrence, or not expected.

No: Not documented, not the correct habitat, or out of its range (habitat distribution) or just not a likely place for that species to be.

Table 1: State and Federal Status of Marine Species and Habitat Potentially Present at each Site Alternative

Species[1]	State Status WA[2]	State Status OR[2]	Federal Status[3]	Possibly Present in Project Vicinity			
				Port Angeles Harbor	Bellingham Bay	Lake Union	Newport, Yaquina Bay
Habitats							
Freshwater Wetlands / Fresh Deepwater	Priority Habitat	na	None	No	No	Yes	No
Instream	Priority Habitat	na	None	Yes adjacent to site	No, but near site	No	No, but river near site
Nearshore – (Ordinary high water mark to intertidal to subtidal)	Priority Habitat	na	None	Yes	Yes	No	Yes

Species[1]	State Status WA[2]	State Status OR[2]	Federal Status[3]	Possibly Present in Project Vicinity			
				Port Angeles Harbor	Bellingham Bay	Lake Union	Newport, Yaquina Bay
Marine Mammals							
Sea Otter (*Enhydra lutris kenyoni)-Washington Stock*)	PS, SE	ST	None	May occur	Occasional	No	Occasional
California Sea Lion (*Zalophus californianus*)	PS	None	None	Yes	Yes	No	Yes
Steller Sea Lion (*Eumetopias jubatus*)	PS, ST	None	T	Yes	Yes	No	Yes
Harbor Seal (*Phoca vitulina richardsi*)	PS	None	None	Yes	Yes	No	Yes
Northern Elephant Seal (*Mirounga angustirostris*)	None	None	None	May occur, as present in Strait of Juan de Fuca	May occur, as present in Strait of Juan de Fuca	No	May occur
Harbor Porpoise (*Phocoena phocoena*)	PS, SC	None	None	Yes	Yes	No	Yes
Dall's Porpoise (*Phocoenoides dalli*)	PS	None	None	Yes	Yes	No	No
Gray Whale (*Eschrichtius robustus*)	PS, SS	SE	None	May occur, as present in Strait of Juan de Fuca	Yes	No	Yes
Southern Resident Killer Whale (*Orcinus orca*)	PS, SE	None	E	Yes	Yes	No	May occur, as present along coast
Humpback Whale (*Megaptera novaeangliae*)	PS, SE	SE	E	May occur, as present in Strait of Juan de Fuca	May occur, as present in Strait of Juan de Fuca	No	May occur, as present along coast
Minke Whale (*Balaenoptera*	None	None	None	May occur,	May occur, as present	No	No

Species[1]	State Status WA[2]	State Status OR[2]	Federal Status[3]	Possibly Present in Project Vicinity			
				Port Angeles Harbor	Bellingham Bay	Lake Union	Newport, Yaquina Bay
acutorostrata)				aspresent in Strait of Juan de Fuca	in Strait of Juan de Fuca		
Seabirds & Other Birds							
Brandt's cormorant (*Phalacrocorax penicillatus*)	PS, SC	None	None	Yes	Yes	No	Yes
Brant (*Branta bernicla*)	PS	None	None	Yes	Yes	No	Yes
Brown Pelican (*Pelecanus occidentalis*)	PS,SE	SE	E	Unlikely	Unlikely	No	Yes
Cassin's auklet (*Ptychoramphus aleuticus*)	PS, SC	SV	SOC	Unlikely	Unlikely	No	Unlikely
Common murre (*Uria aalge*)	PS, SC	None	None	Yes	Yes	No	Yes
Marbled Murrelet (*Brachyramphus marmoratus*)	PS, ST	ST	T	Yes	Yes	No	Yes
Short-Tailed Albatross (*Phoebastria albatrus*)	PS, SC	SE	E	Unlikely	Unlikely	No	Unlikely
Snowy plover (*Charadrius alexandrinus*)	PS, SE	ST	T	No	No	No	Yes
Tufted puffin (*Fratercula cirrhata*)	PS, SC	SV	SOC	Yes	Occasional	No	Yes
Great Blue Heron (*Ardea herodias*)	PS	None	None	Yes	Yes	No	Yes
Bald Eagle (*Haliaeetus leucocephalus*)	PS, SS	ST	SOC	Yes	Yes	May occur	Yes
Western Grebe (*Aechmophorus occidentalis*)	PS, SC	None	None	Yes	Yes	Yes	Yes

Species[1]	State Status WA[2]	State Status OR[2]	Federal Status[3]	Possibly Present in Project Vicinity			
				Port Angeles Harbor	Bellingham Bay	Lake Union	Newport, Yaquina Bay
Western Washington breeding concentrations of: Alcids, Cormorants, Storm-petrels, and Terns	PS	None	None	Yes	Yes	No	Yes
Western Washington nonbreeding concentrations of: Alcids, Charadriidae, Cormorants, Fulmar, Grebes, Loons, Phalaropodidae, Scolopacidae, Shearwaters, Storm-petrels	PS	None	None	Yes	Yes	May Occur (Grebes)	Yes
Sea Turtles							
Green Sea Turtle (*Chelonia mydas*)	ST	SE	E	Unlikely	Unlikely	No	Unlikely
Olive Ridley Sea Turtle (*Lepidochelys olivacea*)	None	ST	E	Unlikely	Unlikely	No	Unlikely
Leatherback Sea Turtle (*Dermochelys coriacea*)	SE	SE	E	Unlikely	Unlikely	No	Unlikely
Loggerhead Sea Turtle (*Caretta caretta*)	ST	ST	T	Unlikely	Unlikely	No	Unlikely

Species[1]	State Status WA[2]	State Status OR[2]	Federal Status[3]	Possibly Present in Project Vicinity			
				Port Angeles Harbor	Bellingham Bay	Lake Union	Newport, Yaquina Bay
Fish							
Chinook Salmon (*Oncorhynchus tshawytscha*)	PS, SC	T or None	T	Yes	Yes	Yes	Yes
Coho Salmon (*O. kisutch*)	PS, SC	E or None	SOC-Puget Sound ESU, T-Lower Columbia	Yes	Yes	Yes	Yes
Chum Salmon (*O. keta*)	PS, SC	None	T	Yes	Yes	No	Yes
Pink Salmon (*O. gorbuscha*)	PS	None	None	Yes	Yes	No	No
Sockeye Salmon (*O. nerka*)	PS, SC	None	T and E	Yes	Yes	Yes	No
Steelhead *O. mykiss)*	PS	None	T	Yes	Yes	Yes	Yes
Coastal Resident / Searun Cutthroat (*O. clarki clarki*)	PS	None	None	Yes	Yes	Yes	Yes
Bull Trout (*Salvelinus confluentus*)	PS, SC	None	T	Yes	Yes	Occasional	No
Green Sturgeon (*Acipenser medirostris*)	PS	None	T	May occur	May occur	No	May occur
Pacific Lamprey (*Lampetra tridentata*)	PS	SV	SOC	Yes	Yes	Yes	Yes
Pacific Herring (*Clupea pallasi*)	PS, SC	None	SOC	Yes	Yes	No	Yes
Eulachon (*Thaleichthys pacificus*)	PS, SC	None	PT	Yes	Yes	No	Yes
Longfin Smelt (*Spirinchus thaleichthys*)	PS	None	None	Yes	Yes	No	Yes
Surfsmelt (*Hypomesus pretiosus*)	PS	None	None	Yes	Yes	No	Yes

Species[1]	State Status WA[2]	State Status OR[2]	Federal Status[3]	Possibly Present in Project Vicinity			
				Port Angeles Harbor	Bellingham Bay	Lake Union	Newport, Yaquina Bay
Pacific Cod (*Gadus macrocephalus*)	PS, SC	None	SOC	Yes	Yes	No	Yes
Pacific Hake (*Merluccius productus*)	PS, SC	None	SOC	Yes	Yes	No	Yes
Walleye Pollock (*Theragra chalcogramma*)	PS, SC	None	SOC	Yes	Yes	No	Yes
Black Rockfish (*Sebastes melanops*)	PS, SC	None	None	Yes	Yes	No	Yes
Bocaccio Rockfish (*Sebastes paucispinis*)	PS, SC	None	None	Yes	No	No	Yes
Brown Rockfish (*Sebastes auriculatus*)	PS, SC	None	SOC	Yes	Yes	No	Yes
Canary Rockfish (*Sebastes pinniger*)	PS, SC	None	None	Yes	Yes	No	Yes
China Rockfish (*Sebastes nebulosus*)	PS, SC	None	None	Yes	No	No	Yes
Copper Rockfish (*Sebastes caurinus*)	PS, SC	None	SOC	Yes	Yes	No	Yes
Greenstriped Rockfish (*Sebastes elongates)*	PS, SC	None	None	Yes	Yes	No	Yes
Quillback Rockfish (*Sebastes maliger*)	PS, SC	None	SOC	Yes	Yes	No	Yes
Redstripe Rockfish (*Sebastes proriger*)	PS, SC	None	None	Yes	Yes	No	Yes
Tiger Rockfish (*Sebastes nigrocinctus*)	PS, SC	None	None	Yes	No	No	Yes
Widow Rockfish (*Sebastes entomelas*)	PS, SC	None	None	Yes	No	No	Yes

Species[1]	State Status WA[2]	State Status OR[2]	Federal Status[3]	Possibly Present in Project Vicinity			
				Port Angeles Harbor	Bellingham Bay	Lake Union	Newport, Yaquina Bay
Yelloweye Rockfish (*Sebastes ruberrimus*)	PS, SC	None	None	Yes	Yes	No	Yes
Yellowtail Rockfish (*Sebastes flavidus*)	PS, SC	None	None	Yes	Yes	No	Yes
Lingcod (*Ophiodon elongates*)	PS	None	None	Yes	Yes	No	Yes
Pacific Sand Lance (*Ammodytes hexapterus*)	PS	None	None	Yes	Yes	No	Yes
English Sole (*Parophyrs vetulus*)	PS	None	None	Yes	Yes	No	Yes
Rock Sole (*Lepidopsetta bilineata*)	PS	None	None	Yes	Yes	No	Yes
Shellfish							
Pinto (Northern) abalone (*Haliotis kamtschatkana)*	PS, SC	None	SOC	No	No	No	No
Butter clam (*Saxidomus gigantea)*	PS	None	None	Yes	Yes	No	Yes
Geoduck clam (*Panopea abrupta)*	PS	None	None	Yes	Yes	No	Yes
Manila clam (Japanese Littleneck clam) (*Tapes philippinarum)*	PS, Non-native species	None	None	Yes	Yes	No	Yes
Pacific (native) Littleneck clam (*Protothaca staminea*)	PS	None	None	Yes	Yes	No	Yes
Olympia oyster (*Ostrea lurida)*	PS, SC	None	None	May occur	May occur	No	Yes
Pacific oyster (*Crassostrea gigas)*	PS, non-native	None	None	Yes	Yes	No	Yes
Razor clam (*Siliqua patula)*	PS	None	None	No	No	No	No

Species[1]	State Status WA[2]	State Status OR[2]	Federal Status[3]	Possibly Present in Project Vicinity			
				Port Angeles Harbor	Bellingham Bay	Lake Union	Newport, Yaquina Bay
Dungeness crab (*Cancer magister)*	PS	None	None	Yes	Yes	No	Yes
Pandalid shrimp (Pandalidae) (*Pandalus spp.)*	PS	None	None	Yes	Yes	No	Yes
Red Urchin (*Strongylocentrotus franciscanus*)	PS	None	None	No	No	No	No

1. List from WDFW and ODFW.
   WDFW sources: http://wdfw.wa.gov/wlm/diversty/soc/soc.htm and http://wdfw.wa.gov/hab/phslist.htm and Washington Department of Fish and Wildlife. 2008. Priority Habitat and Species List. Olympia, Washington. 174 pp.
   ODFW sources: ODFW Sensitive Species List available at: http://www.dfw.state.or.us/wildlife/diversity/species/sensitive_species.asp and ODFW Threatened, Endangered, and Candidate Fish and Wildlife Species in Oregon available at: http://www.dfw.state.or.us/wildlife/diversity/species/threatened_endangered_species.asp
2. State Status: Priority Species (PS), State Endangered (SE), State Threatened (ST), State Sensitive (SS), State Candidate (SC), State Vulnerable (SV)
3. Federal Status: Endangered (E), Threatened (T), Proposed Threatened (PT), Federal Candidate (C), Federal Species of Concern (SOC).

APPENDIX E

DRAFT ENVIRONMENTAL ASSESSMENT
NOAA Marine Operations Center - Pacific Homeport Site Alternatives

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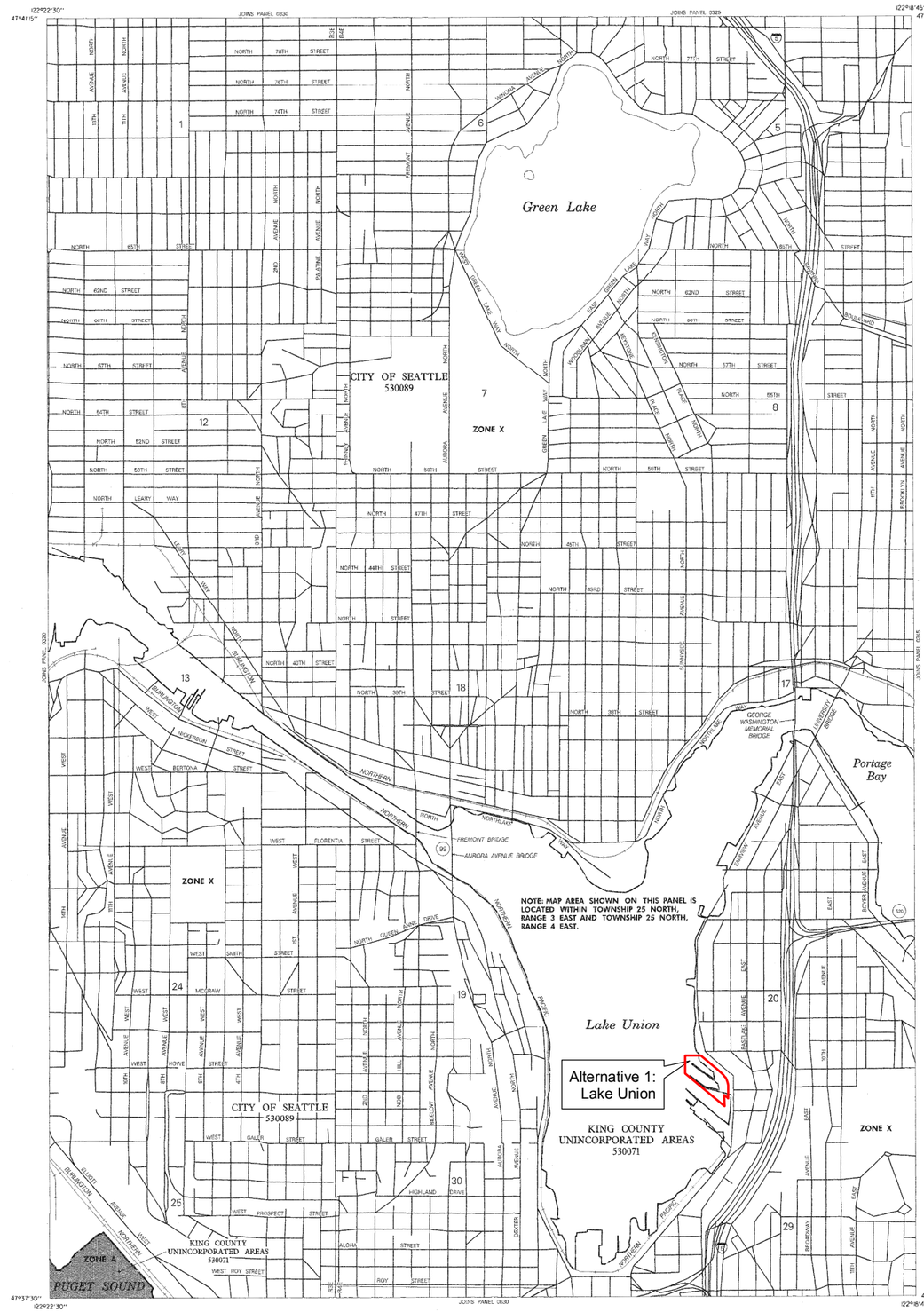
FEMA Flood Insurance Rate Maps for Site Alternatives

Appendix E-1
FEMA FIRM
Site Alternative 1
Draft EA - June 2009



*Scaled to 1" = 2400'

LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

ZONE A No base flood elevations determined.

ZONE AE Base flood elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE A99 To be protected from 100-year flood by Federal flood protection system under construction; no base elevations determined.

ZONE V Coastal flood with velocity hazard (wave action); no base flood elevations determined.

ZONE VE Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

ZONE X Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS

ZONE X Areas determined to be outside 500-year floodplain.

ZONE D Areas in which flood hazards are undetermined.

UNDEVELOPED COASTAL BARRIERS

Identified 1983 | Identified 1990 | Otherwise Protected Areas

Coastal Barrier areas are normally located within or adjacent to Special Flood Hazard Areas.

Flood Boundary

Floodway Boundary

Zone D Boundary

Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.

~~~513~~~ Base Flood Elevation Line; Elevation in Feet. See Map Index for Elevation Datum.

(D)——(D) Cross Section Line

(EL 987) Base Flood Elevation in Feet where Uniform within Zone. See Map Index for Elevation Datum.

RM7 × Elevation Reference Mark

● M2 River Mile

97°07'30", 32°22'30" Horizontal Coordinates Based on North American Datum of 1927 (NAD 27) Projection.

NOTES

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas.

Coastal base flood elevations apply only landward of 0.0' NGVD, and include the effects of wave action; these elevations may also differ significantly from those developed by the National Weather Service for hurricane evacuation planning.

Areas of Special Flood Hazard (100-year flood) include Zones A, AE, AH, AO, A99, V, and VE.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Floodway widths are provided in the Flood Insurance Study Report.

This map may incorporate approximate boundaries of Coastal Barrier Resource System Units and/or Otherwise Protected Areas established under the Coastal Barrier Improvement Act of 1990 (PL 101-591).

Corporate limits shown are current as of the date of this map. The user should contact appropriate community officials to determine if corporate limits have changed subsequent to the issuance of this map.

For community map revision history prior to countywide mapping, see Section 9.0 of the Flood Insurance Study Report.

For adjoining map panels and base map source see separately printed Map Index.

MAP REPOSITORY
Refer to Repository Listing on Map Index

EFFECTIVE DATE OF
COUNTYWIDE FLOOD INSURANCE RATE MAP:
SEPTEMBER 29, 1989

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL:
Revised May 16, 1995 to update map format.

To determine if flood insurance is available, contact an insurance agent or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE IN FEET
1000 0 1000

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

KING COUNTY,
WASHINGTON AND
INCORPORATED AREAS

PANEL 340 OF 1725
(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS: COMMUNITY	NUMBER	PANEL	SUFFIX
KING COUNTY, UNINCORPORATED AREAS	530071	0340	F
SEATTLE, CITY OF	530083	0340	F

MAP NUMBER
53033C0340 F

MAP REVISED:
MAY 16, 1995

Federal Emergency Management Agency
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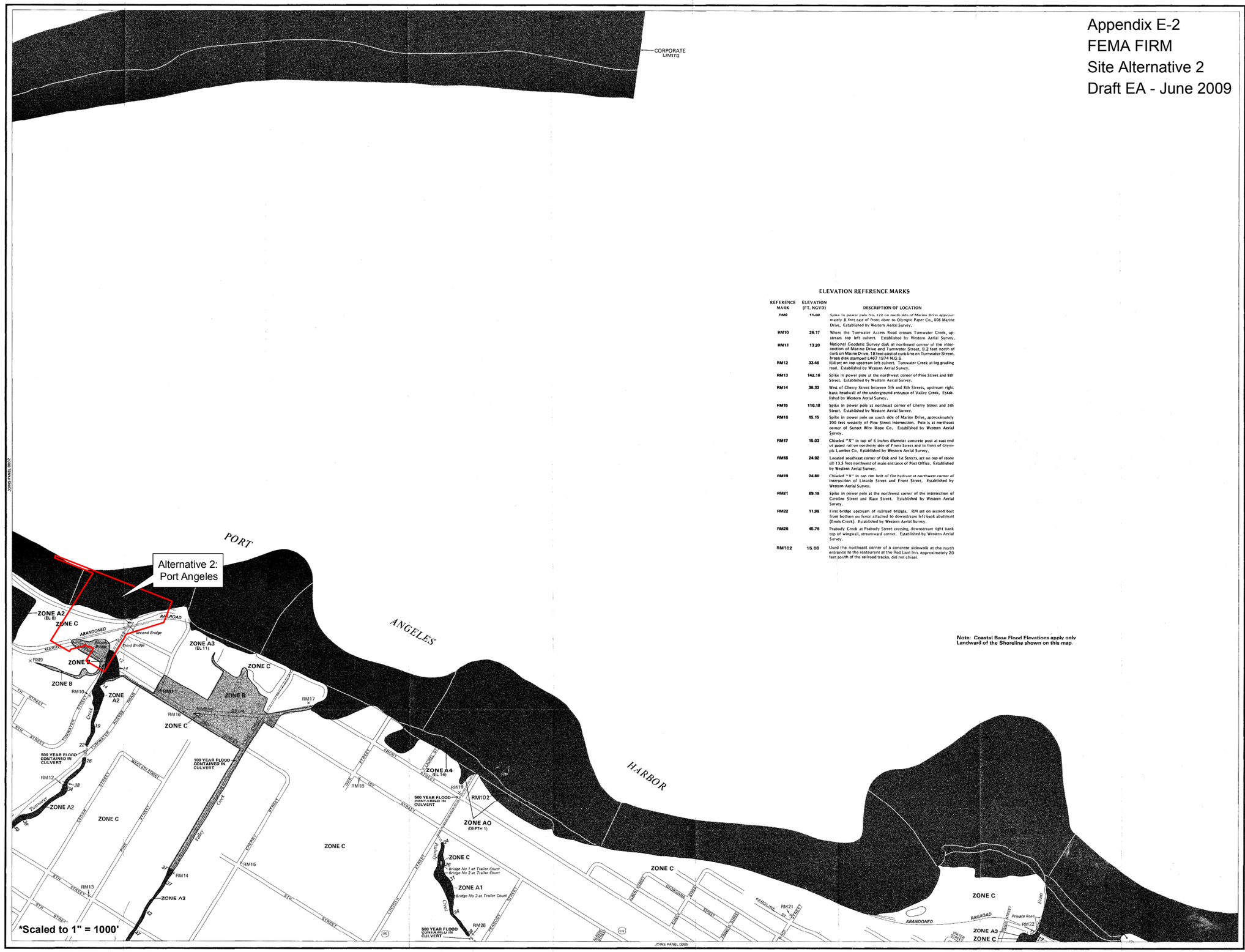
Appendix E-2
FEMA FIRM
Site Alternative 2
Draft EA - June 2009



Note: Coastal Base Flood Elevations apply only Landward of the Shoreline shown on this map.

ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FT. NGVD)	DESCRIPTION OF LOCATION
RM9	11.00	Spike in power pole No. 122 on south side of Marine Drive approximately 8 feet east of front door to Olympic Paper Co., 808 Marine Drive. Established by Western Aerial Survey.
RM10	26.17	Where the Tumwater Access Road crosses Tumwater Creek, upstream top left culvert. Established by Western Aerial Survey.
RM11	13.20	National Geodetic Survey disk at northeast corner of the intersection of Marine Drive and Tumwater Street, 9.2 feet north of curb on Maine Drive, 18 feet east of curb line on Tumwater Street, brass disk stamped L467 1974 N G.S.
RM12	33.46	RM set on top upstream left culvert. Tumwater Creek at log grading road. Established by Western Aerial Survey.
RM13	142.16	Spike in power pole at the northwest corner of Pine Street and 8th Street. Established by Western Aerial Survey.
RM14	36.33	West of Cherry Street between 5th and 8th Streets, upstream right bank headwall of the underground entrance of Valley Creek. Established by Western Aerial Survey.
RM15	110.18	Spike in power pole at northeast corner of Cherry Street and 5th Street. Established by Western Aerial Survey.
RM16	15.15	Spike in power pole on south side of Marine Drive, approximately 200 feet westerly of Pine Street intersection. Pole is at northeast corner of Sunset Wire Rope Co. Established by Western Aerial Survey.
RM17	15.03	Chiseled "X" in top of 6 inches diameter concrete post at east end of guard rail on northerly side of Front Street and in front of Olympic Lumber Co. Established by Western Aerial Survey.
RM18	24.02	Located southeast corner of Oak and 1st Streets, set on top of stone sill 13.5 feet northwest of main entrance of Post Office. Established by Western Aerial Survey.
RM19	24.80	Chiseled "X" in top rim bolt of fire hydrant at northwest corner of intersection of Lincoln Street and Front Street. Established by Western Aerial Survey.
RM21	89.19	Spike in power pole at the northwest corner of the intersection of Caroline Street and Race Street. Established by Western Aerial Survey.
RM22	11.99	First bridge upstream of railroad bridges. RM set on second bolt from bottom on fence attached to downstream left bank abutment (Ennis Creek). Established by Western Aerial Survey.
RM26	46.76	Peabody Creek at Peabody Street crossing, downstream right bank top of wingwall, streamward corner. Established by Western Aerial Survey.
RM102	15.08	Used the northeast corner of a concrete sidewalk at the north entrance to the restaurant at the Red Lion Inn, approximately 20 feet south of the railroad tracks, did not chisel.

KEY TO MAP

- 500-Year Flood Boundary
- 100-Year Flood Boundary
- Zone Designations — ZONE B / ZONE B
- 100-Year Flood Boundary
- 500-Year Flood Boundary
- Base Flood Elevation Line With Elevation In Feet** — 513
- Base Flood Elevation In Feet Where Uniform Within Zone** — (EL 987)
- Elevation Reference Mark — RM7×
- Zone D Boundary
- River Mile — •M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
AO	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1-A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas.

Areas of special flood hazard (100-year flood) include Zones A, A1-30, AE, AH, AO, A99, V, V1-30 AND VE.

Certain areas not in the Special Flood Hazard Areas (zones A and V) may be protected by flood control structures.

Coastal base flood elevations apply only landward of the shoreline shown on this map.

For adjoining map panels, see separately printed Index to Map Panels.

INITIAL IDENTIFICATION:
MAY 31, 1974

FLOOD HAZARD BOUNDARY MAP REVISIONS:
JANUARY 16, 1976

FLOOD INSURANCE RATE MAP EFFECTIVE:
AUGUST 1, 1980

FLOOD INSURANCE RATE MAP REVISIONS:

May revised September 28, 1990 to change base flood elevations, to change special flood hazard areas, to change zone designations, to add roads and road names and to reflect updated topographic information.

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program, at (800) 638-6620.

APPROXIMATE SCALE IN FEET
400 0 400

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
PORT ANGELES,
WASHINGTON
CLALLAM COUNTY

PANEL 3 OF 6
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
530023 0003 C

MAP REVISED:
SEPTEMBER 28, 1990

Federal Emergency Management Agency

Appendix E-3
FEMA FIRM
Site Alternative 3
Draft EA - June 2009

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program. It does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size. The **community map repository** should be consulted for possible updated or additional flood hazard information.

To obtain more detailed information in areas where **Base Flood Elevation** (BFEs) and/or **floodways** have been determined, users are encouraged to consult the Flood Profiles and Floodway Data tables contained within the Flood Insurance Study (FIS) report that accompanies this FIRM. Users should be aware that BFEs shown on the FIRM represent rounded whole-foot elevations. These BFEs are intended for flood insurance rating purposes only and should not be used as the sole source of flood elevation information. Accordingly, flood elevation data presented in the FIS should be utilized in conjunction with the FIRM for purposes of construction and/or floodplain management.

Coastal Base Flood Elevation (BFEs) shown on this map apply only landward of 0.0' National Geodetic Vertical Datum (NGVD). Users of this FIRM should be aware that coastal flood elevations may also be provided in the Summary of Stillwater Elevations table in the Flood Insurance Study report for this community. Elevations shown in the Summary of Stillwater Elevations table should be used for construction, and/or floodplain management purposes when they are higher than the elevations shown on this FIRM.

Boundaries of the **floodways** were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the National Flood Insurance Program. Floodway widths and other pertinent floodway data are provided in the Flood Insurance Study report for this jurisdiction.

Certain areas not in Special Flood Hazard Areas may be protected by **flood control structures.** Refer to Section 2.4 "Flood Protection Measures" of the Flood Insurance Study report for information on flood control structures in this jurisdiction.

The **projection** used in the preparation of this map is Universal Tranverse Mercator (UTM) zone 10. The **horizontal datum** is NAD83, GRS1980 spheroid. Differences in datum, spheroid, projection or UTM zones used in the production of FIRMs for adjacent jurisdictions may result in slight positional differences in map features across jurisdiction boundaries. These differences do not affect the accuracy of the FIRM.

Flood elevations on this map are referenced to the National Geodetic Vertical Datum of 1929. These flood elevations must be compared to structure and ground elevations referenced to the same **vertical datum.** For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, visit the National Geodetic Survey website at www.ngs.noaa.gov or contact the National Geodetic Survey at the following address:

Spatial Reference System Division
National Geodetic Survey, NOAA
Silver Spring Metro Center
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

To obtain current elevation, description, and/or location information for **bench marks** shown on this map, please contact the Information Services Branch of the National Geodetic Survey at **(301) 713-3242,** or visit their website at www.ngs.noaa.gov.

Base map information shown on this FIRM was provided in digital format by Whatcom County Engineering Department.

Corporate limits shown on this map are based on the best data available at the time of publication. Because changes due to annexations or de-annexations may have occurred after this map was published, map users should contact appropriate community officials to verify current corporate limit locations.

Please refer to the separately printed **Map Index** for an overview map of the county showing the layout of map panels; community map repository addresses; and a Listing of Communities table containing National Flood Insurance Program dates for each community as well as a listing of the panels on which each community is located.

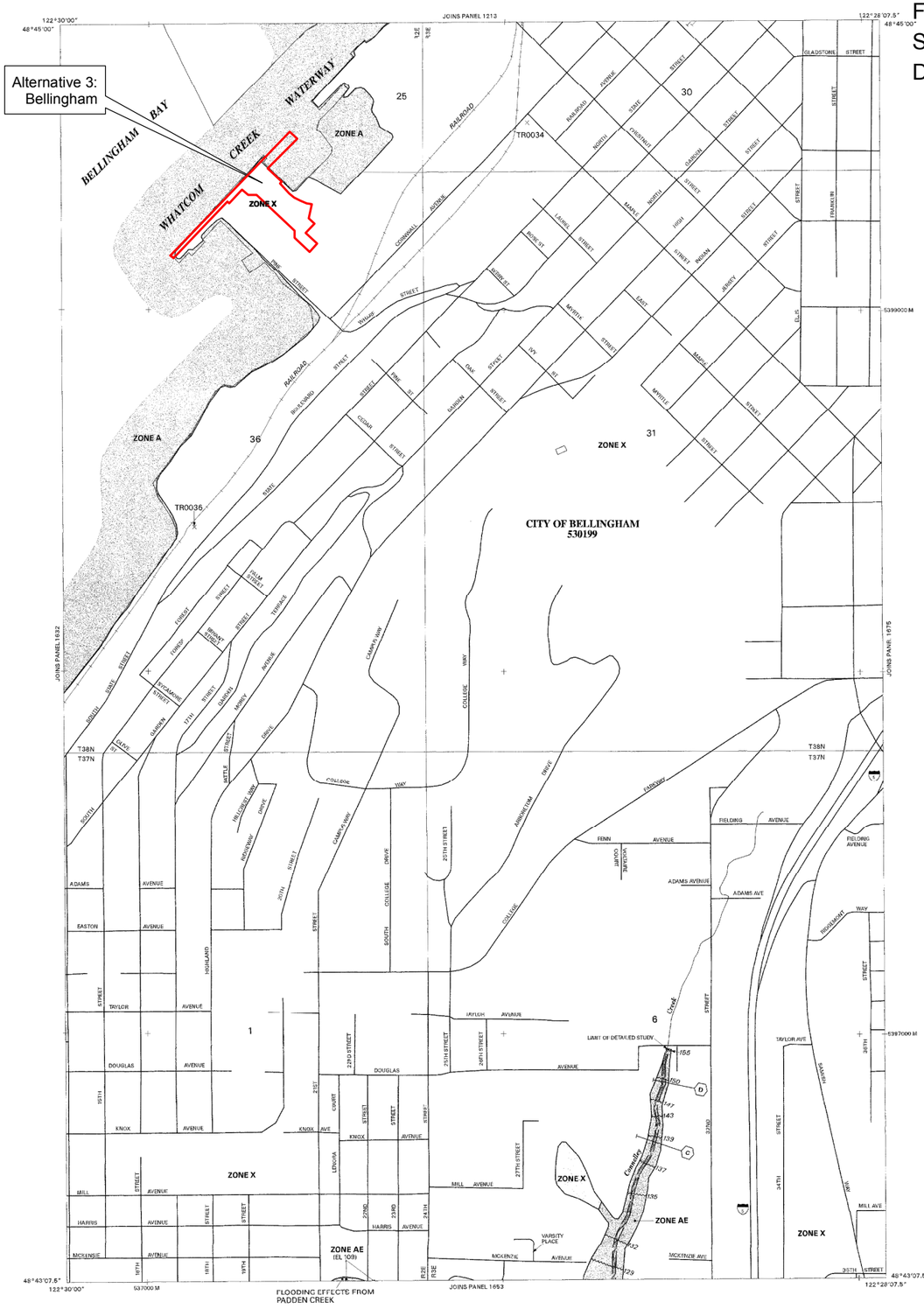
An accompanying Flood Insurance Study report, Letters of Map Revision or Letters of Map Amendment revising portions of this panel, and digital versions of this PANEL may be available. Contact the **FEMA Map Service Center** at the following phone numbers and Internet address for information on all related products available from FEMA:

Phone: 800-358-9616
FAX: 800-358-9620
www.fema.gov/msc

If you have **questions about this map** or questions concerning the National Flood Insurance Program in general, please call **1-877-FEMA-MAP** (1-877-336-2627) or visit the FEMA website at www.fema.gov.

This map reflects more detailed and up-to-date stream channel configurations than those shown on the previous FIRM for this jurisdiction. The floodplains and floodways that were transferred from the previous FIRM may have been adjusted to conform to these new stream channel configurations. As a result, the Flood Profiles and Floodway Data tables in the Flood Insurance Study report may reflect stream channel distances that differ from what is shown on this map.

***Scaled to 1" = 1200'**



LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUNDATION BY THE 1% ANNUAL CHANCE FLOOD EVENT

The 1% annual chance flood (100-year flood), also known as the base flood, is the flood that has a 1% chance of being equaled or exceeded in any given year. The Special Flood Hazard Area is the area subject to flooding by the 1% annual chance flood. Areas of Special Flood Hazard include Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the water surface elevation of the 1% annual chance flood.

ZONE A	No base flood elevations determined.
ZONE AE	Base flood elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
ZONE AR	Area of special flood hazard formerly protected from the 1% annual chance flood event by a flood control system that was subsequently decertified. Zone AR indicates that the former flood control system is being restored to provide protection from the 1% annual chance or greater flood event.
ZONE A99	Area to be protected from 1% annual chance flood event by a Federal flood protection system under construction; no base flood elevations determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no base flood elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights.

OTHER FLOOD AREAS

ZONE X	Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood.

OTHER AREAS

ZONE X	Areas determined to be outside the 0.2% annual chance floodplain.
ZONE D	Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Areas.

	Floodplain boundary
	Floodway boundary
	Zone D boundary
	CBRS and OPA boundary
	Boundary dividing Special Flood Hazard Areas of different Base Flood Elevations, flood depths or velocities.
513	Base Flood Elevation line and value; elevation in feet*
(EL 987)	Base Flood Elevation value where uniform within zone; elevation in feet*

*Referenced to the National Geodetic Vertical Datum of 1929

(A)———(A)	Cross Section Line
(23)- - - - - -(23)	Transect Line
97°07'30", 32°22'30"	Geographic coordinates referenced to the North American Datum of 1983 (NAD 83)
4276000M	1000-meter Universal Transverse Mercator grid values, zone 10
600000 FT	5000-foot grid ticks
DX5510 ×	Bench mark (see explanation in Notes to Users section of this FIRM panel).
• M1.5	River Mile

MAP REPOSITORY
Refer to Repository Listing on Index Map

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
JANUARY 16, 2004

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Community Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at (800) 638-6620.

MAP SCALE 1" = 500'

250 0 500 1000 FEET

150 0 150 300 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 1651D

FIRM
FLOOD INSURANCE RATE MAP
WHATCOM COUNTY, WASHINGTON
(ALL JURISDICTIONS)

PANEL 1651 OF 2025

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
BELLINGHAM, CITY OF	530199	1651	D

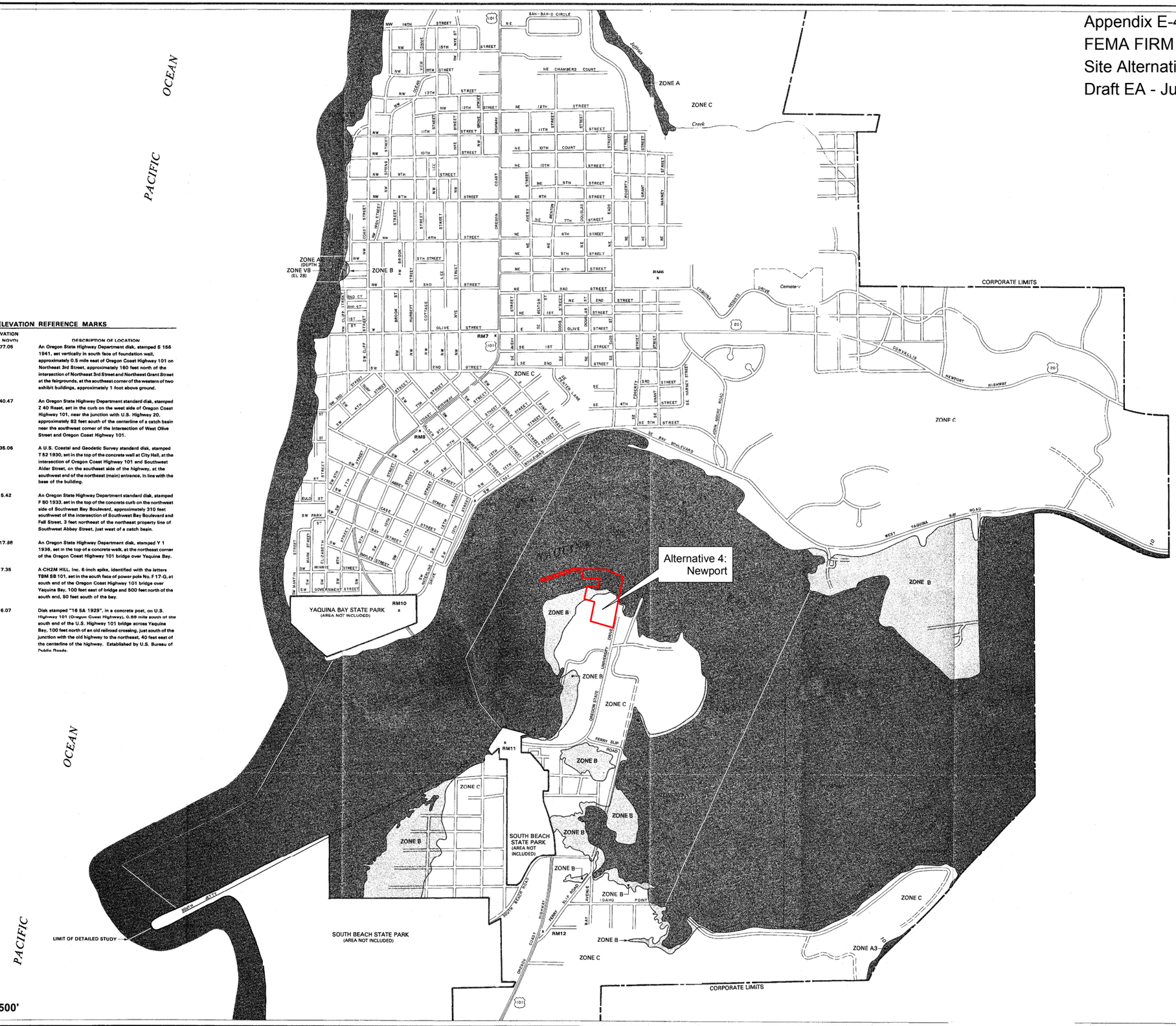
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
53073C1651D

EFFECTIVE DATE:
JANUARY 16, 2004

Federal Emergency Management Agency

Appendix E-4
FEMA FIRM
Site Alternative 4
Draft EA - June 2009



ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FT NGVD)	DESCRIPTION OF LOCATION
RM6	177.05	An Oregon State Highway Department disk, stamped S 156 1941, set vertically in south face of foundation wall, approximately 0.5 mile east of Oregon Coast Highway 101 on Northeast 3rd Street, approximately 160 feet north of the intersection of Northeast 3rd Street and Northeast Grant Street at the fairgrounds, at the southeast corner of the western of two exhibit buildings, approximately 1 foot above ground.
RM7	140.47	An Oregon State Highway Department standard disk, stamped Z 40 Reset, set in the curb on the west side of Oregon Coast Highway 101, near the junction with U.S. Highway 20, approximately 82 feet south of the centerline of a catch basin near the southwest corner of the intersection of West Olive Street and Oregon Coast Highway 101.
RM8	135.06	A U.S. Coastal and Geodetic Survey standard disk, stamped T 52 1930, set in the top of the concrete wall at City Hall, at the intersection of Oregon Coast Highway 101 and Southwest Alder Street, on the southeast side of the highway, at the southwest end of the northeast (main) entrance, in line with the base of the building.
RM9	15.42	An Oregon State Highway Department standard disk, stamped F 80 1933, set in the top of the concrete curb on the northwest side of Southwest Bay Boulevard, approximately 310 feet southwest of the intersection of Southwest Bay Boulevard and Fall Street, 3 feet northeast of the northeast property line of Southwest Abbey Street, just west of a catch basin.
*RM10	117.98	An Oregon State Highway Department disk, stamped Y 1 1936, set in the top of a concrete walk, at the northeast corner of the Oregon Coast Highway 101 bridge over Yaquina Bay.
*RM11	17.35	A CH2M HILL, Inc. 6-inch spike, identified with the letters TBM SB 101, set in the south face of power pole No. F 17-G, at south end of the Oregon Coast Highway 101 bridge over Yaquina Bay, 100 feet east of bridge and 500 feet north of the south end, 50 feet south of the bay.
RM12	16.07	Disk stamped "16 5A 1929", in a concrete post, on U.S. Highway 101 (Oregon Coast Highway), 0.55 mile south of the south end of the U.S. Highway 101 bridge across Yaquina Bay, 100 feet north of an old railroad crossing, just south of the junction with the old highway to the northeast, 40 feet east of the centerline of the highway. Established by U.S. Bureau of Public Roads.

*Located In Area Not Included

*Scaled to 1" = 1500'

KEY TO MAP

500-Year Flood Boundary
100-Year Flood Boundary
Zone Designations*
100-Year Flood Boundary
500-Year Flood Boundary

ZONE B
ZONE B

Base Flood Elevation Line With Elevation In Feet** — 513

B_{FE} Flood Elevation in Feet Where Uniform Within Zone** — (EL 987)

Elevation Reference Mark — $RM7_X$

River Mile — • M1.5

**Referenced to the National Geodetic Vertical Datum of 1929

*EXPLANATION OF ZONE DESIGNATIONS

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
AO	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; average depths of inundation are shown, but no flood hazard factors are determined.
AH	Areas of 100-year shallow flooding where depths are between one (1) and three (3) feet; base flood elevations are shown, but no flood hazard factors are determined.
A1 A30	Areas of 100-year flood; base flood elevations and flood hazard factors determined.
A99	Areas of 100-year flood to be protected by flood protection system under construction; base flood elevations and flood hazard factors not determined.
B	Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one (1) foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood. (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, flood hazards.
V	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors not determined.
V1-V30	Areas of 100-year coastal flood with velocity (wave action); base flood elevations and flood hazard factors determined.

NOTES TO USER

Certain areas not in the special flood hazard areas (zones A and V) may be protected by flood control structures.

This map is for flood insurance purposes only; it does not necessarily show all areas subject to flooding in the community or all planimetric features outside special flood hazard areas.

For adjoining map panels, see separately printed Index To Map Panels.

INITIAL IDENTIFICATION:
MAY 24, 1974

FLOOD HAZARD BOUNDARY MAP REVISIONS:
JULY 2, 1976

FLOOD INSURANCE RATE MAP EFFECTIVE:
APRIL 15, 1980

FLOOD INSURANCE RATE MAP REVISIONS:
JUNE 15, 1982 To change Corporate Limits, to add new Special Flood Hazard Areas, to reduce Special Flood Hazard Areas, to change Zone Designations, to add Base Flood Elevations, to change Zone Boundary Line Designations, to add Street Names, and to add Streets.

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE
400 0 400 800 FEET

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
NEWPORT, OREGON
LINCOLN COUNTY

PANEL 2 OF 3
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
410131 0002 C

MAP REVISED:
JUNE 15, 1982

federal emergency management agency

APPENDIX F

DRAFT ENVIRONMENTAL ASSESSMENT
NOAA Marine Operations Center - Pacific Homeport Site Alternatives

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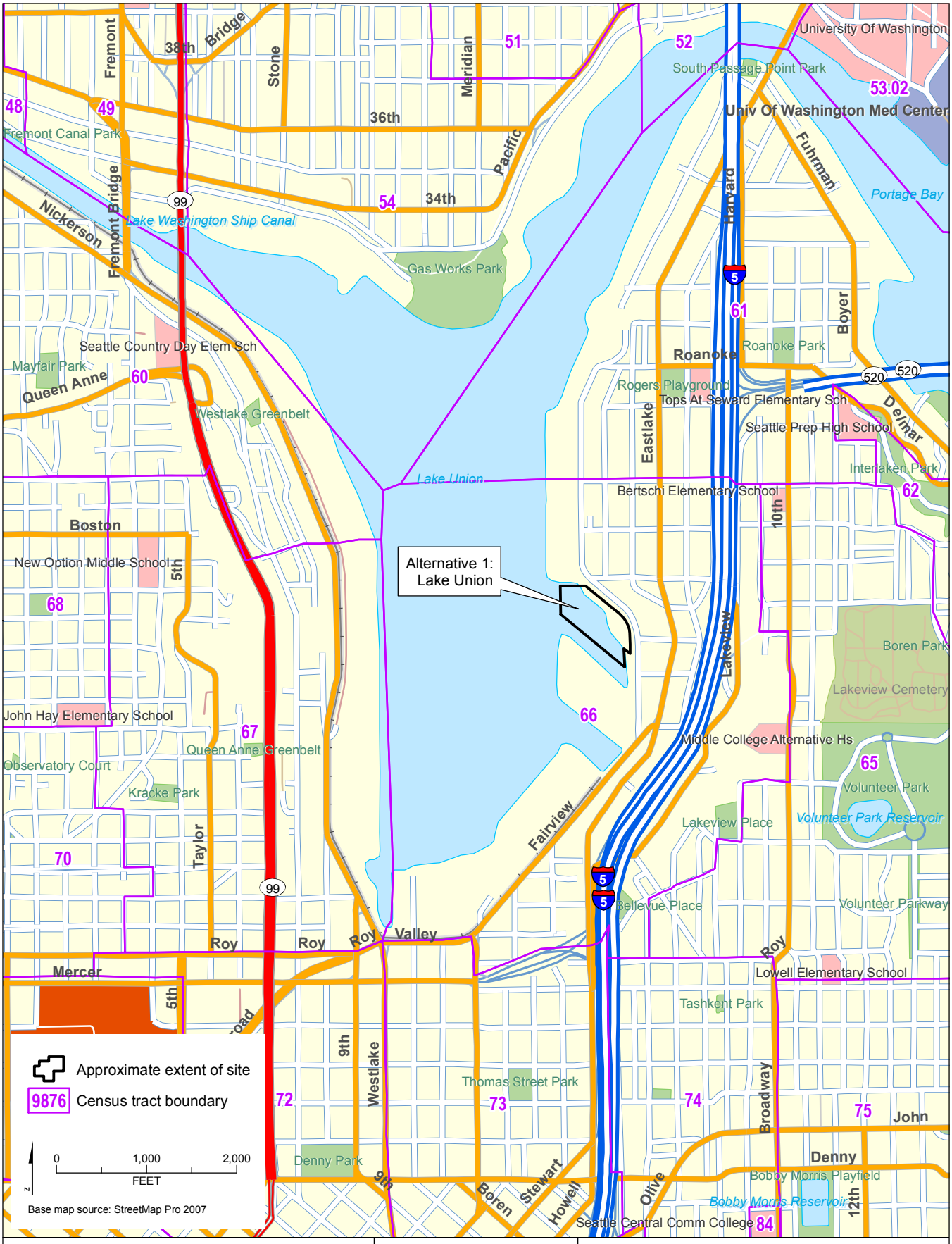
Census Tract Maps in relation to Site Alternatives



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Environmental Assessment
NOAA Marine Operations Center
Pacific Homeport Site Alternatives

APPENDIX F-1
CENSUS TRACTS
ALTERNATIVE 1: LAKE UNION

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Environmental Assessment
NOAA Marine Operations Center
Pacific Homeport Site Alternatives

APPENDIX F-2
CENSUS TRACTS
ALTERNATIVE 2: PORT ANGELES

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Environmental Assessment
NOAA Marine Operations Center
Pacific Homeport Site Alternatives

APPENDIX F-3
CENSUS TRACTS
ALTERNATIVE 3: PORT BELLINGHAM

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Environmental Assessment
NOAA Marine Operations Center
Pacific Homeport Site Alternatives

APPENDIX F-4
CENSUS TRACTS
ALTERNATIVE 4: NEWPORT