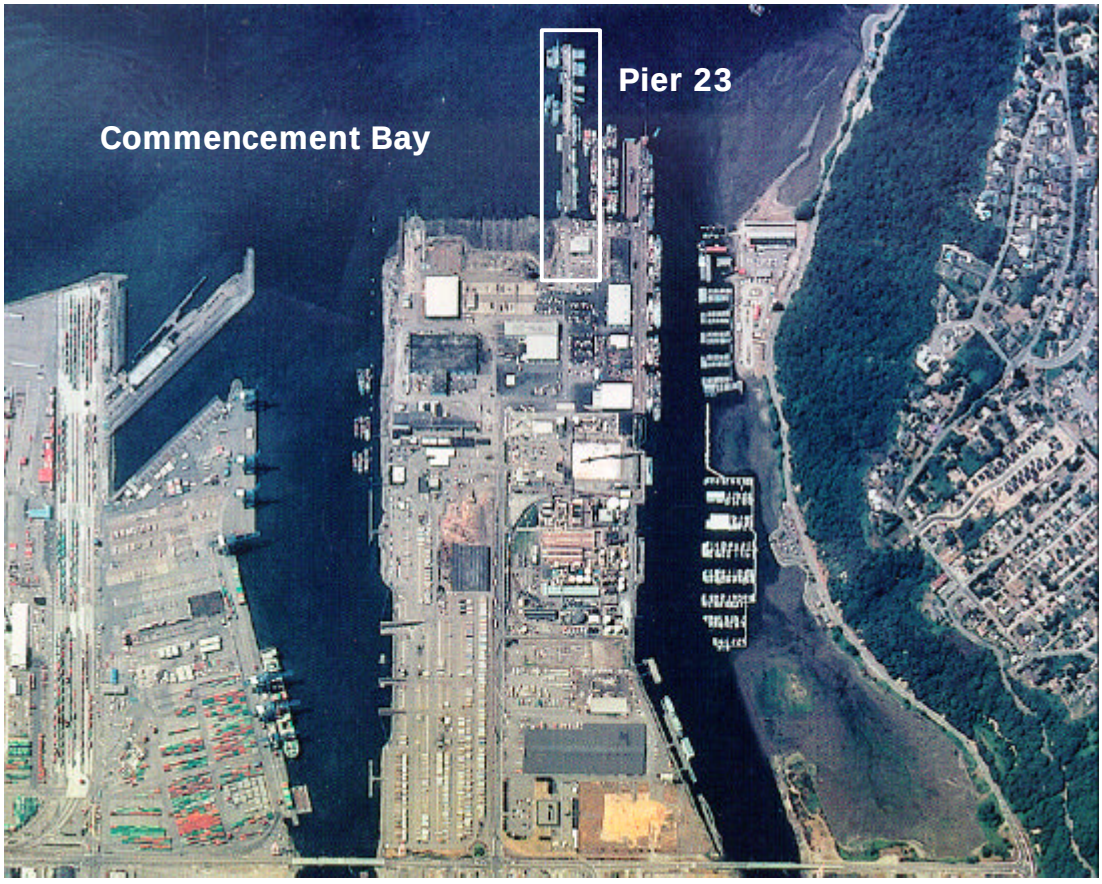
# Revised Biological Evaluation

## Pier 23 Property Upland Redevelopment
## Pierce County, Washington

## October 2001




US Army Reserve
70th Regional Support Command

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# 1. INTRODUCTION

This Biological Assessment (BA) has been prepared to evaluate the potential effects to species listed or proposed under the Endangered Species Act (ESA) from the upgrade and continued operation of facilities at Pier 23 in Tacoma, WA. The Army Reserve is proposing to demolish the existing building on the site, and construct new support buildings. The new buildings will accommodate up to 400 Army Reservists per weekend. The facilities will be used for training, equipment and supply storage, maintenance of equipment and ship components, and general administration.

## *1.1 Location*

The Pier 23 property is located on the northwest end of the Port of Tacoma Industrial Yard, which is situated between the Hylebos and Blair Waterways along the Commencement Bay shoreline (T21N, R03E, Section 27). Please see Figure 1 in Appendix A. Properties directly adjacent to Pier 23 include Tyson Foods shipyard, a warehouse facility, and parking lots to the north and east. The property directly south of Pier 23 includes a number of rails perpendicular to the shoreline, which were once used to launch large ships. Other nearby properties include a yacht manufacturing company, Occidental Chemical, and a metal fabricating operation.

## *1.2 Site Information*

The Pier 23 property is currently used primarily for ship maintenance. Facilities at the property include a pier on 7.4 acres of submerged land and 3 acres of uplands with a warehouse building (Building 580), a temporary trailer structure, a waste storage area, a hazardous material storage area, and parking. The Army Reserve leases the property from the Port of Tacoma. Training of weekend reservists also occurs, but the number of units utilizing the property is low due to the condition of buildings at the site. Pier 23 and associated facilities are required for the training of and are used by the 385$^{th}$ Transportation Battalion, 175$^{th}$ Floating Craft Company, 185$^{th}$ Medium Boat Company, 467$^{th}$ Transportation Terminal, 647$^{th}$ Cargo Documentation Detachment, 804$^{th}$ Movement Control Detachment, and 805$^{th}$ Logistics Support Vessel.

Pier 23 is surrounded by the Commencement Bay/Nearshore Tideflats (CBNT) Superfund site, but has not been listed as part of the Superfund site. Sediment sampling of the Pier 23 property's submerged lands indicates that two areas exceed the Washington State Sediment Management Standard biological criterion for total petroleum hydrocarbons. Screening levels for arsenic and zinc were occasionally exceeded in these areas but were below the minimum cleanup levels for Puget Sound. The Army Reserve is engaging in a cleanup supervised by the Washington State Department of Ecology (Ecology) as part of their MTCA Voluntary Cleanup Program (VCP). As part of this cleanup, an estimated 5,900 cubic yards of sediment will be removed and taken to an approved disposal site. Recent testing indicates that the sediments to be removed have low levels of contamination and can be disposed of at approved landfill sites (PNL 1999). However, detailed remediation plans are not yet available, so the sediment cleanup is not included as part of the proposed action evaluated in this document.

### *1.3 Project Purpose and Need*

The proposed site renovation is intended to provide facilities that are safe, economical, and adequate for the effective, realistic, and meaningful training exercises that the Army Reserve must conduct to meet their readiness and mobilization missions. The existing facilities at Pier 23 are substandard, costly to maintain, and do not meet existing training needs. The facilities were constructed prior to World War II and are in a state of disrepair.

The Washington State Reserve Facilities Board has determined that there are no Federal, state, or privately-owned facilities within the area that could accommodate these Reserve units at a comparable cost. Most training is currently carried out at Kandle Hall, another U.S. Army Reserve Command facility located in Tacoma. However, the Kandle Hall facility is currently operated at levels above design capacity. In addition, the training of reservist units which utilize the Pier 23 property requires regular access to docked vessels as the units specialize in marine transportation and vessel maintenance.

## 2. PROPOSED PROJECT

The new Army Reserve Center facilities would accommodate up to 400 Army Reservists per weekend with the space and areas required to conduct training as integral units. The larger facilities would also allow for development of teamwork needed for readiness and mobilization operations, and missions that do not occur on vessels. Unit personnel require functional and organizational space to conduct administration and training, and to store equipment and supplies. Assembly, classroom, medical, and physical fitness spaces are needed to support the training missions of the units. Maintenance and maintenance training would also be conducted in a new building.

Specific components of the proposed project are shown in Figures 2 - 8 (Appendix A) and described below.

- Demolish Building 580 and remove the adjacent temporary trailer structure (shown in Photo 1 and 2 in Appendix B). All construction debris generated from demolition would be handled from the upland portion of the property and disposed off-site; materials will be kept from falling into the water. Minor amounts of asbestos, lead paint, and polychlorinated biphenyls (PCBs) from fluorescent light fixtures were inventoried in Building 580 and would be handled and disposed of according to state and federal regulations. The demolition phase is expected to take 8 weeks.

- Install steel sheet piling around the northwest and southwest perimeters of the property to prevent bank failures (see Figures 4, 5, and 8). Soils of the site are unstable, unconsolidated fill that will not be able to support the weight of new facilities without stabilization measures. The sheet pile would be placed landward of the mean higher high water (MHHW) depth contour to maximize the buildable area of the property while minimizing impacts to shoreline habitat. Piles will be driven through the existing fill material to a depth approximately 25 feet below existing surface grade. An average of 6 feet of shoreline waterward of the sheet pile alignment will remain undisturbed. The sheet piles will be closest to the shoreline at the pier, where they will be driven directly landward of an existing, highly deteriorated wooden bulkhead fronted by some rip rap. The purpose of the sheet pile retaining wall is to prevent rotational bank failures and major slumping events, not shoreline erosion. One portion of the

shoreline, a section of nearly vertical slag adjacent to the pier (see Photo 3), has been actively cracking and slumping since the 2/28/01 Nisqually earthquake. The driving of piles in this area may exacerbate the failure, which appears to be leading towards a more gently graded shoreline. A large concrete slab adjacent to the existing pier (shown in Photo 3 and 4) will be removed prior to installation of the sheet pile. A hammer or vibratory pile driver working from the landward side of the retaining wall will be used to perform this work, which is expected to take 4 weeks to complete.

- Excavate the existing property surface in order to remove existing asphalt layers and any miscellaneous surface debris. Trenches for removing existing underground utilities (e.g., sewage mains, water lines) and installing new utilities will also be excavated. The surface excavation will likely remove the top one to two feet of pavement/soil. An estimated 6,200 cubic yards of material will be excavated. Any materials unsuitable for reuse at the site will be disposed off-site in an approved upland facility.

  As part of the excavation work, some soils on the southwest portion of the property with very high levels of total petroleum hydrocarbons (TPH) will be removed. An above-ground oil storage tank was removed from this area in 1989. The Army Reserve is currently working under the supervision of the Washington Department of Ecology (Ecology), through the Voluntary Cleanup Program (VCP), to characterize the spatial extent of the contamination and develop/conduct remedial actions which will bring the site into compliance with Model Toxics Control Act cleanup standards. As part of the VCP, the Army Reserve will install wells to monitor groundwater for TPH and other priority pollutants.

  Since the depth to groundwater at the site is estimated to be approximately 8 feet below surface grade, dewatering will be required during the excavation of some of the underground utility trenches. Due to the intensity of historic and current industrial activities on this and adjacent properties, and the quantity of Asarco slag on the property, groundwater samples collected at the site have elevated levels of some heavy metals. The first groundwater pumped from any trenches will be stored above ground and tested for priority pollutants. The testing results will be transmitted to the Ecology VCP site manager. Depending on the concentrations detected, the groundwater will be discharged to the City of Tacoma sewerage system or transported off-site in a tanker truck and treated/disposed under guidance from Ecology. At no time will any pumped groundwater be discharged to surface waters.

- Upgrade the property's stormwater drainage system, and other underground utilities such as telecommunications/lighting/electrical systems. Currently, most stormwater from the Pier 23 property is discharged directly into Commencement Bay. Major underground site work includes the installation of a new stormwater system, consisting of a new outfall, oil-water separator, and associated lines. The stormwater system upgrades will result in a significant reduction of oil and grease runoff from the site.

  The new oil-water separator will be installed directly landward of the portion of the sheet pile retaining wall directly adjacent to the existing pier (see Figures 5, 6, and 7). The separator will discharge into a wet well equipped with a pump to handle high flows and supplement gravity flows during high tides. The new stormwater outfall, which will consist of two distinct outlet pipes, will penetrate the retaining wall just waterward of the wet well. A 450 mm gravity-fed pipe will replace the existing, crushed stormwater outfall at +7.7' MLLW. It will be fitted with

an elastomeric ("duck bill") check valve to prevent back flow into the oil-water separator during high tides. A 100 mm auxiliary pipe will be located at +14.8' MLLW; this outfall will be fed by the pump in the wet well during periods of high capacity and will augment gravity flows during high tides. Having an extra outfall pipe fed by a pump will reduce the likelihood that heavy rainfalls would necessitate a bypass of the oil-water separator such that stormwater would be discharged from the site without treatment. Maintaining the separate, gravity-fed outfall will reduce the likelihood that a mechanical pump failure would result in a system bypass.

The outfall pipes will be placed beneath the pier, in the vicinity of the existing, highly deteriorated outfall. The old outfall will be removed if it is easily accessible, but not if extensive excavation would be required. If the old outfall is not removed, it would be disconnected from all drainage lines. This portion of the shoreline is stabilized by a highly deteriorated wooden bulkhead fronted by some small rip rap. Outfall installation will begin after the sheet piles have been driven. The most landward planks on the pier will be removed so that heavy machinery can access the work area from above, rather than from intertidal habitat beneath the pier. A small trench will be excavated waterward of the sheet pile during low tide; between 10 and 20 cubic yards will be removed. Some rip rap and a portion of the wooden bulkhead will need to be removed from the area in order to excavate the trench. The rip rap will be temporarily sidecast onto adjacent rip rap surfaces, and any wood will be removed and disposed of at an approved upland location. Care will be taken to minimize any discharges into Commencement Bay during this trenching. If the entire wooden bulkhead collapses and requires removal, it will not be replaced. Appropriately-sized holes will then be burnt into the sheet piling to pass pipe sleeves (see Figure 7). The pipes will be pressed through the sleeves from the landward side. Rip rap stones removed from the area during trenching will then be returned to the area surrounding the lower outfall. No additional rip rap will be placed. Personnel will then work, using only hand tools, from the waterward side of the sheet piles to ensure casing seals and properly fitted, and to install the elastomeric check valves. A much larger hole will then be dug landward of the sheet pile, and the pre-cast oil-water separator and wet wells will be installed (see Figure 6).

The only other utility pipe which will penetrate the sheet pile retaining wall is a forced sanitary sewer main. This pipe will penetrate the sheet pile at +12.8' MLLW. Currently, portable toilets are used on the pier. As part of future pier upgrades, improved restroom facilities and pipes discharging to the City of Tacoma sewage system will be installed. During the proposed project, the landward mains will be installed, the sheet pile penetration will be burnt, and the pipe will be slipped through. It will be capped just waterward of the piling, and will be connected to mains running along the pier during a future upgrade project (see Section 2.2 below). The future pier upgrade work will be evaluated in a future Section 7 consultation.

- Construct and utilize new buildings on the upland area. The proposed new buildings would be approximately three stories high, and would total 66,359 $ft^2$ in size. The buildings will be permanent structures with reinforced concrete foundations and floor slabs, structural steel frames, architectural standing seam metal roofs. To provide building foundation support, steel pipe piling will be driven an average depth of 89 feet using an impact hammer pile driver.

- Install a 2" diameter PVC intake pipe running from along the pier into the newly-constructed machine shop. A dynamometer used for engine tests will pump water from Commencement

Bay into the machine shop through this intake. The intake pipe will run along the top of the pier, then make a 90° bend down to the water surface. The intake will be covered with mesh to prevent fish from being sucked into the system. The dynamometer pumps water at a rate of 150 to 250 gallons per minute, and is normally used less than four times a year. During each use, it may run continuously for up to 40 hours. Currently, the dynamometer and intake pipe are located on a barge docked at the pier. Discharges from the dynamometer, which may have temperatures 30°F higher than Commencement Bay, are now released directly into surface waters. The engine test operations currently occuring on the barge will be moved to the new machine shop once construction is complete. As part of the move, dynamometer discharges will be routed to the new stormwater system, where they will be held and diluted in the 19,000 liter oil water separator prior to discharge. This will allow discharges to cool to ambient temperature prior to release into surface waters.

- Install general site and infrastructure improvements, including paving, fencing, and landscaping. Some areas currently surfaced with gravel will be paved, resulting in a small increase in impervious area. All resultant runoff will be passed through the new oil-water separator. The Army Reserve coordinated with the City of Tacoma's Wastewater Management Source Control specialist to ensure that stormwater generated on the property is properly treated.

Temporary construction trailers will be on site during the construction. The existing employee lunch trailer will be relocated, on site, until the new facilities are occupied. Any petroleum products or other hazardous materials stored on site during construction will be handled in a safe and proper manner, as dictated by the Pollution Prevention Plan developed for the facilities' National Pollutant Discharge Elimination System (NPDES) permit. A refueling truck will visit the site at regular intervals for the fueling of construction equipment, but any required routine maintenance will be performed off site.

The Army Reserve would like to begin construction associated with the proposed action during winter 2001. Since installation of the sheet pile retaining wall and new stormwater outfall are among the first construction actions scheduled, it would be necessary to begin construction in January to ensure that all shore-side work is complete by the beginning of the bull trout in-water work closure period (February 16). Otherwise, all other work will be delayed until July 16. Construction should be complete between 12 and 24 months after work at the site begins.

During construction, vessel operations and maintenance would continue along the existing pier structure. After construction is complete, most maintenance operations would be moved to the new facilities. This includes most of the hazardous material sheds and tanks currently located on the pier. These storage facilities, used to store oil, anti-freeze, paints, solvents, and batteries, are self-contained and designed specifically for hazardous materials (i.e., lighted, heated, ventilated, and explosion-proof with fire suppression capabilities).

After construction is complete, Army Reserve personnel would continue to train at the Pier 23 property one or two weekends per month. The number of Army Reserve personnel at the new ARC during training weekends would be approximately 400 members. Overflow parking would be provided on the adjoining Port of Tacoma property when weekend training exercises are scheduled.

The number of full-time personnel utilizing the Pier 23 facility during weekdays and on weekends would increase from 30 to approximately 50.

### *2.1 Conservation Measures*

Several measures will be employed during construction to minimize adverse project effects on protected species:

- All work with the potential to result in minor discharges to surface waters, including the removal of the concrete slab, installation of sheet pile retaining wall, and installation of the new stormwater outfall, will not occur during the height of the juvenile salmon and bull trout migration periods (February 15 – August 15). In the event that a discharge does occur, the potential for any harm to listed fish species attributable to increased turbidity or contaminant resuspension will be low.

- The sheet pile alignment is several feet landward of the existing shoreline. This alignment serves to maximize the buildable area of the property while minimizing impacts to shoreline habitat.

- Since the Army Reserve will be generating/handling petroleum products and other contaminants routinely, the careful management of stormwater runoff will be important for pollution prevention. Stormwater system upgrades will improve current conditions by separating oil and grease from runoff prior to discharge into Commencement Bay. Water that is used for engine tests will also be discharged to the new stormwater system, which will reduce wastewater temperature prior to discharges to Commencement Bay. The facility will continue to operate in accordance with the Pollution Prevention Plan developed for their NPDES permit.

- Precautions will be taken to prevent the discharge of petroleum products, chemicals, or other material into Commencement Bay. Equipment and work vehicles will be stored on-site during construction; however, refueling will occur away from the water. No breakdown maintenance on engines will occur near the water. Fuel spill kits with absorbent pads will be onsite at all times.

- Appropriate measures would be implemented as part of the construction to control stormwater and sediment runoff, and resuspension of sediments within the bay. Standard erosion control methods (e.g. silt fences) will be a requirement of contract documents.

- During operation of the new facilities, wash water used in the cleaning of machines and equipment would not be discharged into surface waters except as authorized by a NPDES discharge permit. Wash water will outfall through the newly installed storm water and oil-water separator system.

- Precautions will be taken to prevent construction debris from entering Commencement Bay during the demolition and building process. Demolition activities will occur above the MHHW depth contour, and as far away from the water's edge as possible.

### *2.2 Future Actions on the Pier 23 Property*

Pier 23 is in a state of disrepair and needs to be replaced. The Army Reserve is planning to remove a 634 foot long pre-World War II wood surfaced section of the existing pier structure and replace it with a new concrete-surfaced pier on concrete pilings. However, this work is complicated by sediment contamination under the pier (as described in Section 1.2). Since detailed plans for sediment remediation work are not yet complete, potential effects of the pier/remediation work are not addressed in this BE. A separate Section 7 consultation will be initiated once complete plans are available. The pier reconstruction and sediment remediation work will begin no earlier than 2004.

The Army Reserve has decided to move forward with the upland work so that construction sequencing for facility improvements will provide for an efficient use of resources. By phasing the work in this manner, the facilities currently located on the pier will be moved to the new upland buildings before removal of existing pier. After completion of the proposed buildings, many of the maintenance facilities and storage areas currently on the pier will be permanently moved to the new upland facilities. As part of the pier phase of this work, shoreline improvements will be made. Slag material and abandoned creosote pilings will be removed, and native species will be planted waterward of the sheet pile wall alignment.

## 3. DESCRIPTION OF THE PROJECT AREA AND ACTION AREA

### *3.1 Pier 23 Property*

Army Reserve facilities at the Pier 23 site include two distinct but connected areas: (1) a 1,134 foot long pier located on 7.4 acres of submerged land; and (2) 3 acres of attached headlands that contain a warehouse building (Building 580), temporary trailer structure, hazardous material storage area, waste storage area, and parking area. See Figures 1 and 2 in Appendix A.

The upland portion of the project area slopes very gently to the northwest, toward Commencement Bay. Most of the land surface in the vicinity of Building 580 is paved. Exposed soil, fill material, and weeds occupy a narrow area along the southeastern border and southern shoreline. A chain link fence surrounds the upland borders of the property. Building 580 is a 15,000 $ft^2$ two-story warehouse facility constructed by the Navy prior to World War II. It consists of a heavy wooden framework with an exterior of aluminum siding and a metal roof. The building is in an advanced state of disrepair, and the roof leaks in several locations. A small portion of the building is used as classroom/training space and storage; however, most of the building has been vacant for several years due to its deteriorated condition. Please reference the photographs in Appendix B.

Most of the shoreline is covered with concrete reinforced riprap. The bank directly adjacent to the south side of the pier is composed of industrial slag from the Asarco smelter, concrete rubble, decaying creosote piles, and other fill material. South of this fill bank and continuing onto the adjacent property, there is an intertidal zone composed of gently sloping mudflat. The shoreline of the project site lacks overhanging vegetation. Please reference the photographs in Appendix B.

The pier is composed of a wooden section constructed prior to World War II, and a concrete extension that was added in 1946. The total length of the pier is 1,134 feet with a mean width of

approximately 56 feet. The wooden section is supported by approximately 500 creosote-infused timber piles. Several Army Reserve office and maintenance/storage trailers are located on the concrete surface. A large (150 ton) floating crane is situated on the south side at the end of the pier and is used to haul small vessels onto the pier for maintenance. An Army-owned floating dock structure is attached to the end of the pier along the north side and is used for mooring 14 vessels. In total, 32 vessels are currently moored along the pier, ranging in size from 60 ft to the 237 ft long Logistics Support Vessel. The foot of Pier 23 is directly connected to the upland portion of the site. Please reference the photographs in Appendix B.

### *3.2 Action Area*

The most widespread effect of the proposed action will be the water quality improvements associated with stormwater system upgrades at the site. The Action Area for the proposed upland work is therefore defined as the immediate project site to the end of the existing pier, southwest to the Blair Waterway and northeast to the Hylebos waterway, along with the nearshore waters of Commencement Bay.

### *3.3 Environmental Baseline*

Commencement Bay is a deep-water embayment of approximately 5,700 acres near Tacoma, Washington. The mean tidal range in Commencement Bay is 8.1 feet (USACE 1983); mean higher high water (MHHW) is 11.8 feet above the mean lower low water (MLLW) datum. The waters are deep throughout the bay, with a maximum depth of 540 feet near the entrance. The nearshore waters shoal abruptly to remnant mudflats that become exposed during ebb tides. Commencement Bay has significant freshwater and sediment inflow from the Puyallup River and, to a lesser extent, Hylebos and Wapato creeks.

The City of Tacoma is situated on the bay's south and southeast shores. Residential portions of northeast Tacoma and the Brown=s Point section of Pierce County occupy the north shore of the bay. Shoreline owners include the City of Tacoma, Port of Tacoma, Pierce County, the State of Washington, the Puyallup Indian Tribe, and numerous private entities. Much of the publicly owned land is leased to private industrial and commercial enterprises.

*Historic Conditions*

The lower Puyallup was once a broad, shallow meandering river bordered by marshes and connected to the rest of the nearshore habitat of the bay by a system of tidal creeks. These tidal creeks provided channels for estuarine water to move across mudflats and into and out of tidal marshes. This allowed for the distribution of sediment and nutrients throughout the ecosystem. Tidal creeks also provided access routes for estuarine organisms such as juvenile salmonids.

The earliest reports, including photography and maps, indicate that in 1877 the area bound by MLLW and MHHW was intertidal mudflat (Hart Crowser 1975; Bortleson et al. 1980). This area encompassed approximately 1,829 acres. Mudflat habitat, typically devoid of emergent or vascular plants, probably would have maintained dense populations of green algae. Vegetated shallows were apparently scarce to absent in most of the bay (Thom 1991). The high volume of sediment deposited by the Puyallup River would have caused heavy silting, which limits eelgrass bed development. The Corps et al. (1993) estimated that between 2,471 to 3,890 acres of emergent marsh existed on the Puyallup Delta extending up to present-day Interstate Highway 5.

*Current Conditions*
Today, the Puyallup River is channelized throughout historic estuary. Concrete-lined levees direct the flow of the river and prevent it from overflowing. Creation of waterways through dredging, and filling of nearshore areas significantly altered the estuarine nature of the bay since the 1920s. In 1887, Commencement Bay contained extensive acreage of intertidal salt, brackish, and freshwater habitats. By 1995, only 1 to 2 percent of the original habitat remained in Commencement Bay (USFWS et al. 1996).

Numerous industrial and commercial operations have occupied the filled areas of the bay during its development. Such operations have included cargo handling and storage, marine construction, shipbuilding, maintenance and repair, marina operations, petroleum, chemical, paper/pulp and concrete manufacturing.

Shoreline Conditions. Common shoreline features within the action area include bulkheads with structures such as piers, wharves, and buildings extending over the water, and steeply sloped banks armored with riprap, concrete slabs, and woody and miscellaneous debris. Intertidal habitat is dominated by such industrial waterfront features. At Pier 23, little vegetation is present on the upper portions of the shore (see Photo 5). The shoreline is composed of industrial slag material (from the Asarco smelter) in addition to concrete, fill dirt, and bricks. Below this artificial bank is a mix of silt and crumbled slag that transitions to mudflat in the lower intertidal zone. Portions of the bank are reinforced with debris ranging from cobbles, to refractory bricks to old timbers.

Bathymetry. Relative to historic conditions, the waterways have a relatively constant depth at mid-channel. Waterway slopes vary from steep (along most dredged and armored waterway shorelines) to shallow (along remnant mudflats and sand flats). Along major dock faces, the mid-channel depth generally extend shoreward to include major berthing facilities or areas. Remnant mudflat habitat is found in the lower half of the Hylebos Waterway, in most of St. Paul Waterway, in two-thirds of Middle Waterway, along the Ruston-Point Defiance shoreline, at the mouth of the Puyallup River, and near the mouth of the Hylebos Waterway. At Pier 23, waterward of the near-vertical slag banks, the surface grade gently slopes to a depth of about 35 feet and then levels off near the end of the pier.

Substrate. The intertidal and subtidal zones of the project area are dominated by fine silts and decomposed slag. Iron rails are embedded in the substrate, perpendicular to the shoreline, just south of the Pier 23 property where shipbuilding facilities were once located.

Water and Sediment Quality. Water quality in Commencement Bay has experienced a significant decline in the past 70 years due to hazardous and non-hazardous runoff from industry, homes, and municipalities. The bay and waterways are the receiving waters for treated and untreated industrial, commercial, and municipal discharges. Inner Commencement Bay is on the 1998 303(d) list of Impaired and Threatened Water Bodies in Washington due to elevated fecal coliform levels, low dissolved oxygen, and the presence of a number of contaminants in bottom sediments. As discussed in Section 1.2, the Pier 23 property is surrounded by the Commencement Bay/Nearshore Tideflats Superfund site. A large portion of the sediments in Commencement Bay are contaminated with metals, including arsenic, lead, copper, and mercury, and organic compounds including polychlorinated biphenyls (PCBs), dibenzofurans, chlorinated pesticides, phthalates, and polycyclic

aromatic hydrocarbons. Adjacent to Pier 23, elevated levels of total petroleum hydrocarbons, arsenic, and zinc have been detected.

Biota. Remnant vegetated shallows are located along the mouth of the Hylebos Waterway towards Brown=s Point, and in patches along the Ruston-Point Defiance shoreline. There are currently no intertidal emergent marsh habitat or eelgrass beds in the project vicinity. The fine silt and slag substrates on the Pier 23 property do not provide adequate attachment substrate for macroalgae; some macroalgae is present on pier pilings and the rip rap/concrete debris that lines parts of the shore. Since there are no native vegetation communities in this area of the bay, there is likely a lack of detritus input. The gradually sloping intertidal mudflat beneath and southwest of the pier appears to offer the best juvenile salmonid habitat in the project vicinity (see Photo 5). The mudflat extends along the width of the Port of Tacoma property, southward to the Blair Waterway. The north side of the pier is dominated by a large block of slag in the intertidal zone, which likely provides no habitat for juvenile salmonids.

A variety of forage fish utilize Commencement Bay adjacent Puget Sound waters. Sand lance spawning occurs on beaches near the lighthouse at Brown's Point, near the lighthouse at Dash Point, and on a small pocket beach in southern Commencement Bay along Ruston Way. Surf smelt spawning has been documented on the beach near the Brown's Point lighthouse. Pacific herring spawning occurs along the southeastern shoreline of Vashon Island and southern Maury Island. Herring holding occurs in Dalco Passage. Please see Figure 9 in Appendix A.

## 4. AFFECTED SPECIES

Six species protected under the Endangered Species Act of 1973 (16 USC 1531-1544) potentially occur in the project vicinity (see Table 1.). A list of species potentially affected by the proposed project was received from the U.S. Fish and Wildlife Service (USFWS) on December 27, 1999 (FWS Ref: 1-3-00-SP-0163). National Marine Fisheries Service (NMFS) Northwest Region web sites (*http://www.nwr.noaa.gov/1habcon/habweb/listnwr.htm* and *http://www.nwr.noaa.gov/1seals/marmamlist.html*) were consulted to determine which species under NMFS's jurisdiction potentially occur in the project area. Table 1 summarizes the information received from USFWS and NMFS.

The likelihood that a humpback whale or leatherback sea turtle would occur in Commencement Bay, particularly in a shallow nearshore area adjacent to a large pier with several boats moored to it, is extremely low. Given their distribution and the lack on in-water work, the Army Reserve has determined that the proposed project would have **no effect** on these species or the designated critical habitat of the leatherback sea turtle.

**Table 1. Protected Species Potentially Occuring in the Project Vicinity**

| Species | Listing Status | Critical Habitat |
|---|---|---|
| Bald Eagle<br>*Haliaeetus leucocephalus* | Threatened | — |
| Coastal/Puget Sound Bull Trout<br>*Salvelinus confluentus* | Threatened | — |
| Puget Sound Chinook Salmon<br>*Oncorhynchus tshawytscha* | Threatened | Designated |
| Steller Sea Lion<br>*Eumetopias jubatus* | Threatened | Designated |
| Humpback Whale<br>*Megaptera novaeangliae* | Endangered | — |
| Leatherback Sea Turtle<br>*Dermochelys coriacea* | Endangered | Designated |
| Puget Sound/Strait of Georgia Coho Salmon<br>*Oncorhynchus kisutch* | Candidate | — |

## 5. EVALUATION OF PROJECT IMPACTS ON PROTECTED SPECIES

### *5.1 Bald Eagle*

The Washington State bald eagle population was listed as threatened under the Endangered Species Act of 1973, as amended (64 FR 16397), in February 1978. Since DDT was banned in 1972, bald eagle populations have rebounded. The bald eagle was proposed for de-listing in July 1999.

The bald eagle wintering season extends from October 31 through March 31. Food is recognized as the essential habitat requirement affecting winter numbers and distribution of bald eagles. Other wintering habitat considerations are communal night roosts and perches. Generally large, tall, and decadent stands of trees on slopes with northerly exposures are used for roosting; eagles tend to roost in older trees with broken crowns and open branching (Watson and 1998). Bald eagles select perches on the basis of exposure, and proximity to food sources. Trees are preferred over other types of perches, which may include pilings, fence posts, powerline poles, the ground, rock outcrops, and logs (Steenhof 1978).

Bald eagles nest between early January and mid-August. The characteristic features of bald eagle breeding habitat are nest sites, perch trees, and available prey. Bald eagles primarily nest in uneven-aged, multi-storied stands with old-growth components. Factors such as tree height, diameter, tree species, position on the surrounding topography, distance from water, and distance from disturbance also influence nest selection. Snags, trees with exposed lateral branches, or trees with dead tops are often present in nesting territories and are critical to eagle perching, movement to and from the nest, and as points of defense of their territory.

Birds and fish are the primary food source for eagles in Puget Sound, but bald eagles will also take a variety of mammals, and turtles (both live and as carrion) when fish are not readily available (Knight et al. 1990). Eagles in tidally influenced habitats also scavenge and pirate more prey than do eagles

at rivers or lakes, possibly resulting form expanded feeding opportunities provided by dead and stranded prey on tide flats (Watson and Pierce 1998).

*Utilization of the Action Area*
There are no freshwater wetlands in the project area that could attract waterfowl, which in turn could attract foraging bald eagles. In addition, there is little native vegetation near the project and no trees that could be used as perch sites. Bald eagles may occasionally travel through the area or, on a rare occasion, may hunt for fish just offshore of Pier 23. Because of the industrial nature of the site, the high level of human activity and boat traffic, and the accessibility of better habitat close to Commencement Bay, frequent bald eagle use of the site is unlikely.

A query of the Washington State Wildlife Heritage Database indicated that there are several bald eagle nests within a six mile radius of the project site. Three nests are located along the shore northeast of the project, the closest being 2.75 miles from Pier 23. Three nests are located inland of the Pier 23 property, the closest being 4.5 miles south of the project area. Several nests are located on Point Defiance (about six miles to the northwest) and on southern Vashon Island (about fives miles to the northwest). No known communal night roosts are located in or near the project area.

*Effects of the Proposed Action*
Project construction would extend over the course of one to two years, so activities would occur during the bald eagle wintering and nesting seasons. Pile driving will likely be the activity that generates the most noise during construction. USFWS guidance suggests that noise associated with pile driving may disturb eagles up to a mile away (USFWS 1999). The closest eagle nest is approximately 2.75 miles from the site, so construction activities are not expected to directly disrupt eagle nesting and rearing of young. No communal night roosts or perch trees would be affected, as none are present near the site.

Foraging bald eagles may be temporarily displaced by the noise of heavy equipment, but the availability of prey will not be significantly disrupted by project construction. Eagles tend to tolerate more disturbance at feeding sites than in roosting areas (Steenhof 1978). Since eagles are transient in nature, they will naturally move to another perch site if disturbed (Fielder 1997).

*Effect Determination*
The proposed project **may affect, but is not likely to adversely affect** the bald eagle, since construction activities will not occur near breeding or wintering areas. Noise associated with construction activities have the potential to disrupt feeding opportunities in a localized area, but this project would not alter the long-term food base.

### *5.2 Coastal/Puget Sound Bull Trout*

The Coastal/Puget Sound bull trout population segment was listed as a threatened species under the Endangered Species Act of 1973, as amended, in October 1999. Bull trout populations have declined through much of the species' range; some local populations are extinct, and many other stocks are isolated and may be at risk (Rieman and McIntyre 1993). A combination of factors including habitat degradation, expansion of exotic species, and exploitation have contributed to the decline and fragmentation of indigenous bull trout populations.

Bull trout and Dolly Varden (*S. malma*) are two closely related char species native to the Pacific Northwest and western Canada. The taxonomy of the species is difficult and it was only in 1978 that the two separate species were recognized (Cavender 1978). The Washington Department of Fish and Wildlife (WDFW) manages the species together as "native char" because bull trout and Dolly Varden can be readily distinguished only by genetic testing. Washington's native char exhibit four life histories: anadromous, adfluvial, fluvial, and resident. The least information is available on the anadromous form of bull trout, but it is assumed that they occur in a number of Puget Sound basins, possibly as far south as the Puyallup River (McPhail and Baxter 1996).

Bull trout movement in response to developmental and seasonal habitat requirements make their movements difficult to predict both temporally and spatially. A recent WDFW (1999) summary paper on bull trout in Stillaguamish Basin provided some general information on bull trout distribution in Puget Sound river basins. Newly emergent fry tend to rear near spawning areas, while foraging juvenile and sub-adults may migrate through river basins looking for feeding opportunities. Post-spawn adults of the non-resident life form quickly vacate the spawning areas and move downstream to forage, some returning to their "home" pool for additional rearing. Anadromous sub-adults and non-spawning adults are thought migrate from marine waters to freshwater areas to spend the winter.

*Utilization of the Action Area*

Little data is available on the life history and distribution of bull trout in Puget Sound river basins (WDFW 1998). The 1998 WDFW Salmonid Stock Inventory recognized three stocks in the Puyallup River bull trout/Dolly Varden subpopulation: the Puyallup, White River, and Carbon River. It is unknown if these stocks are genetically distinct. These stocks are native, but no life history information is available. WDFW considers habitat for anadromous, fluvial, and resident forms to be available within the Puyallup basin (WDFW 1998). Urban development, agriculture, and logging have been identified as threats to native char populations within the Puyallup River basin.

Anadromous sub-adults and adults utilize estuarine and nearshore marine habitats in Puget Sound for the feeding opportunities these areas present. Any bull trout occuring in the action area would not be resident fish, but individuals on foraging forays. Based on research in the Skagit Basin (Kraemer 1994), anadromous bull trout juveniles migrate to the estuary in April-May, then re-enter the river from August through November. Most adult fish entered the estuary in February-March, and returned to the river in May-June. Sub-adults, fish that are not sexually mature but have entered marine waters, move between the estuary and lower river throughout the year.

*Effects of the Proposed Action*

Short-term impacts from construction-related disturbance may occur but, as discussed below, they are expected to be insignificant. The net effect of the proposed action will be beneficial: stormwater system upgrades will improve water quality in adjacent waters; the removal of TPH-contaminated soils will reduce the potential for petroleum hydrocarbons to be transported to groundwater and subsequently to surface waters; and the removal of hazardous material storage facilities from the pier will reduce the potential for accidental spills to reach surface waters.

The proposed work will not affect spawning, rearing, or refuge habitat. No trees or shrubs along the shoreline will be removed during construction, as the sheet pile retaining wall will be installed landward of the one vegetated portion of the site. Generally, most of the construction activities at the site are expected to have little, if any, impact on the waters and nearshore habitats of Commencement Bay. Demolition of the existing buildings and construction of the new buildings will occur about 100 feet from the shoreline. Sedimentation and erosion control measures (e.g., silt fences) will be in place during construction. One of the fist construction tasks will be the installation of new stormwater pipes and the oil/water separator, so most construction runoff from the site will have some level of treatment.

The project is not expected to impede the foraging movements of bull trout. Pile driving associated with foundation work for the new buildings, which will occur during portions of the year when bull trout may be present in waters adjacent to the site, will produce noise above ambient levels. There is a small chance that this noise could serve as a barrier to bull trout movements. However, bull trout tend to forage during twilight hours and at night and construction activities at the site will occur during daylight working hours.

Construction activities occuring directly adjacent to the shore (the sheet pile bank retaining wall work, the removal of the large concrete slab adjacent to the existing pier, and installation of the new stormwater outfall) may temporarily degrade some habitat quality indicators. The relevant indicators and types of impacts anticipated are discussed below.

Shoreline Conditions. Installation of the new stormwater outfall will temporarily modify a small area of intertidal habitat, primarily during trenching operations. However, damage to intertidal mudflat will be minimized by working from the shore above—no heavy equipment will work below the pier. In addition, no new bank protection measures will be introduced. Once installation is complete, the shore beneath the pier will look much like it does today. This impact is therefore expected to be insignificant.

Bathymetry. Given the unstable soils along the northern portion of the pier (see Photographs 3 and 4 in Appendix B), slumping may be accelerated during the sheet pile and concrete removal work. This portion of shoreline has experienced cracking and slumping since the 2/28/01 Nisqually earthquake. The slag mass appears to be seeking a more gently-graded angle of repose. Any slumping caused by the driving of sheet piling approximately 10' landward of the active failure zone would likely be no more dramatic than the ongoing slumping. Only the rate of slumping, not the volume of slag moving, is expected to be altered by the pile driving.

No scour is anticipated to result from the sheet pile installation, since piles will be driven several feet from the shore and no other "hard" structures will be installed.

Water Quality-Turbidity.
If slumping does occur during the removal of the slab and/or the driving of sheet piling, effects on the water column may include increased turbidity and perhaps some contaminant resuspension, as the shoreline is composed of fill from the Asarco smelter. Excavation of the trench in which the stormwater outfall pipes will be placed will result in a minor sediment discharge into Commencement Bay, but the discharge will be minimized by working during low tides.

Due to the potential for construction-related sediment discharges, all shore-side work will occur outside of the USFWS bull trout closure period for in-water work (February 15 through July 15, the portion of the year when bull trout are most likely to be present in marine/estuarine waters) to greatly reduce the likelihood for harm to bull trout. If a bull trout was in the project area during a construction-induced bank failure, it would be a large and mobile fish able to avoid any turbidity plumes. The life history stages requiring the lowest suspended sediment concentration—spawning, incubation, and fry rearing—do not occur in project action area. Any disruptions to benthic production resulting from any construction-related sediment discharges would be temporary and highly localized, therefore having no significant impacts on prey populations.

Water Quality-Salinity Gradients. The sheet pile retaining wall is not expected to appreciably affect groundwater seeps in the project area. The shallow groundwater beneath the project site is influenced by tidal fluctuations. Groundwater flow direction, both at high and low tides, is to the north-northeast. When the sheet piles are first installed, the seams will allow for some seepage. After time, however, the seams will fill with sediment and this transport will be prevented. Since the retaining wall will not block a large area, it is expected that the groundwater will flow towards another discharge path nearby. Therefore, the retaining wall may slow, but will not reduce, the quantity of freshwater transported to Commencement Bay in the immediate project vicinity. This minor effect is not expected to result in a significant change in salinity gradients in the project area.

*Effect Determination*
The proposed project **may affect, but is not likely to adversely affect** bull trout. This determination is based upon the highly localized geographic scope of the project, and the low likelihood that bull trout would be present in the action area during work adjacent to the shoreline.

### *5.3 Puget Sound ESU Chinook Salmon*

The Puget Sound Evolutionarily Significant Unit chinook salmon was listed as a threatened species under the Endangered Species Act of 1973, as amended (64 FR 16397), in March 1999.

Like all other Puget Sound chinook, those observed in Commencement Bay are of the ocean-type race (NMFS 1998). Ocean-type chinook migrate to sea during their first year of life, normally within three months after emergence from spawning gravel. Growth and development to adulthood occurs primarily in estuarine and coastal waters (NMFS 1998). Ocean-type chinook return to their natal river in the fall, though actual adult run and spawning timing is in response to the local temperature and water flow regimes (Myers et al. 1998). After spawning, females remain on the redd from 4 to 26 days until they die or become too weak to hold in the current (Neilson and Green 1981, Neilson and Banford 1983). During this period, females will vigorously defend the redd against the spawning activity of newly arriving fish. Duration of incubation varies, depending on location of redds, but is generally completed by the end of February. Young chinook reside in stream gravels for 2 to 3 weeks after hatching (Wydoski and Whitney 1979) before moving to lateral stream habitats (e.g., sloughs, side channels, and pools) for refugia and food during their migration downstream and out to Puget Sound. Peak emigration occurs from March to June.

The amount of time juveniles spend in estuarine areas is dependent upon their size at downstream migration and rate of growth. Juveniles disperse to deeper marine areas when they reach approximately 65-75 mm in fork length (Simenstad et al. 1982). While residing in upper estuaries as fry, juvenile chinook have an affinity for benthic and epibenthic prey items such as amphipods, mysids, and cumaceans. As the juveniles grow and move to deeper waters with higher salinities, this preference changes to pelagic items such as decapod larvae, larval and juvenile fish, drift insects, and euphausiids (Simenstad et al. 1982).

Designated critical habitat for the Puget Sound ESU Chinook includes all marine, estuarine and river reaches accessible to the species in Puget Sound (NMFS 2000). Critical habitat consists of the water, substrate, and the adjacent riparian zone of accessible estuarine and riverine reaches. Designated critical habitat occurs adjacent to the project site, and throughout the action area for the proposed project.

*Utilization of the Action Area*

Several studies in Commencement Bay indicate that chinook salmon use nearshore habitat before moving out to deeper water of the bay, and eventually toward the open ocean (Puyallup Tribal Fisheries Division unpub; Duker et al. 1983; Miyamoto et al. 1980). Chinook salmon fry appear to congregate at the mouth of the Puyallup River and then disperse along nearshore habitat at the head of the bay. Chinook salmon are generally present between late March and the first week of July in Commencement Bay, with peak numbers between late May and early June (Duker et al. 1983). Relative use of nearshore habitat in the vicinity of Pier 23 was rated "medium" and "high," corresponding to periods before and after the release of hatchery fish. Use of the Hylebos Waterway was rated low (Duker et al. 1983). Young salmon appear to congregate at the head of the longer waterways and avoid the interior waters of these channels. Out-migrating juvenile salmon have shown no apparent preference for the north or south shore of Commencement Bay (Duker et al. 1983).

The WDFW does not have accurate counts of chinook escapement from the Puyallup River system because the high glacial silt load in the lower river makes fish observations difficult. NMFS rates the status of Puyallup River basin chinook salmon stocks as critical in the White River (spring run) and as unknown for the summer/fall run in the White River, Carbon River, and South Prairie Creek (NMFS 1997).

Chinook salmon, and all other wild salmon, have severely declined in number from historic levels in Commencement Bay tributaries due to development and industrialization in the bay, logging, and overfishing. From an estimated historic 844 ha (2,085 acres) of intertidal mudflat and 1,576 ha (3,894 acres) of intertidal emergent marsh, only 76 and 23 ha (187 and 57 acres), respectively, remain in Commencement Bay (USFWS 1991). The salmon production of the estuary in 1988 was estimated to be four percent of the historic potential. Declines in the Puyallup River chinook runs have been documented (Salo and Jagielo 1983), but it is difficult to separate the contribution of the loss of rearing habitat in Commencement Bay from other contributing factors within the basin (USFWS 1991). Other contributing factors to chinook salmon declines include water withdrawals from the river, dam operations, poor logging practices, development of wetland and riparian zones, overfishing, and effects of hatchery fish (Salo and Jagielo 1983; Miller et al. 1990).

*Effects of the Proposed Action*
The effects of the proposed action on chinook will be similar to those described for bull trout. All construction activities directly adjacent to the shoreline (i.e., sheet pile installation, concrete slab removal, stormwater outfall installation) will occur outside of the NMFS closure period for in-water work, March 1 through July 1. This closure period corresponds to the portion of the year when chinook are most likely to be present in nearshore marine waters. Although subyearling and yearling chinook may be present in Commencement Bay year-round, the poor habitat conditions and frequent boat activity make waters adjacent to the project site sub-optimal habitat. Any effects of noise disturbance associated with construction work are expected to be discountable. The net effect of the proposed action will be beneficial: stormwater system upgrades will improve water quality in adjacent waters; the removal of TPH-contaminated soils will reduce the potential for petroleum hydrocarbons to be transported to groundwater and subsequently to surface waters; and the removal of hazardous material storage facilities from the pier will reduce the potential for accidental spills to reach surface waters.

*Effect Determination*
The proposed project **may affect, but is not likely to adversely affect** the Puget Sound ESU chinook salmon. This determination is based upon the highly localized geographic scope of the project, and the low likelihood that chinook would be present in the action area during construction operations directly adjacent to the shoreline. The project **may affect, but is not likely to adversely affect** designated critical habitat for this species.

### *5.4 Steller Sea Lion*

The Steller sea lion was listed as a threatened species under the Endangered Species Act of 1973, as amended (64 FR 16397), in November 1990. In 1997, the North Pacific's population of Steller sea lions was separated into two distinct stocks, one of which was reclassified as endangered. The status of the eastern stock, which includes the population inhabiting the waters of the Washington coast, remains unchanged.

The present range of the Steller sea lion extends from northern Japan, through the Bering Sea and Aleutian Islands, along Alaska's southern coast, and south to California. The centers of abundance and distribution lie in the Gulf and Alaska and Aleutian Islands. Steller sea lions are not known to migrate, but they do disperse widely during portions of the year other than the breeding season. Most information on the distribution of Steller sea lions has been collected during summer months, so their distribution during late fall and winter is poorly known (Steller Sea Lion Recovery Team 1992).

Two types of terrestrial habitats are utilized by Stellar sea lions: rookeries are areas where adults congregate for breeding and pupping, and haul-outs are areas used for rest and socializing. Sites used as rookeries during the breeding season may be used as haul-outs during the remainder of the year. Steller sea lions haul-out on offshore islands, reefs, and rocks, while rookeries generally occur on beaches. Preferred rookeries and haul-out areas are located in relatively remote areas where access by humans and mammalian predators is difficult; locations are specific and change little from year to year (Steller Sea Lion Recovery Team 1992).

When not on land Steller sea lions are generally seen inshore, less than 5 miles from the coast. Steller sea lion foraging patterns vary depending upon age, season, and reproductive status, as well as the distribution and availability of prey. Foraging patterns of females during the winter months vary considerably; individuals travel an average of 133 km and dive an average of 5.3 hours per day. The vast majority of feeding dives occur to a depth of 100 m. The diet of Washington's Steller sea lions is not well known; primary prey items may include cod, pollock, rockfishes, herring, and smelt (Gearin and Jeffries 1996). They appear to be largely opportunistic feeders.

During the past 30 years, Steller sea lion populations have suffered a dramatic decline. Numbers in the rookeries of central/southern California, the central Berring Sea, and in the core Alaskan ranges have all decreased substantially. A number of natural and anthropogenic factors have been hypothesized as contributing to these declines, but a primary cause has not been definitively identified. It is generally thought that a nutritional deficiency resulting from a lack of abundance or availability of suitable prey is involved (Steller Sea Lion Recovery Team 1992). Major shifts in the abundance of fish in the Berring Sea over the past several decades are well documented (WDFW 1993). The Alaska pollock and Atka mackerel fisheries have specifically been implicated in decreasing the availability of prey. A similar decline has not been documented in the region from southeast Alaska through Oregon, where Steller sea lion numbers appeared to have remained stable (Steller Sea Lion Recovery Team 1992).

On August 27, 1993, NMFS designated critical habitat for Steller sea lions. All rookeries within U.S. borders, major haulouts in Alaska, aquatic areas associated with these terrestrial habitats, and aquatic foraging habitats in waters off Alaska were designated at this time (58 FR 53138). No critical habitat occurs in Washington.

*Utilization of the Action Area*

Steller sea lions may be observed in Puget Sound year round, but they are most abundant during the fall and winter months (Jeffries et al. 2000). No breeding rookeries have been identified in Washington waters; however, in 1992 a single pup was born on Carroll Island (WDFW 1993).

The most frequented haul-out areas in Puget Sound are located north of Admiralty Inlet. However, the species is occasionally seen on navigation buoys in Puget Sound (Jeffries et al. 2000). Harbor seals and California sea lion regularly haul out on navigation buoys, floats, and log booms in northeast Commencement Bay (Jeffries et al. 2000).

*Effects of the Proposed Action*

Given the lack of rookery and major haul-out areas in southern Puget Sound, when in the action area Steller sea lions are likely on foraging expeditions. Construction activities will have no effect on breeding habitat or behavior, and are unlikely to affect the Steller sea lion prey base. Construction activities would occur in an area with substantial human activity on both the waterward and landward sides of the shoreline. Additional noise from the shore-side operation of heavy equipment may have an effect on foraging opportunities. No boat operations will be a part of construction activities. Short-term impacts of any sound disturbance related to construction activities would likely result in displacement of animals rather than injury. The potential for long-term or indirect impacts of the proposed project to Stellar sea lions is minimal. The proposed work will not increase vessel traffic in the area, and construction activities are not anticipated to degrade water quality.

*Effect Determination*
This project is **not likely to adversely affect** the Steller sea lion since the potential for significant sound disturbance or impacts to water quality and prey abundance are highly unlikely. The project will have **no effect** on designated critical habitat for this species.

### *5.5 Puget Sound/Strait of Georgia Coho Salmon*

In July 1995, NMFS determined that listing was not warranted for the Puget Sound/Strait of Georgia ESU coho salmon. However, the ESU is designated as a candidate for listing due to concerns over specific risk factors.

Coho salmon have one of the more predictable life histories of the Pacific salmon. After 1 or 2 years in ocean waters, adult coho return to Grays Harbor from mid- to late September through mid-December, enter their parent rivers in beginning in October, and begin to spawn in November (WDFW and Washington Treaty Tribes 1994). Coho larvae spend 2 to 3 weeks absorbing the yolk sac in the gravels of the redd before they emerge. Juvenile coho salmon then rear in freshwater for approximately 15 to 18 months prior to migrating downstream to the ocean. Newly emergent fry usually congregate in schools in pools of their natal stream. As juveniles grow they move into riffle habitat and aggressively defend their territory, resulting in the displacement of excess juveniles downstream to less favorable habitat (Wydoski and Whitney 1979). This aggressive behavior may be an important factor maintaining the numbers of juveniles within the carrying capacity of the stream, and distributing juveniles more widely downstream. As territories are established, individuals rear in selected areas of the stream and feed on drifting benthic organisms and terrestrial insects. Territories expand as juveniles grow. Feeding and growth slow considerably in the fall and winter, as food production and fish metabolisms slow. Coho seek off-channel sloughs and ponds in which to spend the winter.

Coho salmon within this ESU are abundant and, with some exceptions, run sizes and natural spawning escapements have been generally stable. However, artificial propagation of coho salmon appears to have had a substantial impact on native, natural coho salmon populations, to the point that it is difficult to identify self-sustaining, native stocks within this region (Weitkamp et al. 1995). In addition, continuing loss of habitat, extremely high harvest rates, and a severe recent decline in average size of spawners indicate that there are substantial risks to whatever native production remains. There is concern that if present trends continue, this ESU is likely to become endangered in the foreseeable future (Weitkamp et al. 1995).

*Utilization of the Action Area*
Coho salmon utilize almost all the accessible tributaries in the Puyallup River drainage and tributaries to Commencement Bay (WDFW and WWTIT 1992). Coho returning to these tributaries typically enter freshwater from mid-August to early November and spawn from mid-October through mid-January. WDFW prohibits work in Commencement Bay from March 15 through June 14 for the protection of outmigrating salmon (WAC 220-110-271). The NMFS marine in-water work closure period for chinook in marine waters (March 1 through July 1) is therefore thought to be protective of outmigrating juvenile coho.

*Effects of the Proposed Action*
Given their life-history similarities, the effects of the action on coho are the same as those described above for chinook.

*Effect Determination*
Effect determinations are not made for candidate species.

## 6. INTERRELATED AND INTERDEPENDENT EFFECTS

No interdependent or interrelated actions are associated with the proposed action. The pier and sediment remediation work planned for the site during 2004 (or later) would occur regardless of the upland work. Justification for the pier reconstruction and sediment remediation work is not tied to the upland redevelopment. The pier has independent utility (e.g. boat moorage) apart from the upland training buildings. Likewise, the Army Reserve would be legally responsible for sediment remediation even if they vacated the site entirely. Therefore, the two projects are not interdependent or interrelated and the effects of the pier/remediation are not addressed in this BE.

## 7. CUMULATIVE EFFECTS

Much of Commencement Bay was designated as a Superfund site in 1981. Toxic chemicals and heavy metals introduced into the bay from a number of industrial activities continue to have adverse effects on the aquatic environment including benthic organisms, fish, marine mammals, and marine birds. The U.S. Environmental Protection Agency (EPA) and the Washington State Department of Ecology have divided responsibilities for the cleanup effort. EPA oversees the cleanup of contaminated sediments in the bay, while Ecology oversees the cleanup and control of pollution sources surrounding the bay.

Ecology's cleanup efforts are ongoing within and around the bay, and there is a general improving habitat trend. Ecology estimates that about 90 percent of the upland sites that require cleanup have been remediated. Continued cleanup efforts in the bay may result in temporary stress to protected species, but long term effects of these efforts would be beneficial. EPA's cleanup of contaminated sediments in the bay will be subject to Section 7 consultations.

The Army Reserve knows of no other future State or private actions, not involving Federal activities, that are reasonably certain to occur within the action area.

## 8. CONCLUSIONS

Table 2. summarizes the effect determinations made for each of the species potentially occuring in the project vicinity.

**Table 2. Determination Summary Table**

| Species | Effect Determination | Critical Habitat Determination |
|---|---|---|
| Bald Eagle | Not likely to adversely affect | — |
| Bull Trout | Not likely to adversely affect | — |
| Chinook | Not likely to adversely affect | Not likely to adversely affect |
| Steller Sea Lion | Not likely to adversely affect | No effect |
| Humpback Whale | No effect | — |
| Leatherback Sea Turtle | No effect | No effect |

## 9. ESSENTIAL FISH HABITAT

The project area is designated as Essential Fish Habitat (EFH) for various life stages of 17 species of groundfish, 5 coastal pelagic species, and three species of Pacific salmon. Current Army Reserve operations at the Pier 23 property may adversely impact EFH through the incidental discharge of petroleum hydrocarbons in stormwater runoff. The proposed action will improve the quality of runoff from the site through the installation of a stormwater collection system and an oil/water separator. The construction of new buildings on the upland portion of the site will reduce the potential for accidental operational discharges of petrochemicals or other hazardous materials, as storage and maintenance areas will be moved from the pier to the new upland facilities. No direct adverse effects to EFH are expected to result from upland construction activities.

## 10. PREPARERS

The Seattle District, U.S. Army Corps of Engineers (Corps) is acting as the construction agent for the U.S. Army Reserve Command, 70$^{th}$ Regional Support Command. This document was prepared by Aimee Kinney (Corps) and J. Keany (EDAW, Inc.).

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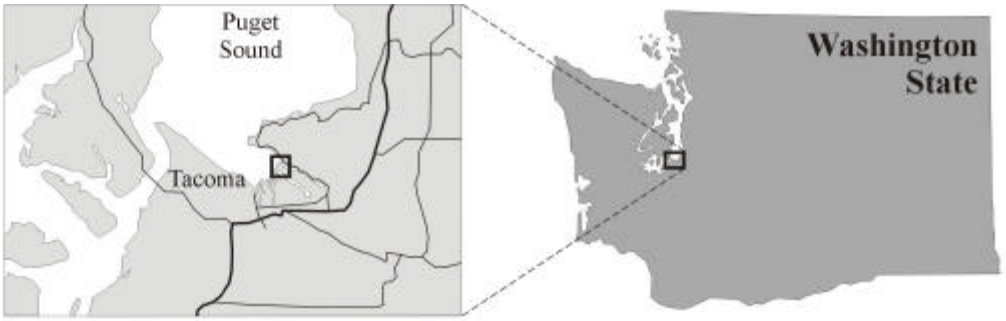
# Appendix A.
# Figures and Design Drawings

# APPENDIX A
# Figures and Design Drawings

## Figure 1. Region and Vicinity Map



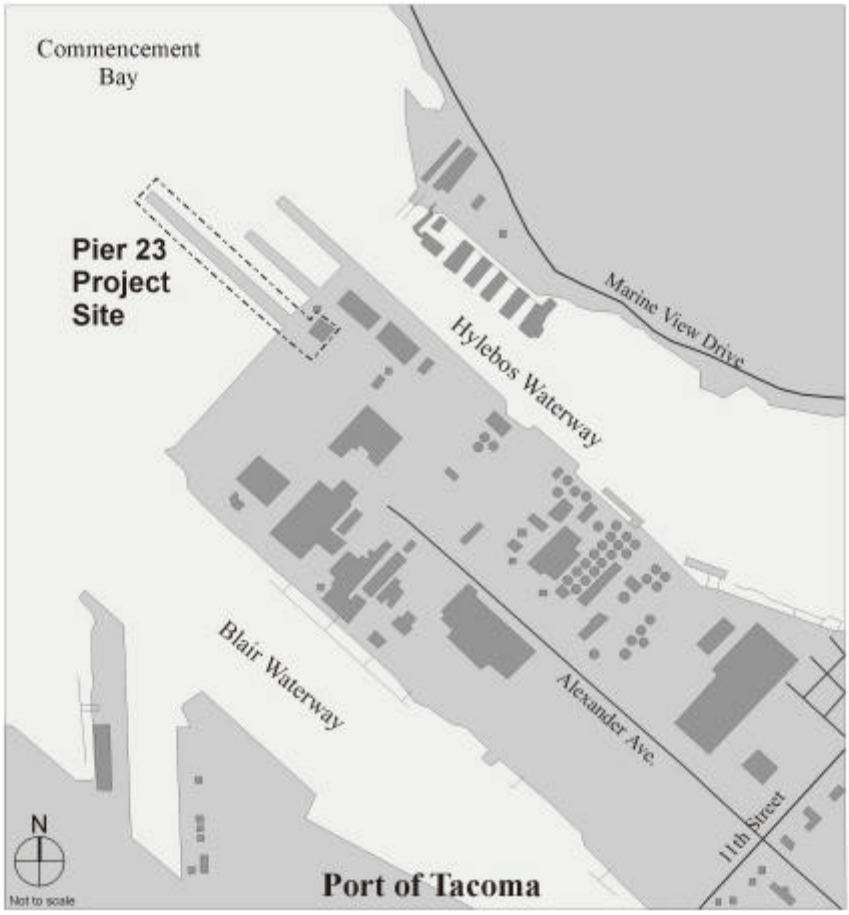
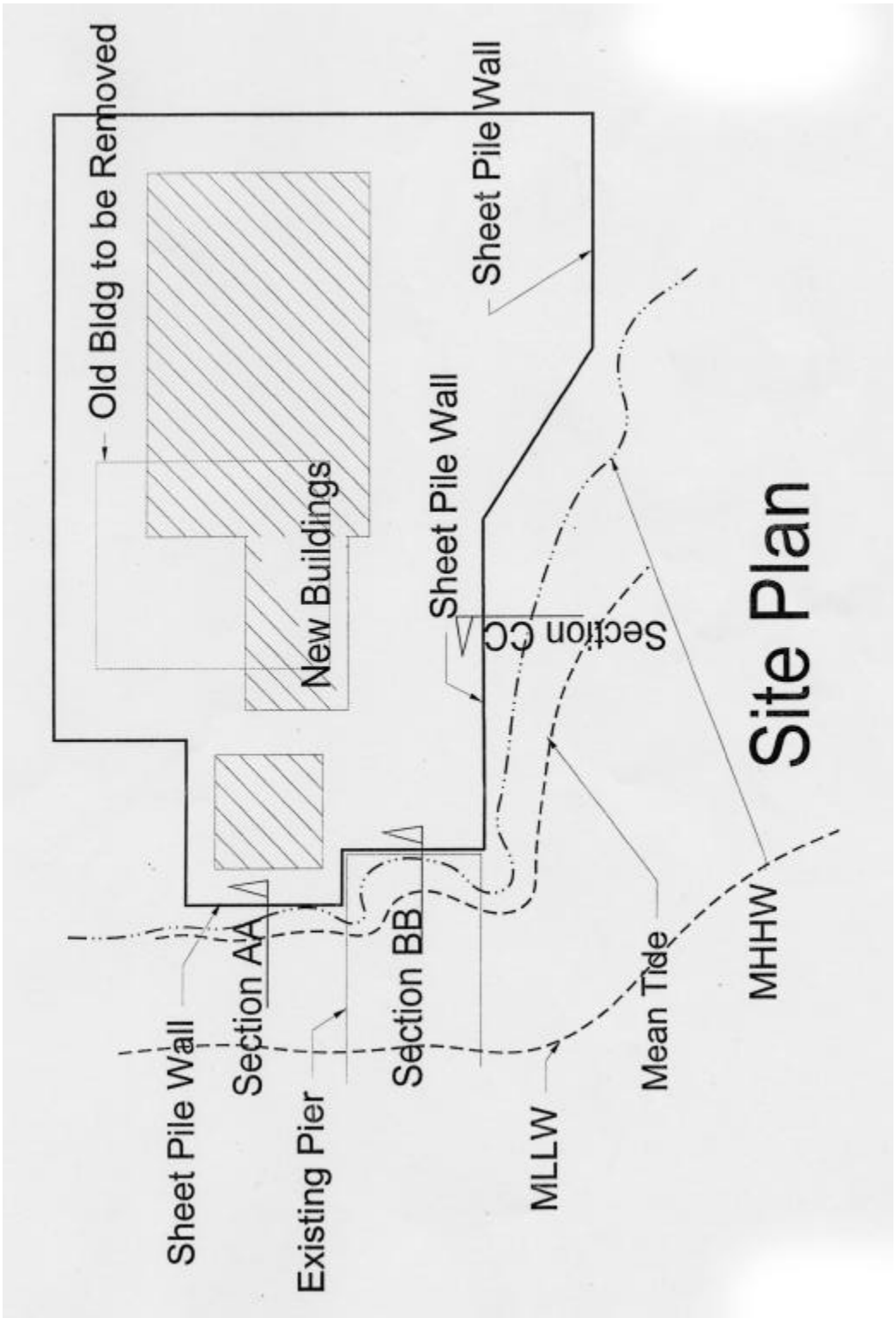



**Figure 2. Plan View**



## Figure 3. Shoreline Detail

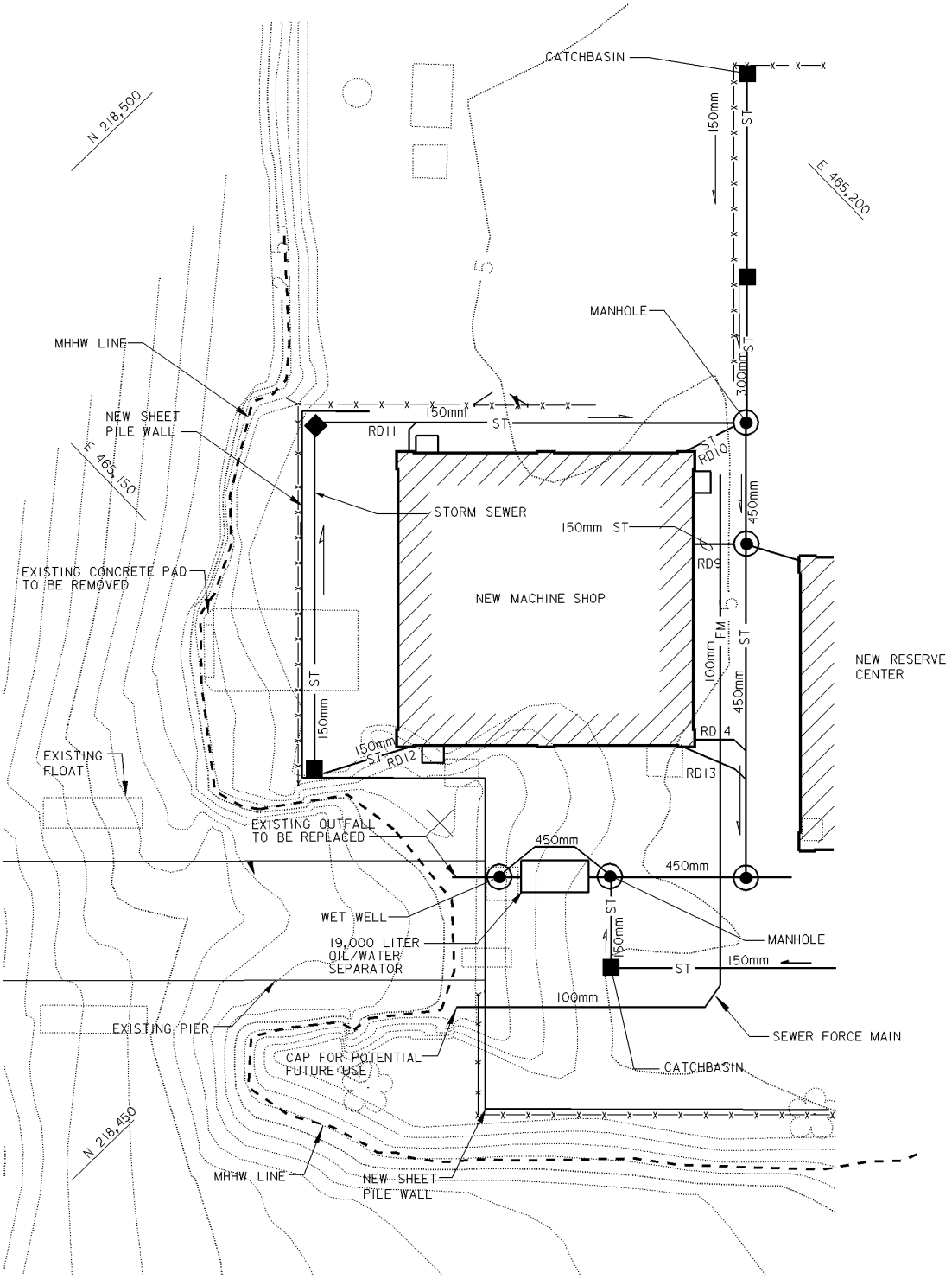


**Figure 4. Cross Section A-A**

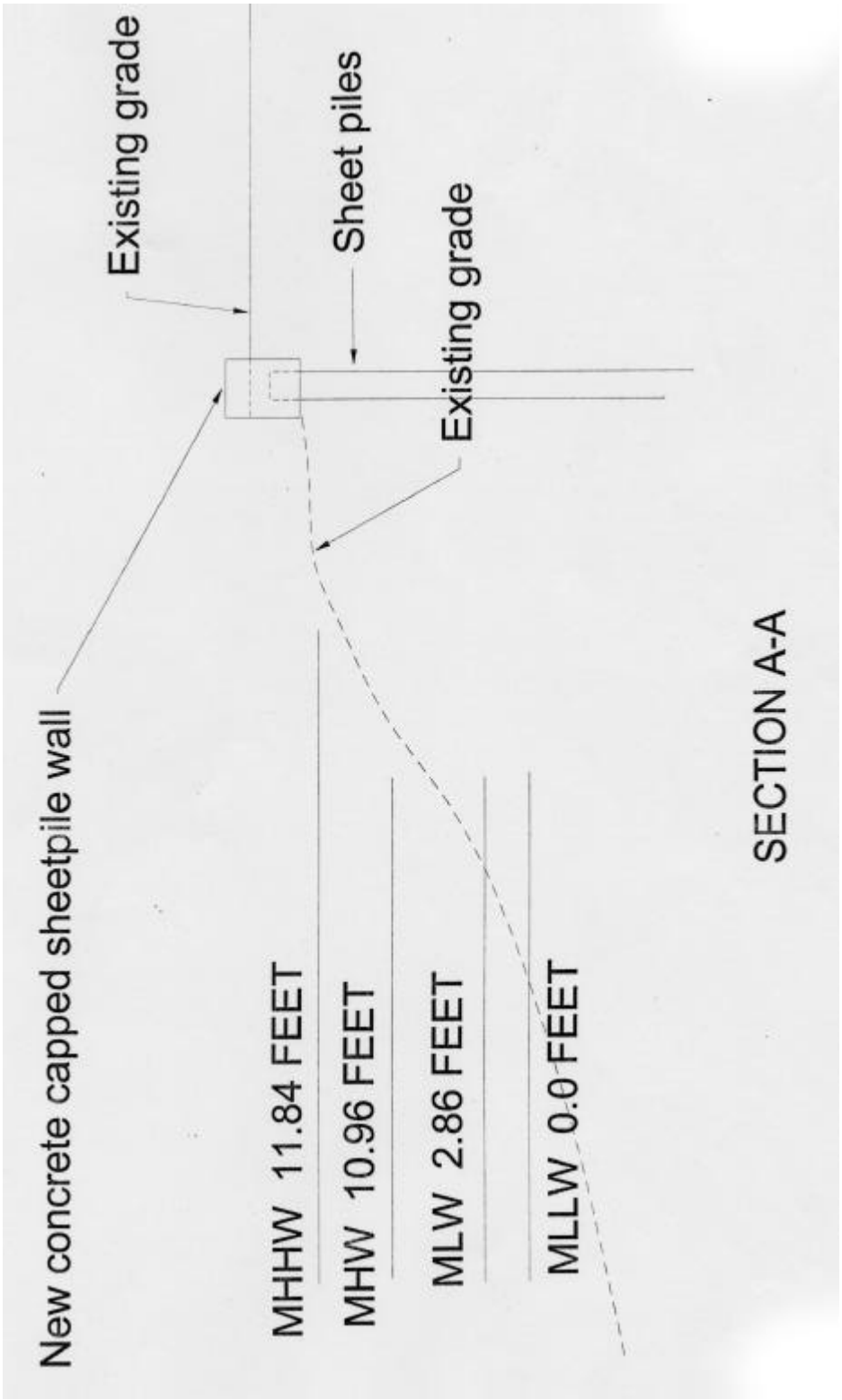


**Figure 5. Cross Section B-B**

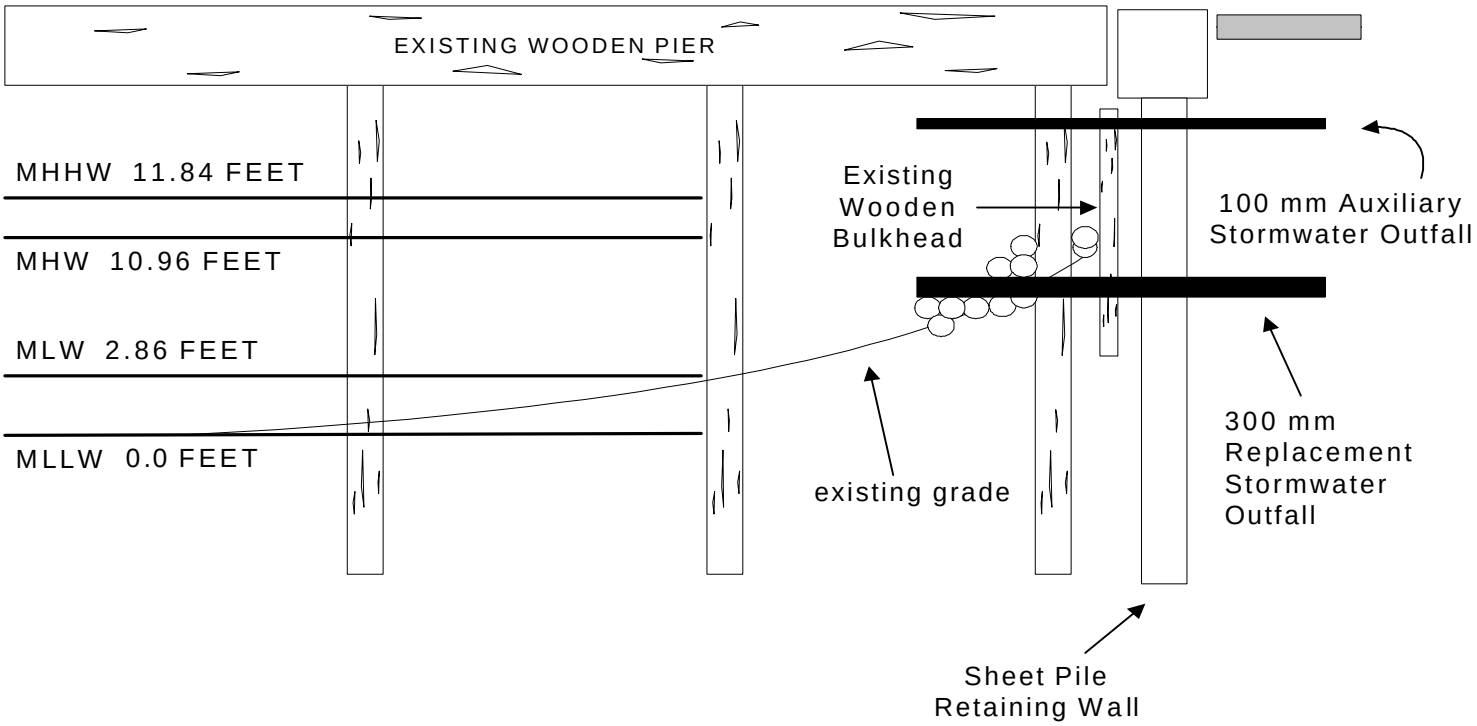


**Figure 6. Oil-Water Separator Detail**

**Figure 7. Sheet Pile Penetrations, Elevation View**

**Figure 8. Cross Section C-C**

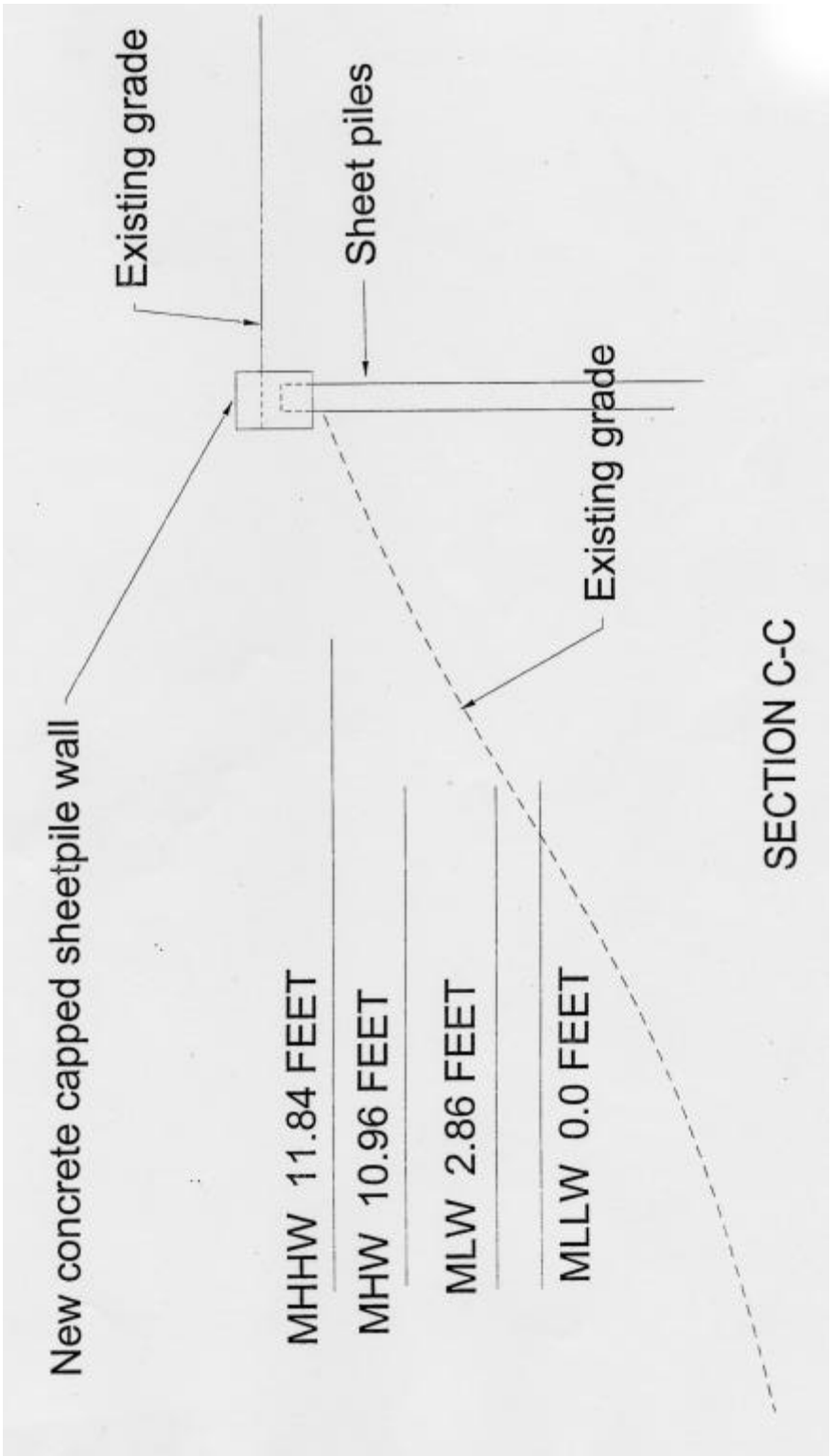


**Figure 9. Forage Fish Habitat in the Pier 23 Vicinity**

# Appendix B.
# Photographs of the Project Site

# APPENDIX B
# Photographs of the Project Site

**Photo 1** Building 580 and adjacent uplands, view towards the northwest (4-01).

**Photo 2** Building 580 and adjacent uplands, view towards the southeast (4-01).

**Photo 3** Concrete slab to be removed. Sheet pile alignment is behind fence.

**Photo 4** Concrete slab and sheet pile alignment, with Building 580 in the background (4-10).

**Photo 5** View of the western property boundary, facing southeast (4-01).
The sheet pile alignment will follow the fence. No vegetation will be removed.

**Photo 6** View towards Pier 23, facing the northwest, with Building 580 in the foreground (4-10).