Final Environmental Assessment

FY 2005-2009 MAINTENANCE DREDGING,

SNOHOMISH RIVER NAVIGATION CHANNEL, DOWNSTREAM AND UPSTREAM SETTLING BASINS,

EVERETT, WASHINGTON

September 20, 2004

US Army Corps of Engineers®
Seattle District

Final Environmental Assessment

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Executive Summary

Responsible Agency: The responsible agency for this project is the U.S. Army Corps of Engineers, Seattle District (Corps).

Summary: In accordance with the National Environmental Policy Act (NEPA), this document evaluates the potential environmental impacts of the dredging and disposal activities proposed by the Corps for fiscal years 2005 though 2009. This environmental assessment (EA) evaluates the potential impacts of the conducting maintenance dredging of the downstream and upstream settling basins and adjacent portions of the navigation channel within the lower Snohomish River in alternating years. Without annual maintenance dredging, shoaling would lead to a shallower navigation channel and would reduce the depth of the settling basins, thus reducing the ability of large ships to enter and leave the Port of Everett safely and increasing the need for harbor dredging. Other alternatives evaluated in this EA include dredging the channel and both settling basins every year, and dredging only the shoals in the navigation channel and not the settling basins.

This EA also evaluates the potential impacts of disposal of the dredged material at several possible sites, including beneficial use as capping material for the offshore Marine Sediments Unit (MSU) within the Pacific Sound Resources (PSR) Superfund Site in Elliott Bay, beneficial use of the sediments at the Port of Everett Riverside Business Park site, and disposal at the Washington Department of Natural Resources (WDNR) managed Puget Sound Dredged Disposal Analysis (PSSDA) open-water, non-dispersive disposal site at Port Gardner. During fiscal years 2006 through 2009, it is also possible that the dredged sediments may be used beneficially for renourishment of Jetty Island in Port Gardner or as clean fill at several previously used upland sites along the lower Snohomish River, including, but not limited to, the Langus Riverfront Park Rehandling site, the Kimberly Clark Log Yard site, and the Baywood site. If the Corps pursues these options during the fiscal years 2006 through 2009 time period, they would be evaluated in detail in an addendum to this EA.

Impacts from the dredging and disposal activities will generally be highly localized in nature, short in duration, and minor in scope. While there will be a loss of subtidal habitats for benthic invertebrates and demersal fish species, this loss is expected to be

temporary as these areas continuously reshoal and benthic populations are expected to recolonize the dredged areas quickly. There will be no loss of intertidal mudflat or marsh habitats. Impacts from this navigation project should not be significant, either individually or cumulatively. Beneficial use of the dredged sediments will have positive effects by capping contaminated sediments (at the MSU site), providing clean fill for redevelopment of formerly contaminated industrial sites (Riverside Business Park), and by renourishing eroding upland areas (Jetty Island).

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1.0 INTRODUCTION

In accordance with the National Environmental Policy Act (NEPA), this document evaluates the potential environmental impacts of the dredging and disposal activities proposed by the Corps for fiscal years 2005 though 2009 (October 1, 2004 through September 30, 2009). This environmental assessment (EA) evaluates the potential impacts of the proposed maintenance dredging of the downstream and upstream settling basins and adjacent portions of the navigation channel within the lower Snohomish River. Without annual maintenance dredging, shoaling would lead to a shallower navigation channel and would reduce the depth of the settling basins, thus reducing the ability of large ships to enter and leave the Port of Everett safely and increasing the need for harbor dredging.

This EA also evaluates the potential impacts of disposal of the dredged material at several possible sites, including beneficial use of the sediments at the Port of Everett Riverside Business Park site along the lower Snohomish River (Figure 1) and beneficial use as capping material as part of the U.S. Environmental Protection Agency's (EPA) planned remedial actions for the offshore Marine Sediments Unit (MSU) within the Pacific Sound Resources (PSR) Superfund Site in Elliott Bay (Figure 3). If the sediment were unacceptable for use as capping material or for beneficial use (based on sediment analysis results), or if more dredged sediment is available than can be used beneficially, sediment would be disposed of at the Washington Department of Natural Resources (WDNR) managed Puget Sound Dredged Disposal Analysis (PSSDA) open-water, non-dispersive disposal site at Port Gardner (Figure 2). PSSDA disposal is dependent on sediment analysis results indicating sediment suitability for open water disposal.

During fiscal years 2006 through 2009, it is also possible that dredged sediments may also be used beneficially for renourishment of Jetty Island in Port Gardner or as clean fill at several previously used upland sites along the lower Snohomish River, including, but not limited to, the Langus Riverfront Park Rehandling site, the Kimberly Clark Log Yard site, and the Baywood site. These sites have historically served as beneficial-use sites and their future use is dependent upon the need for materials at these sites, the availability of suitable material within the settling basin, and the availability of permits. If the Corps pursues these options during the fiscal years 2006 through 2009 time period, they would be evaluated in detail in an addendum to this EA.

1.1 PROJECT LOCATION AND DESCRIPTION OF ACTION AREA

The lower Snohomish River is the lower part of the Snohomish River system to which the Pilchuck, Skykomish, and Snoqualmie Rivers are the largest tributaries. The proposed dredging project encompasses the lower 6.5 miles of the river channel and includes the downstream settling basin, the upstream settling basin and the adjacent portions of the navigation channel, as well as several upland sites along the shoreline of

the lower Snohomish River, as contained within Township 29 North, Range 5 East, all sections (Figure 1).

The downstream settling basin (sometimes referred to as a turning basin) was developed by the Corps to catch sediment and reduce the frequency of dredging required to maintain safe navigation in the lower Snohomish River. The basin is approximately 700 feet wide, 1,200 feet long, and 20 feet deep; the channel to the south narrows to a width of approximately 425 feet, then narrowing further to ultimately meet the 150-foot wide navigation channel at a depth of 15 feet (Figure 1). The navigation channel extends upstream from the downstream settling basin for a distance of approximately 5.3 miles at a depth of 8 feet and a width of 150 feet. The upstream settling basin is approximately 150 feet wide, 2,112 feet long, and is usually dredged to a depth of 30 feet deep (although its authorized depth is 40 feet deep). The navigation channel extends upstream from the upstream settling basin for another approximately 0.5 miles at a depth of 8 feet and a width of 150 feet (Figure 1).

1.2 PROJECT PURPOSE AND NEED

These proposed dredging activities in the upstream and downstream settling basins and their adjacent portions of the navigation channel are a component of the Everett Harbor and Snohomish River Federal Navigation Project, providing maintenance of the navigation channel and settling basins in the lower Snohomish River (Figure 1). The purpose of the proposed project is to maintain safe and reliable navigation within the lower Snohomish River by reducing the potential risks associated with shoaling in the navigation channel and settling basins. Without annual maintenance dredging, shoaling would lead to a shallower navigation channel and would reduce the depth of the settling basins, thus reducing the ability of large ships to enter and leave the Port of Everett safely and increasing the need for harbor dredging.

In order to remove sediments which have shoaled since the last round of maintenance dredging in this area, the Corps proposes to dredge the downstream and upstream settling basins, as well as portions of the adjacent navigation channel in fiscal year 2005. A condition survey conducted in the spring of calendar year 2004 is used to determine the approximate volume of material that needs to be dredged in fiscal year 2005. The Corps proposes to then dredge the downstream and upstream basins again in alternating years as conditions warrant through fiscal year 2009. Dredging and disposal activities would be repeated in the downstream basin in fiscal years 2006 and 2008 and in the upstream basin in fiscal years 2007 and 2009 under this EA.

Details from an annual condition survey would be used to determine the volume of material to be dredged from each location and the most appropriate disposal option would then be determined based on the amount and characteristics of the accumulated sediments. The Corps would use the dredged sediments beneficially at the PSR Superfund site (if needed) or at a permitted upland disposal site in need of sediment if one were available. If beneficial use of the dredged sediment were unavailable, the

sediment would be disposed of at a permitted open water disposal site (most likely the Port Gardner site).

All dredging and disposal activities will be performed between October 16 and February 14 of each fiscal year and will generally require approximately two to three weeks to complete. Disposal activities at the PSSDA open water site and the PSR Superfund site will be conducted in accordance with established criteria for these sites, as detailed in their respective Biological Assessments and concurrence letters (USACE 2000a and 2000b, USFWS 2000, NMFS 2000, NMFS 2003a, USACE and EPA 2002, USFWS 2003a, NMFS 2003b).

1.3 ALTERNATIVE DISPOSAL SITES

1.3.1 PSR Superfund Site

The PSR Superfund site lies within Elliott Bay, near the south end of the Puget Sound Basin and directly offshore of the City of Seattle. The Marine Sediments Unit (MSU) is located approximately 0.3 miles west of the mouth of the Duwamish River's West Waterway and is composed of five Remediation Areas (RAs). Dredged material from the proposed action would likely be used to cap RA5a and then RA5b within the MSU. The specific location and extent of areas RA5a and RA5b are illustrated in Figure 3.

1.3.2 Port of Everett Riverside Business Park Site

The Port of Everett Riverside Business Park site is located downstream from the upstream settling basin, just south of the State Route 529 bridge along the left bank of the Snohomish River, and east of East Marine View Drive (Figure 1). The entire Riverside Business Park site encompasses approximately 78 acres and is predominately undeveloped land, formerly part of a Weyerhaeuser log mill. The portion of the site designated to receive the dredged sediments, the dredged material site or 'cell', encompasses approximately 8 acres of the property and is located on its southern end (Figure 4).

1.3.3 Port Gardner Bay PSSDA Site

The Port Gardner Bay PSSDA open water disposal site is located 2 nautical miles west of the Everett Harbor at 47 degrees 58.86 minutes North latitude and 122 degrees 16.67 minutes West longitude (NAD27)(Figure 2). The 318-acre site is circular with an overall diameter of 4,000 feet. The depth of this site is 420 feet. The site is relatively flat, with slopes of less than 1 foot vertical over a horizontal distance of 200 feet.

1.3.4 Jetty Island

Jetty Island is located approximately a quarter-mile west of the downstream settling basin (Figure 1). Creation of the Jetty Island began in 1903 with construction of a rock jetty behind which dredged materials from the navigation channel could be placed. The Corps and the Port of Everett placed approximately 323,000 cubic yards of clean sediment

along the western portion of Jetty Island from October through December 1989 to create a 1,500-foot long berm to balance erosion losses from the west side of the island and to create protected intertidal marsh and mudflat habitat. Once this 15-acre berm was created, a 19-acre mudflat formed within the protected embayment (Pentec Environmental 2000). A natural sand spit and an area of saltmarsh also subsequently formed off the northern tip and eastern side of the berm. However, since there is no natural source of sediment to nourish the berm, the life of the berm and the habitat it protects is limited without periodic replacement of eroded material with new sediment. Continuing renourishment of the berm is necessary to prevent the gradual erosion of the berm and to maintain the intertidal habitats created by the berm. Due to its sandy grain size, sediment from the channel just upstream of the downstream settling basin has been beneficially used to provide sediment renourishment to the berm on Jetty Island and is the most likely dredging area to provide sediment for subsequent renourishment efforts.

1.3.5 Other Potential Upland Disposal Sites

Sediment dredged from the settling basins and channel could ultimately also be used, if needed and appropriately permitted, at several previously utilized upland sites along the lower Snohomish River downstream from the upstream settling basin. These sites include, but are not limited to, the Langus Riverfront Park Rehandling site (formerly known as the City site), the Kimberly Clark Log Yard (formerly the Scott Paper Disposal Area), and the Baywood site (Figure 1).

1.4 AUTHORITY

Part one of this dredging project, adopted June 25, 1910 and modified by subsequent acts, consists of navigation channels, two settling basins, and dikes to serve navigation in Everett Harbor and Snohomish River. The overall navigation project includes:

(1) a one-mile channel from Puget Sound up the Snohomish River, 15 feet deep at mean lower low water (MLLW) and 150 to 425 feet wide.

(2) an upper channel extending to river mile 6.3, 8 feet deep at MLLW and 150 feet wide.

(3) two settling basins in the river channel;

a. the downstream basin with 250,000 cubic yards (cy) capacity (the capacity was 200,000 cy prior to the 1954 authorization to deepen the basin to –20 feet)

b. the upstream basin with one million cy capacity.

Part two consists of the dredged material to develop Jetty Island. The Jetty Island berm project was planned, designed, and coordinated by the Port of Everett (Port) and the Corps to demonstrate beneficial use of clean dredged material for habitat development.

1.5 PROJECT HISTORY

Dredging of the mouth of the estuary and construction of Jetty Island by the Corps began in the late 1800's and early 1900's to facilitate the commercial navigation, timber related industries, and the industrial development that characterizes the lower river today. The consequence on the environment of these actions has been moderate degradation of the lower Snohomish River and estuary through a combination of levees, channelization, and the destruction of the intertidal habitats in the estuary, including the loss of approximately 50 percent of the area of intertidal mudflat (Pentec Environmental 1992).

Construction of the navigational channel in Everett Harbor from 1894 to 1903 resulted in large volumes of sediment requiring disposal. Creation of the Jetty Island began in 1903 with construction of a rock jetty behind which these dredged materials could be placed. Maintenance of the channel and placement of the dredged material to build the island continued until 1969 (Houghton 1995). In the 1980's the Corps realized an opportunity to increase the size of the habitat on Jetty Island by continuing to use material from the lower settling basin and navigation channel. Today this island is approximately 3 km. Long and covers approximately 40 hectares, above mean higher high water (MHHW). A detailed description of the development of Jetty Island is described in Section 4.1.3 below.

1.5 ASSOCIATED STUDIES AND REPORTS

Documents that provided information regarding the lower Snohomish River, its fish and wildlife populations, past dredging and disposal activities, and the nature and impacts of disposal at the alternate disposal sites are referenced in Section 12.

2.0 DREDGING ALTERNATIVES CONSIDERED

Several alternative dredging actions were considered before the preferred alternative was selected. These alternatives included:

- the No Action Alternative,
- the Dredge Channel and Both Settling Basins Every Year Alternative,
- the Dredge Only Shoals in the Navigation Channel Alternative, and
- the Dredge Navigation Channel and Settling Basins in Alternate Years Alternative (the Preferred Alternative)

In order for any alternative to be acceptable, it must meet the following objectives. The alternative must meet the project purpose of maintaining a safe and reliable navigation within the lower Snohomish River by reducing the potential risks associated with shoaling in the navigation channel and settling basins, it should be environmentally acceptable, and it should minimize costs for both the sponsor and the Federal government.

2.1 NO ACTION ALTERNATIVE

Under the No Action Alternative, the Corps would not dredge the lower Snohomish River navigation channel, or the upstream or downstream settling basins for the next five years. The settling basins would remain full and any additional material would shoal in these areas and also move further down stream and shoal within the navigation channel. The increased shoaling would reduce the ability of vessels to use the navigation channel, particularly the ability of barges to enter and leave safely under full load. Eventually the situation could warrant emergency action by the Corps or the Port of Everett. This alternative would result in impacts to the Everett economy, as local companies would be forced to limit the quantities of materials shipped out of the Port, ship only during higher tides, or use different ports and pay additional cost for shipping material between Everett and these ports. Any of these options would have economic impacts on the local and regional economies.

At some point in the future, the upstream and downstream basins and the navigation channel would ultimately have to be dredged if navigation within the lower Snohomish River is to be maintained. Delayed dredging would result in the ultimate need to remove and dispose of a greater volume of shoaled sediments, and would take a longer period of time to conduct the dredging and disposal operations. The No Action Alternative would not maintain the federal navigation channel and settling basins in the lower Snohomish River and thus fails to meet the project purpose.

2.2 DREDGE CHANNEL AND BOTH SETTLING BASINS EVERY YEAR

Under this alternative, the Corps would perform dredging and disposal operations within the navigation channel and within both settling basins every year over the five-year time period of fiscal years 2005 through 2009. The dredging and disposal activities would be performed yearly between October 16 and February 14 of each fiscal year (or during other windows as may be determined by USFWS or NOAA Fisheries in the future). Under this alternative, yearly dredging would likely remove a smaller volume of material from the channel and within each settling basin during each round of dredging than under the Preferred Alternative.

The frequency of dredging under this alternative would be greater than that required by the project purpose to maintain a safe and reliable navigation channel; thus this alternative would result in increased costs due to the increased frequency of mobilization and dredging. This alternative would also be expected to have greater environmental effects because yearly dredging would not allow the benthic invertebrate and bottom-dwelling fish populations an opportunity to recover during non-dredging years. Thus, this alternative was not considered further because it was not considered to be the least environmentally damaging or cost-effective alternative.

2.3 DREDGE ONLY SHOALS IN NAVIGATION CHANNEL

Under this alternative, the Corps would perform maintenance dredging and disposal operations only within the navigation channel, not within either of the settling basins. Dredging of the channel would be performed yearly between October 16 and February 14 (or during other windows as may be determined by USFWS or NOAA Fisheries in the future). Under this alternative, the entire length of the navigation channel would be dredged to remove shoals and the settling basins would continue to fill with sediments transported downstream by the river. Once the settling basins were completely filled, shoaling would be expected to increase within the navigation channel.

This alternative would increase the scope of the project to encompass the entire navigation channel; this alternative would likely result in increased costs and greater environmental effects due to the increased size of the action area. This alternative also failed to meet the project purpose because it would not maintain the settling basins and would ultimately result in increased shoaling within the navigation channel. Thus, this alternative was not considered further because it did not meet the project purpose and was not considered to be the least environmentally damaging or cost-effective alternative.

2.4 DREDGE NAVIGATION CHANNEL AND SETTLING BASINS IN ALTERNATE YEARS (PREFERRED ALTERNATIVE)

Under this alternative, the Corps would perform dredging and disposal operations over the five-year time period, extending between fiscal years 2005 and 2009 in order to remove shoaled sediments from the navigation channel and settling basins. Dredging activities would alternate between the downstream and upstream basins (and their associated portions of the navigation channel) every other year after 2005 for the duration of this project (i.e. the downstream basin in 2006 and 2008; the upstream basin in 2007 and 2009). Both the downstream and upstream settling basins as well as the adjacent upstream portions of the navigation channel would be dredged in fiscal year 2005 because the annual dredging of the downstream basin was deferred from 2004. The dredging and disposal activities would be performed only between October 16 and February 14 of each fiscal year (or during other windows as may be determined by USFWS or NOAA Fisheries in the future) and would generally be accomplished within three to four weeks.

This alternative was preferred as the proposed action (preferred alternative) because it was the least environmentally damaging alternative that meets the basic project purpose of maintaining safe and reliable navigation in the lower Snohomish River. The proposed action would remove shoaled sediments over an appropriately sized project area to meet the project purpose, and does so at a frequency that is commensurate with the rate of shoaling within the river. While not inherent to the project purpose, this alternative also reduces impacts to other aquatic ecosystems through the use of the dredged sediments as clean capping material for contaminated sediments in Elliott Bay (Seattle Washington) and by using the dredged sediments to renourish Jetty Island and thus maintain juvenile fisheries habitat in Port Gardner Bay (Everett Washington) (as described below in Section 3.2).

3.0 DESCRIPTION OF PREFERRED ALTERNATIVE

3.1 DREDGING

The proposed action includes dredging and disposal operations to be performed over a five year time period, extending between fiscal years 2005 and 2009. Both the downstream and upstream settling basins and adjacent upstream portions of the navigation channel would be dredged in fiscal year 2005. Dredging activities would then alternate between the downstream and upstream basins (and their associated portions of the navigation channel) every other year thereafter for the duration of this proposal (i.e. the downstream basin in 2006 and 2008; the upstream basin in 2007 and 2009). The dredging and disposal activities will be performed only between October 16 and February 14 of each fiscal year (or during other windows as may be determined by USFWS or NOAA Fisheries in the future) and will generally be accomplished within approximately three to four weeks. Dredging is performed within this window in order to minimize disturbance to migrating and juvenile salmonids.

Details regarding the anticipated volumes of dredged materials, the types of equipment used, and the proposed use or disposal of the dredged sediment are determined based on annual condition surveys conducted in the spring prior to the proposed dredging. Therefore, approximately volume information and details regarding the types of dredging equipment and disposal options is specifically available only for the proposed 2005 operations. However, the Corps anticipates that the subsequent dredging of the downstream and upstream basins in 2006 through 2009 would be conducted in a substantially similar manner as that described below for the fiscal year 2005 dredging.

3.1.1 Dredging of Downstream Settling Basin and Adjacent Channel in FY 2005

The downstream settling basin would be dredged in FY 2005 (between 16 October 2004 and 14 February 2005) using clamshell equipment and then loading the dredged materials onto a bottom-dump barge. Clamshell dredges have a hinged bucket of steel with a 'clamshell' shape that is suspended from a crane mounted on a barge. During the dredging operation, an anchoring system of wire and anchors or spuds with or without tugs is used to control the position of the barge. The bucket is lowered to the sediment surface with the jaws open. When the force of the bucket weight hits the bottom, the bucket grabs a section of the sediments. As it is hoisted up through the water column, the jaws close carrying sediments to the surface. The sediments are then placed on a bottom-dump barge for transport to the disposal site (see Section 3.2 below for details of disposal options for sediment from the downstream settling basin). The bottom-dump barge contains the sediment within one large or several smaller compartments and deposits the sediments through doors on the bottom of the barge that open to release the sediments.

The downstream settling basin would be dredged between stations 333+50 to 345+50 to a required depth of -20 feet MLLW with an allowable over-depth of two feet below the

required dredge depth (i.e. to –22 feet MLLW). The downstream basin then narrows to meet the channel and would be dredged between stations 345+50 and 365+00 (Figure 1). The required dredge elevation within the channel downstream of station 363+50 (as the basin narrows downstream) is –15 feet MLLW, with an allowable over-depth of two feet below the required dredge depth (i.e. to –17 feet MLLW). The Corps would also dredge the portion of the navigation channel just upstream of the downstream settling basin in FY 2005 (between 16 October 2004 and 14 February 2005) by clamshell dredge. The portion of the channel just upstream of the downstream settling basin would be dredged between stations 304+00 to 333+50 to a required depth of –8 feet MLLW with the same allowable over-depth of two feet (i.e. to –10 feet MLLW) (Figure 1). Side slopes along the edge of the dredged portion of the channel would be approximately 1:2 slopes (height:width) after dredging. The total estimated volume available from the downstream settling basin and adjacent portion of the channel is approximately 260,000 cubic yards of sediment based on condition surveys conducted in spring of calendar year 2003.

The existing intertidal areas would not be impacted by the proposed dredging. The existing intertidal areas along the edges of the navigation channel would remain as existing habitat and would provide a movement corridor for fish and wildlife as the dredging operation proceeds through the basin and down the channel. The approximately 400-foot wide existing intertidal area would be retained along both banks of the navigation channel during and after dredging. This area extends between the outer edge of the dredged channel and Jetty Island to the west of the navigation channel and between the more developed shorelines of the Everett Marina, the 12th Street Channel, and the Everett Naval Station on to the east of the outer edge of the navigation channel. Similarly, the approximately 100 feet of existing intertidal area would be retained along the outer-most (western) edge of the widest portion of the downstream settling basin and the approximately 200 feet of existing intertidal area would be retained along the outer-most (western) edge of the narrowing portion of the downstream settling basin. Similarly, the approximately 200 feet of existing intertidal area would be retained along the entire eastern edge of the downstream settling basin. Because only developed shoals would be dredged within the settling basin, dredging may not be needed out to the outer edge of the settling basin based on the shoals indicated on the condition survey.

3.1.2 Dredging of the Upstream Settling Basin and Adjacent Channel in FY 2005

The upstream settling basin and a portion of the navigation channel just upstream of the upstream basin would also be dredged in FY 2005 (between 16 October 2004 and 14 February 2005). These areas would be dredged by hydraulic pipeline dredge that allows for direct placement of the dredged material onto uplands within an approximately one-mile radius of the dredging location. Dredged material would be beneficially used for redevelopment of the Riverside Business Park site by directly placing the sediment onto the site. Clamshell dredging would be used to remove any available sediment not needed at the Riverside site and place it on a bottom-dump barge for transport to the PSR Superfund or the PSSDA open water disposal sites.

The upstream settling basin would be dredged between stations 68+00 and 88+00 to an authorized depth of up to –40 feet MLLW, with an allowable over-depth of two feet below the required dredge depth (i.e. to –42 feet MLLW) (Figure 1). This area encompasses approximately 3,500 linear feet of channel (Figure 1). The portion of the channel just upstream of the upstream settling basin would also be dredged between stations 53+00 to 68+00 to a required depth of –8 feet MLLW, with an allowable over-depth of two feet below the required dredge depth (i.e. to –10 feet MLLW). Side slopes along the left bank edge of the dredged channel would be approximately 1:3 slopes (height:width) after dredging; side slopes along the right bank edge would be approximately 1:6 (height:width) after dredging. The total estimated volume available from the upstream settling basin and adjacent portion of the channel is approximately 200,000 cubic yards of sediment based on condition surveys conducted in spring of 2003.

The existing intertidal area with variable widths between 50 and 150 feet wide would be retained along both banks of the upstream settling basin and navigation channel in this area during and after dredging. This area extends between the outer edge of the dredged channel and the shoreline of the Kimberly Clark Log Yard property to the west and the shoreline of the Everett Sewage Treatment facilities to the east of the outer edge of the navigation channel and settling basin. Because only developed shoals would be dredged within the settling basin, dredging may not occur to the extreme outer edge of the basin based on the shoals indicated on the condition survey.

3.1.3 FY 2006 through 2009 Dredging

Because the volume of dredged sediment is determined based on annual condition surveys conducted prior to the dredging, it is not possible to exactly predict the volume of material that would need to be dredged during fiscal years 2006 through 2009. Shoaling rates and depths depend on river flows and sedimentation rates that are driven by seasonal rainfall. However, total volumes dredged between fiscal years 2005 and 2009 would not exceed the permitted maximum of 800,000 cubic yards from the upstream settling basin, 500,000 cubic yards from the downstream settling basin, and 200,000 cubic yards from the navigation channel, as presented in Public Notice CENWS-OD-TS-NS-22. Dredging conducted during the 2006 through 2009 time period would be conducted within the same time window and with the same conservation measures (as described in Section 3.3) as the fiscal year 2005 dredging described above.

Preferential disposal options would be beneficial use over open water disposal. Hydraulic dredging would be used if beneficial use sites on Jetty Island or at previously utilized upland sites such as the Langus Riverfront Park Rehandling site, the Kimberly Clark Log Yard, and the Baywood site (Figure 1) are available and the shoaled sediments are of appropriate size and quality. Hydraulic dredging would be used to directly place dredged sediments from either the upstream or downstream settling basins onto these beneficial use sites. If capping material for the PSR Superfund site were still needed, sediment would be dredged using clamshell equipment and the material transported to the PSR site by bottom-dump barge. Any sediment not usable at the upland sites or for capping the PRS Superfund site would likely be clamshell dredged and transported to the

PSSDA open water disposal site in Port Gardner Bay and disposed of by bottom-dump barge.

3.2 DISPOSAL

Disposal activities will be conducted in accordance with established criteria for either the PSSDA or the PSR Superfund sites. Effects of the disposal actions are analyzed in the Biological Assessment previously prepared by the Corps, and have been accepted by NOAA Fisheries and USFWS as described in their respective concurrence letters (USACE and EPA 2002,USACE 2000a and 2000b, USFWS 2000, USFWS 2003a, NMFS 2000, NMFS 2003a, NMFS 2003b).

In FY 2005, approximately 150,000 of the 200,000 cubic yards of sediment available from hydraulic dredging of the upstream settling basin and adjacent portion of the channel would be directly placed onto the Riverside Business Park site for beneficial use. Sediment not needed at the Riverside site would be dredged by clamshell and either used at the PSR Superfund site or disposed of at the PSSDA open water site. The majority of the sediment clamshell dredged from the downstream settling basin in FY 2005 would be used to cap the PSR Superfund site. If inappropriate for use as capping material or if the entire volume of available sediments (approximately 260,000 cubic yards) were not needed at the PSR Superfund site, the sediments would be disposed of at the PSSDA open water site.

In the FY 2006 through 2009 dredging period, sediments from the downstream settling basin and adjacent portion of the channel would likely be either hydraulically dredged for direct placement onto Jetty Island (if needed and if appropriate material exists) or clamshell dredged and disposed of at the PSSDA open water site (if appropriate for open water disposal). Similarly, sediments from the upstream settling basin and adjacent portion of the channel would likely be hydraulically dredged for use at one of the previously identified upland sites or clamshell dredged and disposed of at the PSSDA open water site.

3.2.1 PSSDA Open Water Disposal

Any sediments dredged from either the downstream or upstream settling basins or channel that are not beneficially usable at the upland sites or for capping the PSR Superfund site would be transported to the PSSDA open water disposal site in Port Gardner Bay and disposed of by bottom-dump barge.

The Corps Dredged Material Management Office samples sediments from within proposed dredging areas according to the PSSDA protocols prior to the annual opening of the dredging window; these samples are subsequently tested to determine whether the sediment meets the standards for disposal at the PSSDA site, as well as the Washington State Department of Ecology's Sediment Management Standards (SMS) and Atterberg

Limits for potential use as capping material for the PSR Superfund site (see Section 3.2.2).

Both the downstream and upstream settling basins and adjacent portions of the navigation channel are considered 'low-moderate' ranked areas for contaminates. When the downstream material was previously tested in accordance with the Dredged Material Management Office's PSSDA protocols in September 1996, the Dredged Material Management Plan Agencies concluded that the material was suitable for placement at the Port Gardner Bay PSSDA open water disposal site.

PSSDA protocol sediment suitability testing for the proposed FY 2005 dredging determined on January 28, 2004 that sediments from the downstream settling basin and channel are appropriate for open water disposal at the Port Gardner PSSDA site; a suitability determination on sediments from the upstream basin is in process. Based on past experience in this area, the sediments are expected to be suitable for open water disposal at the PSSDA site. EPA is currently confirming that the sediments from the upstream and downstream basins are acceptable for use as capping material for the PSR Superfund site. The sediment characterizations collected in calendar year 2004 have a 'recency frequency' of seven years; contaminate testing will thus be required again in 2011 prior to dredging.

3.2.2 PSR Superfund Site and Marine Sediments Unit Cap

The Pacific Sound Resources Superfund site, and its Marine Sediment Unit is located approximately 0.3 miles west of the mouth of the Duwamish River's West Waterway within Elliott Bay (Figure 3). The site includes the area where the Wyckoff West Seattle Wood Treating facility existed, and contaminated the sediments in adjacent portions of Elliott Bay. The PSR site was listed on the Superfund National Priorities List in May 1994.

As described above in Section 3.2.1, the Dredged Material Management Office samples sediments from within the proposed dredging areas according to the PSSDA protocols; these samples are also tested to determine whether the sediment meets the state standards for use as capping material at the PSR Superfund site. EPA is currently confirming that the sediments available in FY 2005 from the upstream and downstream basins are acceptable for use as capping material for the PSR Superfund site.

If the sediment samples meet capping standards, dredged material from the downstream settling basin and a portion of the sediment from the upstream settling basin (and adjacent portions of the channel) would be dredged by clamshell and used as capping material for Remediation Areas 5a and 5b of the MSU within the PSR Superfund Site (Figures 2 and 3). It is currently anticipated that the MSU will need approximately 200,000 cubic yards of sediment to complete capping of RA5a and RA5b.

The marine sediment cap is designed to do the following:

- Reduce the chemical flux from contaminated sediments and groundwater, and chemically isolate these sources from the benthic organisms that would be expected to recolonize the cap;
- Physically isolate the contaminated sediments and provide a clean habitat for benthic organisms;
- Maintain stability under static loads and have an acceptable reliability under design seismic loads;
- Resist erosion, suspension and transport of cap materials and underlying contaminated sediments by waves, tidal and wind induced currents, and propeller wash.

Confinement of contaminated marine sediments is accomplished by placement of a sediment cap that covers approximately 58 acres, approximately 22 acres of which is associated with Remediation Area 5 – Deep Offshore Area, sub-areas RA5a and RA5b (Figure 3). These areas extend from approximately -140 to -240 feet MLLW and include slopes with approximately 4 percent to 15 percent grades. Placement of cap material in RA5 can be accomplished in the most cost-effective manner by instantaneous bottom-dump placement of dredged material originating from routine maintenance dredging projects in local rivers.

The cap design, including cap thickness and material specifications, was completed in accordance with the Guidance for In Situ Subaqueous Capping of Contaminated Sediments (EPA 905-B96-004). Capping material will be selected and placed in such a way as to provide appropriate habitat for the marine organisms natural to the area. The entire area that is capped will be designated a “no-anchor” zone, to prevent damage by commercial vessels using large “whale-tail”-type anchors. Dredging restrictions will be placed on any future work within the PSR-MSU site.

3.2.3 Riverside Business Park Site

Sediment hydraulically dredged from the upstream settling basin and adjacent portion of the channel in fiscal year 2005 would be directly placed onto the 8-acre southern portion of the Riverside Business park site (Photo 1). The sediments would subsequently be ‘rehandled’ (collected and moved by truck) by the Port of Everett for use at the Riverside site or at other regional sites in need of dredged sediment.

Approximately 150,000 cubic yards of upstream basin sediment would be placed on the Riverside site during the fiscal year 2005 dredging. Sediment would be transferred to the site through the hydraulic pipeline which extends from the upper settling basin along the left bank river channel and then up and over the existing salt marsh and riparian berm and onto the Riverside site (see Photos 2 through 5). During past sediment placements at the Riverside site in January 2002, the 22-inch diameter plastic pipeline was towed to the site during high tide. Extra flotation on the pipe at high tide allows the contractor to get the pipe near the landing where a strap around the pipe is attached to a cable that is pulled by a dozer (to snake the pipeline) into the disposal area. The pipeline is pulled up onto and over the intertidal marsh bench by the equipment parked on the upland berm.

Location and placement of the pipeline would be conducted in a manner similar to the previously permitted sediment placement at the Riverside site. Great care would be taken during placement of the pipeline to minimize impacts to existing intertidal salt marsh and riparian vegetation along the shoreline to the greatest extent feasible. The salt marsh plants will be in winter dormancy during the approximately three to four week time period when the pipeline will be resting on the marsh and the pipeline does not move once in place (Photo 4). Due to these factors, there are not expected to be any long-term impacts to the limited area of intertidal marsh affected by the temporary placement of the pipeline.

The dredged material 'cell' is separated from the riparian edge of the river by man-made berms of sand to contain the water/sediment slurry (Photo 3). The cell is completely devoid of vegetation and slopes gradually downward to the north to slowly move the water toward the return point as the sediment settles out. Once the sediment settles out of the water/sediment slurry, the water would be returned to the river through a system of metal weirs extending from the end of the dredged material cell through a previously disturbed portion of the riparian edge to the river channel (Photo 6).

Water quality monitoring of the return water by the Corps would ensure State water quality conditions are met within the appropriate mixing zone of 150 foot radius from point of water discharge. Within the mixing zone, dissolved oxygen cannot drop below 6.0 mg/liter.

3.2.4 Renourishment of Jetty Island Berm

If renourishment of the Jetty Island Berm is needed at some point between FY 2006 and 2009, the downstream settling basin and/or the portion of the navigation channel just upstream of that basin would be dredged by hydraulic pipeline dredge and the sediments placed directly onto the berm for sediment renourishment. A supplement to this EA would be prepared to evaluate the specific effects of beneficial placement on Jetty Island.

Sediment would likely be transferred to the site by laying the pipeline across the island to the berm, in a manner similar to previous sediment placements, including detailed consultation with USFWS, NOAA Fisheries, and WDFW regarding extent, elevation, timing, and methods of placement. As during previous placements, earth-moving construction equipment would be used to shape the top and slopes of the berm after the material is placed. Care would be taken during placement of the pipeline and operation of the construction equipment to minimize impacts to existing dune and saltmarsh vegetation on the Jetty Island berm to the greatest extent feasible.

3.2.5 Potential Beneficial Use at Other Upland Sites

If sediments are needed for the various upland disposal sites on the lower river (including but not limited to the Langus Riverfront Park Rehanding, Kimberly Clark Log Yard, or Baywood sites), between FY 2006 and 2009, the upstream settling basin and/or the

portion of the navigation channel just upstream of that basin could be dredged by hydraulic pipeline dredge and the sediments directly placed at one or more of these upland sites. Other as yet unidentified beneficial use sites in the vicinity could also be utilized if sediment were needed. The future use of any of these sites is dependent upon the need for materials, the availability of suitable material within the settling basin, and the availability of permits. The decision to hydraulically dredge and beneficially use the material would be based on a determination that a need exists for renourishment/upland placement and suitable material is available based on annual condition surveys within the navigation channel and settling basins. A supplement to this EA would be prepared to evaluate the specific effects of potential use of these upland sites.

Sediment would likely be transferred to the site by laying the pipeline to the site, in a manner similar to previous sediment placements, including detailed consultation with USFWS and NOAA Fisheries regarding extent, elevation, timing, and methods of placement. As during previous placements at these sites, care would be taken during placement of the pipeline and operation of the construction equipment to minimize impacts to existing intertidal and upland vegetation to the greatest extent feasible.

3.3 CONSERVATION MEASURES

Measures incorporated into the proposed action, including the dredging scheduling and Section 401 Water Quality Certification conditions, would reduce adverse environmental effects. The proposed dredging would be conducted between October 16 and February 14. Dredging would thus be avoided during peak juvenile salmon migration months between February 15 and July 15 (or as designated by NOAA Fisheries, USFWS, or WDFW). This would also avoid noise impacts to juvenile salmonids. Avoiding dredging during peak salmonid out-migration periods would also minimize the short-term effects of the proposed action on the variety of species that prey upon juvenile salmonids.

The principal water quality impact of dredging is the temporary increase in concentration of suspended solids in waters near the dredging site. The effects of dredging on water quality can occur during dredging, during transfer of the dredged material to the barge, or during decant water discharge or if the barge overflows. In FY 2005, the proposed dredging would be accomplished using both a clamshell dredge and a hydraulic pipeline dredge. Sediments may be resuspended into the water column through lowering of the clamshell bucket, impacting the bottom with the bucket, closing the bucket, raising the bucket through the water column, and depositing sediments onto the haul barge. Sediments would be also be resuspended into the water column by the cutterhead/water jets of the hydraulic dredge; the cutterhead is used to break up the sediment surface prior to suctioning through the large hose that allows for direct placement at the designated upland site.

These effects are temporary and localized to the immediate area surrounding the dredging. Due to the timing of the proposed dredging operation, they are limited in time to periods outside the migration period for juvenile salmonids and are limited in space to

the immediate vicinity of dredging activities. Temporary effects on water quality and on juvenile salmonids would also be minimized by measures (as detailed below):

(1) Clamshell dredging will be carried out in a manner that minimizes spillage of excess sediments from the clamshell bucket and minimizes entrainment of fish.

(2) Hydraulic dredging will be carried out in a manner that minimizes entrainment of fish and disturbance of the sediment surface outside of the immediate vicinity of the dredging operations. Impacts from the placement of dredged materials on the Riverside Business Park site, Jetty Island, or at any of the other upland sites would be minimized through directed discharge points and sampling of the return water for total suspended solids and dissolved oxygen.

(3) Barges used to transport the dredged material to the disposal or transfer sites will not be filled beyond their capacity to completely contain the dredged material in order to minimize spillage of dredged sediments over the side of the barge.

(4) Disposal operations and material effects will be in conformance with PSDDA management standards.

(5) Adherence to conditions included in the Section 401 Certification issued on September 17, 2004 by the Washington State Department of Ecology (WDOE) for this project (Appendix A).

4.0 EXISTING CONDITIONS

4.1 PHYSICAL CHARACTERISTICS

4.1.1 Snohomish River and Estuary

The Snohomish River basin has a varied topography, ranging from the western intertidal lands, to steep cliffs in the eastern foothills of the Cascade Mountains and draining some 1,978 square miles of land. Although forests cover approximately 82 percent of the basin, agricultural lands predominate throughout the coastal lowlands and extend inland along the alluvial river bottoms. The approximately 1,900 acres of the lower river basin was historically almost totally wetland (USACE 1991). Much of the historic intertidal and freshwater wetlands of the floodplain have been diked and drained for agriculture and flood control. Agricultural diking, wetland loss, and the reduction of large woody debris supply to the lower river are implicated in the decline of the basin's salmonid stocks. Logging and clearing for agricultural/residential development continue to impact the lower Snohomish River and estuary. Nearly all the upland area in the project vicinity is now used for industrial, commercial, residential, or agricultural purposes. In many instances, urban land use has been made possible by conversion of wetlands to uplands using dredged material as fill.

The Snohomish River is formed by the confluence of the Snoqualmie and Skykomish Rivers about 22 miles southeast of Everett, Washington. The river enters Puget Sound at Everett about 30 miles north past the City of Everett, then curves westward to enter Puget Sound via Port Gardner Bay (Figure 1). The river has an approximate mean annual flow of 9,951 cubic feet per second (as measured at Monroe in 1985). Most of the larger-size sediment particles have been deposited in the middle river, and the lower river has primarily a sand and mud substrate.

The lower Snohomish River estuary is approximately 9 miles long and three to four and a half miles broad at it's widest. It is an area of very low gradient with a sinuous, meandering main channel and three main distributary channels (Steamboat, Union, and Ebey Sloughs) spread over the broad delta floodplain (Figure 1). Lower reaches of the Snohomish River, as well as Ebey, Steamboat, and Union Sloughs, and their associated complex of wetlands are estuarine areas under saltwater influence. These sloughs create islands within the river delta which are generally undeveloped, publicly owned, and are managed for the benefit of fish and wildlife. The habitats along the Snohomish River and within it's estuary function as a wildlife corridor linking urban and rural open spaces from the foothills of the Cascade Mountains to the Puget Sound lowlands and adjacent waters.

4.1.2 PSR Superfund Site

The Marine Sediments Unit (MSU) within the PSR Superfund site encompasses approximately 66 acres of Elliott Bay (Figure 3). Bottom depths within the MSU range from intertidal to over 200 feet deep, with a steeply sloped configuration ranging from 6 to 20 (or greater) percent slope. Tidal elevations range from extreme low water at –4 feet mean lower low water (MLLW) to extreme high water at +14.8 MLLW. Remediation Areas 5a and 5b (which may be capped with the dredged material) extend from approximately –140 to –240 feet MLLW and include slopes with approximately 4 percent to 15 percent grades. Circulation within Elliott Bay is driven principally by tidal forces, modified somewhat by the effects of winds, salinity and temperature differentials.

4.1.3 Riverside Business Park Site

The Port of Everett Riverside Business Park site is located downstream from the upstream settling basin along the left bank of the Snohomish River (Figure 1). The far south end of the 78-acre site has been used for placement of dredged sediment destined for beneficial use on the Riverside or other comparable upland sites (Figure 4). The Riverside site was formerly the Weyerhaeuser Everett East lumber processing site; prior to purchase of this site by the Port of Everett, approximately 300,000 cubic yards of wood waste debris was removed from the site by Weyerhaeuser in an agreement with the Washington Department of Ecology to cleanup contaminates at the site. Since remediation of the site, the Port has been importing clean sediment to refill the site and to ultimately allow redevelopment of the site (as well as others in the vicinity). Material was last placed on the Riverside site by hydraulic pipeline dredge in January 2002; at that time, the upstream settling basin provided approximately 111,129 cubic yards of sediment to the Riverside site.

The Riverside site is a generally flat, undeveloped site, characterized on its northern end by low herbaceous vegetation (Photo 7). The dredged material ‘cell’ at the southern end of the site is completely devoid of vegetation, being composed of sands previously deposited on the site in past rounds of maintenance dredging (see Photo 1).

4.1.4 Port Gardner Bay PSSDA Site

The Port Gardner Bay PSSDA disposal zone is a 318-acre circular site with a diameter of 1,800 feet and a depth of 420 feet. The site is relatively flat, with slopes of less than one foot vertical over a horizontal distance of 200 feet. Currents are weak at this depositional site and move predominantly northward to westward. Pre-disposal sediment at the site was predominantly medium and fine silt with greater than 15% clay. Large polychaetes and bivalve mollusks dominate the benthic infauna at the Port Gardner site (USACE 2000a and 2000b).

4.1.5 Jetty Island

The Corps and the Port of Everett placed approximately 323,000 cubic yards of clean sediment as a 1,500-foot long berm along the western portion of Jetty Island from

October through December 1989 to balance erosion losses from the west side of the island and to create protected intertidal marsh and mudflat habitat. The berm was planted in the spring of 1990 and again in 1991 with native saltmarsh vegetation (above +9 feet MLLW). Subsequent natural colonization of salt-tolerant upland plant species has also occurred above +12 feet MLLW. Once this 15-acre berm was created, a 19-acre mudflat formed within the protected embayment (Pentec Environmental 2000). A natural sand spit and an area of saltmarsh also subsequently formed off the northern tip and eastern side of the berm. Monitoring by Pentec Environmental (Pentec) from 1990 through 1995 demonstrated that the berm created valuable mudflat habitat for benthic infauna and epibenthic crustaceans, which improved the food supply and habitat value of Jetty Island for juvenile salmon, forage fish, and shore birds.

However, since there is no natural source of sediment to nourish the berm, the life of the berm and the habitat it protects is limited without periodic replacement of eroded material with new sediment. The area of saltmarsh that had developed inside of the sand spit was largely obliterated in 1997 during overtopping storms that deposited over two feet of sand onto the marsh. In January 1998, the Corps placed an additional approximately 81,000 cubic yards of clean sediment from maintenance dredging on the berm (top of bank to the +5 to +6 foot contour) to partially address overtopping by storms (Pentec 2000). However, the quantity of material placed in 1998 was insufficient to replace all the material that had eroded, particularly along the northern half of the berm.

As of 1999, the berm had lost an estimated 98,000 cubic yards of sediment. Approximately 10 percent (or 10,000 cubic yards) of sediment was transported northward and deposited on the distal end of the berm. The rest of the sediment (approximately 80,000 cubic yards) was presumably carried offshore. Fortunately, the winter of 1999 to 2000 was unusually mild and little additional erosion was experienced along the berm during that time. By summer 2000, the berm showed a loss of material from its outer half and additional nourishment was planned to maintain the integrity of the berm and the habitat values that had developed within the sheltered lagoon it forms (Pentec 2003). Between January 14 and 18, 2002, approximately 30,000 cubic yards of material from the channel upstream of the downstream settling basin was hydraulically placed on Jetty Island for renourishment of the berm. Sediment was placed in a configuration that preserved the existing area of mudflat and saltmarsh habitat while widening and strengthening the berm, but not extending its length (Pentec 2003). Continuing renourishment of the berm will be necessary to prevent the gradual erosion of the berm and to maintain habitats created by the berm.

4.1.6 Other Potential Upland Disposal Sites

The other potential upland disposal sites (including, but not limited to the Langus Riverfront Park Rehandling site, the Kimberly Clark Log Yard, and the Baywood site, are all located along the lower Snohomish River and have beneficially used dredged sediments from the upstream settling basin and adjacent upstream portion of the navigation channel in the past. The future use of these sites is dependent upon the need

for materials at these sites, the availability of suitable material within the settling basin, and the availability of permits.

4.2 WATER AND SEDIMENT QUALITY

Much of the water quality data was gathered from the WDOE water quality-monitoring gauge located at river mile 12.7 of the Snohomish River as it flows through the town of Snohomish at the bridge over the river on Avenue D (gauge #07A090). The Snohomish gauge is the closest gauge to the settling basins on the river and is located approximately 6.4 miles above the upstream settling basin. We reviewed water quality sampling gauge data since 1976 and compiled data records for stream flow, dissolved oxygen, temperature, and turbidity from within the proposed period of dredging (between October 16 and February 14) for the period spanning October 1976 to January 2002.

4.2.1 Water Contamination

The Washington State Department of Ecology is responsible for setting water quality standards for surface waters of the State based on designated water uses and criteria. The waters of the lower Snohomish River from the southern tip of Ebey Island at river mile 8.1 to the mouth have an 'aquatic life use' designation of "salmon and trout spawning, non-core rearing and migration" (WAC 173-201A-600, 602). This area encompasses the navigation channel, and both upper and downstream settling basins. The marine waters of Everett Harbor are designated as "good quality for salmon migration and rearing" (WAC 173-201A-610, 612).

The only portions of the lower Snohomish River on the Department of Ecology's 303(d) list of threatened and impaired waters are within the vicinity of the Riverside Business Park site in Sections 8 and 16 (Township 29 North, Range 5 East) (Figure 1). Listed parameters in this area include a multitude of chemical contaminates and temperature. Pollutants within the Snohomish River are derived primarily from industrial point and non-point sources, storm water runoff from agricultural fields, and leakage of septic fields. The Cities of Everett, Marysville, and Lake Stevens discharge wastewater effluent into the estuary (Snohomish River Basin Salmonid Recovery Technical Committee 2002). The enforcement of total maximum daily load limitations for a number of parameters is expected to result in additional improvements in water quality.

4.2.2 Turbidity and River Flow

The highest sources of turbidity within the navigation channel and the settling basins are periodic pulses of sediment moving downstream within the Snohomish River from seasonal rainfall events and the natural mixing of fine-grained sediments suspended during the tidal cycle. Temporary pulses can also result from prop-wash within the marina and Everett Naval Station.

The water quality sampling gauge data (gauge # 07A090) indicates that the Snohomish River has variable suspended sediment levels within the proposed dredging period, reaching maximum levels in conjunction with maximum flows resulting from winter rainstorms. Average river flow within the time period of the proposed dredging (October 16 through February 14) has been 10,346 cubic feet per second (cfs), with maximum flows of 41,800 cfs, recorded on October 17, 1988. Suspended sediment levels generally reach their maximum between November and January, with pulses of high turbidity during February and early March storms (see below).

Average suspended sediment levels recorded during the window of the proposed dredging (October 1 through February 14) have been 7.4 NTU, including the highest readings of 51 NTU during the high flows of October 17, 1988 (see above), 31 NTU on November 28, 1977, and 27 NTU recorded on December 13, 1982. Lowest readings during the proposed dredging period have been 1 NTU, recorded five times during the month of October (1976, 1980, 1986, 1987, and 1992) and once in November (1976). Higher turbidity levels would be expected downstream of the monitoring station within the mixed waters of the estuary.

The Snohomish River is also characterized by sporadically high levels of suspended sediment occurring just after the end of the proposed dredging window (post February 14). Maximum suspended sediment levels recorded since 1976 include 100 NTU recorded on February 16, 1982, 90 NTU on February 20, 1995, and 86 NTU recorded on February 17, 1981.

4.2.3 Dissolved Oxygen

The water quality sampling gauge data (gauge # 07A090) indicates that the Snohomish River has generally high dissolved oxygen levels within the proposed dredging period, reaching maximum levels generally between mid-December and mid-February. Average dissolved oxygen levels recorded during the window of the proposed dredging (October 1 through February 14) have been 11.9 mg/L, including the highest readings of 13.5 mg/L on December 10, 1990, 13.3 mg/L on December 12, 2001, January 18, 1993, and January 23, 1984. Lowest readings during the proposed dredging period have been 9.6 mg/L, recorded on October 19, 1987. Dissolved oxygen levels between 9.0 and 10.0 mg/L have been recorded more commonly between July and September, corresponding with the lowest annual stream flows. The lowest recorded dissolved oxygen level (8.1 mg/L) was recorded on August 15, 1977.

4.2.4 Temperature

The water quality sampling gauge data (gauge # 07A090) indicates that the Snohomish River has fluctuating, but generally low water temperatures within the proposed dredging period. Average temperature recorded during the window of the proposed dredging (October 1 through February 14) was 6.4°C. The highest temperatures during the proposed dredging period have generally occurred in mid-October, with high temperatures of 14.1°C on October 6, 1980, 11.8°C on October 19, 1993, and 11.4°C on October 20, 1986. Lowest readings during the proposed dredging period have been

0.1°C, recorded on January 28, 1980. Temperatures greater than 17.5°C (lethal to developing fish embryos) have generally been recorded only during July –August. The highest recorded temperature (21.6°C) was recorded on August 15, 1977 (on the same date as the lowest recorded dissolved oxygen levels).

4.2.5 Sediment contamination

Sediments from the portions of the downstream settling basin and adjacent portions of the navigation channel to be dredged in FY 2005 were tested according to Puget Sound Dredged Disposal Analysis (PSDDA) protocol the week of September 22, 2003. Sediments from the upstream basin were tested in March 2004. This testing is used to determine where dredged sediments can be placed, including beneficial use of the dredged sediments on Jetty Island or the Riverside Business Park site, for capping the MSU, or disposal at the PSDDA open water site in Port Gardner Bay, as discussed herein. Despite industrial pollution within the lower Snohomish River, previous rounds of PSDDA protocol sampling have determined that sediments from the downstream and upstream settling basins and the navigation channel have been suitable for both beneficial use and PSSDA open water disposal.

On January 28, 2004, the results of this testing determined that sediments from the downstream settling basin and channel are again appropriate for open water disposal at the Port Gardner PSSDA site. On July 7, 2004, the results of this testing determined that the sediments from the upstream settling basin and channel are also appropriate for open water disposal at the Port Gardner PSSDA site.

There is a high degree of sediment contamination currently found within the PSR Superfund Site and the intertidal and subtidal habitats of the Marine Sediments Unit (MSU). This is the result of relatively recent anthropogenic sources, principally the Wyckoff West Seattle Wood-Treating Facility in operation from 1909 until 1994. Sediments in the PSR-MSU are contaminated with polycyclic aromatic hydrocarbons (PAH) and other hazardous substances; contaminant levels far exceed sediment quality standards. Current remediation efforts intended to minimize human and benthic community exposure to contaminants, as well as the potential effects of these efforts on Federally listed fish and wildlife species are detailed in the Biological Assessment previously prepared for the PSR Superfund Site and the MSU (USACE and EPA 2002).

EPA confirmed on April 27, 2004 that the sediments from the downstream basin were acceptable for use as capping material for the PSR Superfund site based on tests for the Washington State Department of Ecology's Sediment Management Standards (SMS) and Atterberg Limits. EPA in the process of confirming that sediments from the upstream basin are also suitable for use as capping material for the PSR Superfund site. The sediment characterizations collected in calendar year 2004 have a 'recency frequency' of five to seven years; contaminant testing will thus be required again in 2009 to 2011 prior to dredging.

4.3 VEGETATION

4.3.1 Subtidal and Intertidal Vegetation

A large eelgrass meadow exists off the west shore of Jetty Island. Pentec estimated that the area west of Jetty Island which could support eelgrass was approximately 1,284 acres in size, based on preliminary video mapping (Pentec 1996). A photographic and underwater video mapping effort conducted in 2000 (Pentec 2001) showed that the largest continuous eelgrass meadow lies just west of the south end of Jetty Island. Eelgrass to the west and north of this area consists of discontinuous patches that are divided by meandering distributary channels of the Snohomish River as it flows over its delta at low tide (Pentec 2003).

Intertidal marshes along the lower Snohomish River channel are dominated by typical native estuarine emergent species including: Lyngby's sedge (*Carex lyngbyei*), pickleweed (*Salicornia virginica*), fleshy jaumea (*Jaumea carnosa*), tufted hairgrass (*Deschampsia caespitosa*), hard-stem bulrush (*Scirpus acutus*), and Pacific silverweed (*Potentilla pacifica*) with generally forested and scrub-shrub riparian wetland and upland buffers. Spencer Island is located just upstream of the upstream settling basin at the confluence of Union and Steamboat Sloughs with the mainstem of the Snohomish River (Figure 1). Spencer Island supports larger areas of native intertidal vegetation, much of it within the recently restored southern section of the island. This portion of the island was diked for agricultural use, but has recently been breached to restore tidal connectivity and intertidal vegetation to the island.

Due to the degree of development along the shoreline of Port Gardner Bay, there are very few areas of native intertidal vegetation along the downstream settling basin or adjacent portions of the navigation channel. There are scattered small areas of intertidal salt marsh further upstream, within the vicinity of the upstream settling basin and edges of the navigation channel.

Scattered areas of intertidal salt marsh fringe the lower riverbanks around the Riverside Business Park site, particularly between the western shoreline of the Riverside site and Ferry Baker Island to the east. Dominant species in this area include cattails, rushes, and sedges (Pentec 2004). Dominant intertidal salt marsh vegetation along the western shoreline of the river includes a narrow strip of mudflat and an approximately 75- to 100-foot wide low salt marsh bench of predominately native species including Lyngby's sedge, silverweed (*Potentilla anserina*) and baltic rush (*Juncus balticus*), and seaside arrowgrass (*Triglochin maritimum*).

The intertidal edges of Jetty Island support a variety of native intertidal species due to experimental planting efforts in the early 1990's and some natural colonization of the area. In 1991, Jetty Island was experimentally planted with a variety of native intertidal saltmarsh, targeting particular elevation zones. Subsequent field monitoring in early September 1993 and late August 1995 documented the survival and spread of fleshy jaumea, seashore saltgrass *(Distichlis spicata),* and American dunegrass *(Elymus molis)*

in the upper elevation zone as well as fleshy jaumea and pickleweed in the lower elevation zone. American dunegrass was planted and also naturally recruited into the upper edges of the supralittoral zone (Pentec 1997).

4.3.2 Wetland and Riparian Vegetation

Prior to the mid-19th century, approximately two-thirds of the Snohomish River estuary was composed of forested wetland (Haas and Collins 2001). Currently, greater than 80 percent of the riparian zone is cleared or in an early successional stage. Eighty-five percent of historic tidal marsh is no longer intact (Haas and Collins 2001). Approximately 44 miles of dikes isolate the river from its riparian floodplain (Snohomish River Basin Salmonid Recovery Technical Committee 2002).

Similar to the distribution of intertidal vegetation, the quality and distribution of wetland and riparian vegetation differs between the upstream settling basin and the downstream settling basin due to the degree of shoreline development. The riparian zone adjacent to the downstream settling basin is dominated by scattered trees, predominately red alder (*Alnus rubra*), with an understory dominated by invasive shrubs such as Himalayan blackberry (*Rubus discolor*). The riparian zone adjacent to the upstream settling basin is denser and more diverse, but still limited and somewhat degraded by the adjacent City of Everett sewage treatment ponds. Riparian areas in the vicinity of the upstream settling basin are dominated by Sitka spruce (*Picea sitchensis*), Pacific willow (*Salix lucida*), Scouler's willow (*Salix scouleriana*), western red cedar (*Thuja plicata*) and black cottonwood (*Populus balsamifera*) trees with an understory of salmonberry (*Rubus spectabilis*), red elderberry (*Sambucus racemosa*), red-osier dogwood (*Cornus sericea*), Nootka rose (*Rosa nutkana*), Douglas spirea (*Spirea douglasii*), and western crabapple (*Malus fusca*). Common invasive species include reed canarygrass (*Phalaris arundinacea*), Himalayan blackberry, and evergreen blackberry (*Rubus laciniatus*).

Riparian vegetation is limited on the Riverside site to a narrow strip of young trees and shrubs along the edge of the site, waterward of the berm that contains the water/sediment slurry. This area is dominated by red alder with a largely invasive understory of Himalayan blackberries and Scot's broom.

There are no wetlands located within the dredged material cell of the Riverside site. Two wetlands are located along the western edge of the southern portion of the site (Wetlands A and B), one wetland is located along the eastern edge of the site adjacent to the river (Wetland C), and one wetland is located off of the southern boundary of the site (Wetland D) (Figure 5). Wetland A is a very small (approximately 128 square feet) isolated topographic depression dominated by largely invasive emergent vegetation (Talasaea Consultants 1998). Wetland B is largely located offsite, but approximately 518 square feet extend onto the Riverside property. Wetland B is a palustrine emergent and scrub-shrub wetland associated with a drainage ditch (Talasaea Consultants 1998) and is separated from the dredged material cell by the sand berm that contains the water/sediment slurry. Wetland C is the intertidal salt marsh bench that extends along the shoreline of the site and is dominated by Lyngby's sedge, hardstem bulrush, silverweed, baltic rush, and seaside arrowgrass. Wetland D is located off-site to the south on

property owned by the City of Everett. The wetland consists primarily of emergent vegetation interspersed with scrub-shrub vegetation (Talasaea Consultants 1998).

There are no wetland plant communities on Jetty Island and the trees and shrubs which have established there occur only along the top of the island and thus do not overhang the shoreline or function as riparian communities.

Riparian forests and palustrine forested, scrub-shrub, and emergent wetlands dominate the islands between the river's sloughs. Otter Island, Ebey Island, Spencer Island, and Smith Island are dominated by dense wetlands of Sitka spruce, western red cedar, red alder, and black cottonwood.

4.3.3 Upland Vegetation

Because the majority of the land within the lower estuary is brackish or freshwater wetland, or former wetland that is currently being farmed, areas of upland vegetation are limited. Dominant plant species scattered on high ground include big-leaf maple (*Acer macrophyllum*), black cottonwood, red alder, and Douglas fir (*Pseudotsuga menziesii*).

For the majority of the Riverside site, the upland plant communities are restricted to mowed herbaceous fields interspersed with compacted bare ground (Port of Everett 1999). There is no vegetation in the dredged material cell on the southern portion of the site. The highest elevations of Jetty Island support upland species including bighead sedge (*Carex macrocephala*) and beach peavine (*Lathyrus japonicus*), as well as trees and shrubs including black cottonwood and invasive shrubs such as Scot's broom (*Cytisus scoparius*) and Himalayan blackberry.

4.4 AQUATIC INVERTEBRATES AND FISH

4.4.1 Aquatic Invertebrates

Lower Snohomish River, Riverside site, and Jetty Island

Benthic and epibenthic invertebrate prey assemblages associated with the intertidal habitats created in and around Jetty Island have been documented by the Port of Everett as part of their post-construction monitoring of the island (Pentec 1996). Their studies have documented rapid colonization and high epibenthic zooplankton productivity in the mudflats within the protected embayment formed by the berm (Pentec 1996). Since 1990, qualitative excavations have shown a continual increase in the apparent density and diversity of the infaunal community, including polychaetes, crustaceans, and mollusks. The density and diversity of invertebrate assemblages within and around Jetty Island, as well as within the larger Snohomish River estuary is also evidenced by the migratory and year-round use of the area by foraging shorebirds (as described below in Section 4.5.1)

Pentec Environmental has documented invertebrate species assemblages within the lower Snohomish River (mainly downstream of the upstream settling basin) as part of their work for the Port of Everett (1992). Common invertebrate species (which are typically preyed upon by salmonids) include: snails (*Littorina* spp.), polychaetes (*Nereis* spp, *Notomastus* spp., *Nephtys* spp. *Glyceria* spp.), shore crabs (*Hemigrapsus* spp.), isopods (*Gnorimosphaeroma oregonensis*), ghost shrimp (*Callianassa* spp.), Dungeness crab (*Cancer magister*), and red crab (*Cancer productus*). Juvenile salmonids also prey preferentially on certain species of tiny crustaceans including amphipods (e.g.,*Corophium* spp., *Anisogammarus, Eogammarus*), some species of harpacticoid copepods (e.g., *Harpacticus uniremis, Tisbe* sp.), cumaceans, opossum shrimp, and midges (*Chironomidae* larvae) which are also common in the intertidal mudflats and marshes of the lower estuary. These species would also be expected within the salt marshes and mudflats that fringe the shoreline of the Riverside site.

While the types of benthic invertebrates characteristic of intertidal habitats within the estuary and associated with Jetty Island have been studied and documented over the past five years, benthic assemblages within the deeper, subtidal portions of the settling basins and dredged portions of the navigation channel are not well documented, although they are expected to be of much lower biodiversity than those of the adjacent intertidal marshes and mudflats due to their depth and regular pattern of disturbance due to the accumulation of fine sediments and periodic maintenance dredging. Because of their occurrence at deeper depths, the assemblages within the center of the basins and navigation channel are also likely of lower functional value to foraging juvenile salmonids that tend to forage in the intertidal areas closer to the shoreline.

Marine Sediment Unit and PSSDA Sites

Common marine invertebrates on the intertidal piling surfaces, riprap, and bulkhead areas of the Marine Sediments Unit (MSU) include barnacles, tube-dwelling worms, sea anemones, sponges, tunicates, and mussels. Marine invertebrates documented or anticipated to utilize the offshore subtidal habitat of the MSU include a variety of polychaetes, clams, mussels, crabs, and shrimp.

The benthic infauna at the PSDDA open water disposal site is dominated by large polychaetes and bivalve mollusks. Polychaetes make up 51 percent, mollusks 39 percent, and crustaceans only 4 percent of the biomass (USACE 2000b). Benthic infauna at the Port Gardner site are also dominated by large polychaetes and bivalve mollusks with polychaetes making up 50%, bivalves 42%, and crustaceans only 2.4% of the biomass (USACE 2000b). Other common invertebrates occurring in Elliott Bay and Port Gardner Bay include anemones, various shrimp, nudibranches, sponges, and sea cucumbers. Barnacles, bay mussels, limpets, and snails are typical invertebrates found on rocky or other hard intertidal substrata.

EPA has demonstrated that important benthic and epibenthic prey assemblages exist within the PSR Superfund site and the Marine Sediment Unit, including species

researchers have considered sensitive to pollution. However, sample areas that were associated with known contaminated sediments showed a distinctly different benthic community. The dominant species at the contaminated locations are all polychaete worms that are frequently associated with stressed habitats. EPA concluded that the presence of contaminated sediment in unremediated areas adversely affects the species diversity and abundance of benthic organisms and therefore affected the diversity and abundance of the prey resources available to migrating salmonids.

4.4.2 Anadromous Salmonids

The use of both Port Gardner Bay and Elliott Bay (near the PSSDA disposal site and the Marine Sediment Unit, respectively) by adult anadromous salmonids is predominantly as a migration corridor from the Pacific Ocean and Puget Sound into the main stem of the Snohomish and Duwamish Rivers. Adult salmon use deeper areas of Port Gardner Bay and Elliott Bay prior to moving into the rivers during the fall. The following spring, juvenile salmonids out-migrate from the rivers through Port Gardner Bay and Elliott Bay, using the estuarine intertidal areas for foraging and transitioning to salt water.

The Snohomish River and its estuary support runs of seven salmonid species: chinook (*Oncorhynchus tshawytscha*), coho (*O. kisutch*), chum (*O. keta*), and pink salmon (*O. gorbuscha*), as well as steelhead trout (*O. mykiss*), sea-run cutthroat trout (*O. clarki*), and native char (recently broken into two species - dolly varden (*Salvelinus malma*) and bull trout (*Salvelinus confluentus*). All species spawn in freshwater upstream of the estuary, and adult use of the estuary (and therefore of the proposed dredging areas) is largely limited to use a migration corridor and as a physiological transition area from salt to fresh water. In contrast, juvenile salmonids depend on estuarine environments for migration, physiological transition from fresh to salt water, feeding, and refuge from predation during migration. There is considerable variation by species in juvenile residence periods in the estuary, with coho, chum, and chinook juveniles being relatively more dependent on the estuarine environment than pink, steelhead, sea-run cutthroat and native char, which quickly move through the estuary to marine waters.

Snohomish River coho salmon stocks are considered depressed, while Skykomish, South Fork Skykomish, and Snoqualmie stocks are considered healthy (WDFW SASI 1994). Snohomish River coho spawn between late October and January and utilize almost all of the accessible tributaries draining into the Snohomish system, including: the Pilchuck River, Quilceda Creek and tributaries, French Creek, Allen creek and tributaries, Catherine Creek, Star Creek, Dubuque Creek, Panther Creek, Bunk Foss Creek, and Pilchuck Creek and tributaries, as well as in tributaries to the Skykomish River such as Woods Creek, the Wallace River, and the Sultan River. Juvenile coho salmon may spend a year in fresh water before moving into the estuary between March and May to feed in intertidal marshes and mudflats.

Snohomish River basin fall run chum are divided into Skykomish, Snoqualmie, and Wallace River stocks, all of which are considered healthy or unknown (WDFW SASI 1994). Chum salmon spawn between October and December, with peak around early to mid-November. Skykomish chum spawn in the mainstem Skykomish upstream at least

to Proctor Creek and in the Pilchuck River; Snoqualmie chum spawn in the Snoqualmie River and the Tolt River, and may occur in other places as well; Wallace River chum spawn in the Wallace River at its tributaries including Olney Creek and Ruggs Slough (WDFW SASI 1994). Juvenile chum salmon are strongly associated with estuarine habitats, spending as little as 30 days in fresh water after emergence. Juveniles are generally present within the Snohomish River estuary from April through June where they feed in intertidal marshes and mudflats on a variety of insects, amphipods, and harpacticoid copepods.

Both species of native char (bull trout and Dolly Varden) are believed to coexist in the Snohomish River drainage. Bull trout migrate and are captured throughout the inner bays of northeast Puget Sound from Possession Sound, Port Susan, Skagit Bay, Padilla Bay, out to Whidbey Island (F. Goetz, USACE, unpublished data). Current information suggests that bull trout first enter tidally influenced waters in Puget Sound as age-2 fish. The seasonal timing of entry extends from mid-February to early September. Upon entry, the juvenile fish may elect to rear in the tidally influenced delta within intertidal marsh, distributary channels, or along mainstem habitat areas, or may pass through into nearshore marine areas. Larger juveniles may elect to migrate substantial distances through the nearshore marine environment from the natal river basin to adjacent areas.

The use of the Snohomish River and its estuary by bull trout is not well known. Subadult bull trout have been observed or captured in three restored and two natural tidal channels and larger distributary channels, including areas along the lower Snohomish River, specifically: two small tidal channels off Steamboat Slough (M. Rowse, NMFS, unpublished data, 2002), Union Slough, in the spring of the first year after dike removal and restoration of Spencer Island (Tanner et al. 2002), and all three distributary channels of the Snohomish River – Union, Steamboat, and Ebey Sloughs in upstream and downstream migratory movements during spring, summer, and fall of 2002 (F. Goetz, USACE, unpublished data, 2002). The Corps has been conducting a multi-year acoustic telemetry study of sub-adult and adult bull trout use of nearshore marine waters from the Snohomish River to Padilla Bay. As a federally threatened species, the occurrence and potential effects of the proposed dredging and disposal activities on bull trout are specifically addressed in detail in Section 6.5 of the Biological Assessment (USACE 2003), based largely on the results of this study.

Four chinook salmon stocks are present within the Snohomish River drainage: Snohomish summer chinook, Snohomish fall chinook, Bridal Veil Creek fall chinook, and Wallace River summer/fall chinook (WDFW SASI 1994). The spring-run chinook salmon population formerly present is now considered extinct (Nehlsen et al. 1991). The Snohomish summer- and fall-run populations, maintained by natural production, are classified as depressed (Priority Habitat and Species database search August 22, 2003, WDFW SASI 1994). Habitat degradation in the mainstem river due to agricultural diking and industrial pollution, in addition to a lack of large woody debris and gravel removal are believed to negatively affect production of the Snohomish River summer and fall stocks (WDFW SASI 1994). The Wallace River stock is considered to be a mixture of wild stocks and hatchery straying. The Wallace River stock is considered healthy and the

Bridal Veil Creek stock status is unknown due to sparse survey data (WDFW SASI 1994).

Adult chinook return to the estuary and begin to reenter fresh water beginning in June and July and continuing through August and September. Out-migrating chinook salmon juveniles are present in the estuary from April through July. As a federally threatened species, the occurrence and potential effects of the proposed dredging and disposal activities on chinook salmon are addressed in detail in Section 6.6 of the Biological Assessment (USACE 2003).

4.4.3 Forage Fish

Forage fish include Pacific herring, surf smelt, and sand lance prey on epibenthic invertebrates and crustaceans and are themselves important prey items for larger juvenile salmon and bull trout. Sand lance is particularly important for juvenile chinook and bull trout. Both juvenile surf smelt and sand lance have been captured by Pentec during seining within the lagoon formed by the berm on Jetty Island (Pentec 1996) and are abundant in the shallow waters of the Snohomish River estuary and the nearshore marine waters of Possession Sound and Port Gardner Bay. None of these forage fish species spawn at the open water disposal sites or within the upstream or downstream settling basins or the navigation channel due to the modified shoreline and lack of intertidal gravel and sandy beaches (WDFW PHS database 2003).

The closest areas of surf smelt spawning occur on to the south of the Everett Naval Station along the Mukilteo shoreline, along the southern shore of Whidbey Island and Port Susan, and along the southeastern shore of Whidbey Island (WDFW PHS database 2003, D. Pentilla undated). Documented Pacific sand lance spawning beaches occur in these same areas, as well as use of the Gedney Island shoreline (WDFW PHS database 2003, D. Pentilla, undated). Pacific herring spawn within along the shoreline northwest of the Tulalip Indian Reservation and along the eastern shore of Camano Island (WDFW PHS database 2003, D. Pentilla undated).

4.5 WILDLIFE

4.5.1 Birds

Bald eagles are occasionally seen flying over the Marine Sediment Unit and the PSSDA open water disposal site in Elliott Bay, as well as over the Port Gardner Bay PSSDA site. Bald eagles are commonly seen flying over Possession Sound and are frequently seen perching and foraging along the lower Snohomish River. Several bald eagle nests occur within three miles of the downstream settling basin and Jetty Island and within four miles of the upstream settling basin and the Riverside Business Park site. As a federally threatened species, the occurrence and potential effects of the proposed dredging and disposal activities on bald eagles are addressed in detail in Section 6.2 of the Biological Assessment (USACE 2003).

Similarly, the marbled murrelet is a permanent, though not common resident of southern Puget Sound in the vicinity of the open water disposal sites and the lower Snohomish River. In the Pacific Northwest, it forages almost exclusively in the nearshore marine environment (mainly within a few miles of shore), but nests in old growth forests as much as 50 miles from marine waters. Marbled murrelet nests do not occur within the action area, but murrelets may forage within the waters of Elliott Bay or Possession Sound, particularly during the winter. As a federally threatened species, the occurrence and potential effects of the proposed dredging and disposal activities on marbled murrelets are addressed in detail in Section 6.3 of the Biological Assessment (USACE 2003).

The shorelines of and the waters overlying the Marine Sediment Unit provide habitat to a number of terrestrial and water dependent birds that may serve as prey for bald eagles. These species include loons, grebes, cormorants, scaups, mergansers, coots, and gulls. The majority of these birds utilize the water column habitat in the vicinity of the MSU during their respective over wintering periods. These over wintering waterfowl species are generally found in the central Puget Sound region from early November through late April, with the highest concentrations during December through February. The remaining waterfowl are present year-round. Most of the year-round and over wintering species are classified as “divers” and actively pursue pelagic and benthic organisms up to 30 feet or more below the water surface.

The Snohomish River estuary is recognized as regionally important during spring migrations of shorebirds and fall migrations of raptors and waterfowl. The abundant waterfowl, marine birds, and shorebirds within the lower Snohomish River provides an avian prey base for bald eagles peregrine falcons, merlins, and other raptors. Common species include ring-necked ducks, American wigeons, Canada geese, mallards, pintail, scoters, mergansers, and bufflehead. Other common species include double-crested cormorants, western grebes, American coots, brants, pigeon guillemots, and several gull species (Pentec 1992). During winter migrations, the flooded agricultural fields along the lower Snohomish River attract snow geese, trumpeter swans, snowy owls, merlins, great-horned owls, and gyrfalcons (Ken Brunner, USACE, personal communication). Shorebirds are commonly observed along the lower river in the tidal mudflats and marshes or along sandy shorelines. Common species include dunlins, western sandpipers, dowitchers, black-bellied plovers, and yellowlegs (City of Everett et al. 1997). Eighteen species of shorebirds have been observed and over 8,700 individuals were reported on April 27, 1995 using the habitats on the Jetty Island berm (Pentec 1996)

Several other bird species that inhabit the action area are either Federal Species of Concern or are listed by Washington State as Monitor, Candidate, or Sensitive species. The peregrine falcon (Federal Species of Concern and State Sensitive), osprey (State Monitor), great blue heron (State Monitor), and purple martin (State Candidate) all occur within the action area and have been observed either near the open water disposal sites or along the lower Snohomish River.

Since 1994, a pair of peregrine falcons has been nesting atop the east side of the Washington Mutual Tower, seven miles to the east of the MSU and the Elliott Bay PSSDA site in downtown Seattle. While this pair has not been active at the Washington Mutual site in 2003, the female may be nesting about four blocks away at One Union Square and the male may be nesting with other females in West Seattle. Another pair of peregrine falcons is reported to be nesting on the SR 529/Highway 10 bridge over the Snohomish River, approximately 2 miles upstream of the downstream settling basin and 2 miles downstream of the upstream settling basin (Priority Habitat and Species database search August 22, 2003). Peregrine falcons would be expected to hunt waterfowl over the disposal sites in Possession Sound and Elliott Bay, and within the vicinity of the settling basins in Port Gardner Bay. Peregrine falcons would also be expected to hunt waterfowl and pigeons over the lower Snohomish River and associated shoreline industrial and marine facilities.

Osprey are frequently seen foraging for fish over Possession Sound, Port Gardner Bay, Elliott Bay and the lower Snohomish River and appear to be fairly tolerant of human disturbance when choosing nesting locations. Approximately 20 osprey nests have been documented over the last decade within a mile of the downstream settling basin in Port Gardner Bay (Priority Habitat and Species database search August 22, 2003). Many of these nests were active in 2003.

Similarly, great blue herons are also frequently seen wading within the intertidal areas of the lower Snohomish River. Bald eagles are known to disrupt rookeries while attempting to prey upon young herons. There is an active heron rookery documented approximately 1.5 miles northeast of the upstream settling basin on Spencer Island. Other nesting activities documented within the area include a rookery northwest of the downstream settling basin at Priest Point and a nest at the south end of Lake Stevens (Priority Habitat and Species database search August 25, 2003).

In recent years, private individuals have erected purple martin nest boxes around Puget Sound and the lower Duwamish and Snohomish Rivers and these boxes have successfully attracted nesting purple martins. As of 2000, 40 nest boxes had been constructed at the Everett waterfront north of the 10th Street boat launch, just upstream of the downstream settling basin and have variously supported nesting purple martins (Priority Habitat and Species database search August 25, 2003).

The horned grebe and red-necked grebe (State Monitor species), as well as the western grebe, Brandt's cormorant, merlin, and common murre (all of which are State Candidate species) and the common loon (State Sensitive species) are also likely to forage over or utilize surface waters associated with the MSU in Elliott Bay.

4.5.2 Marine Mammals

Steller sea lions are known to migrate into Puget Sound and have been sporadically seen in inland water areas, including the San Juan Islands, rock outcroppings along the Strait of Juan de Fuca, near Everett, in Shilshole Bay, off the Ballard Locks, and occasionally

in south Puget Sound. However, they are not considered common residents of the action area, with no breeding rookeries identified in Washington, and haul-out areas generally confined to the Columbia River, the western and northern coasts of the Olympic Peninsula, and the coast of Vancouver Island and the Gulf Islands in British Columbia. As a federally threatened species, the occurrence and potential effects of the proposed dredging and disposal activities on Steller sea lions are addressed in detail in Section 6.4 of the Biological Assessment (USACE 2003).

Harbor seals and Dall's porpoise are known to frequently forage in Elliott Bay and are both State Monitor Species (Calambokidas 1991). Juvenile California gray whales (State Sensitive Species) occasionally stray into Puget Sound and forage in the mud and sandflats of the Snohomish estuary. Harbor seals are also common within the lower Snohomish River where they forage for fish. Similarly, orca whales and Pacific harbor porpoise are also common within Elliott Bay and Possession Sound and are both State Candidate Species (Calambokidas 1991). Pacific harbor porpoise and California sea lions are also common inhabitants of the action area. Pacific harbor porpoise and harbor seals are year-round residents. California sea lions frequent the log boom adjacent to the Navy pier at the Everett Naval Station and may also utilize waters of Elliott Bay in the winter to feed on migrating salmon and steelhead trout (Pfeifer 1991). Both harbor seals and California sea lions have been seen hauled out on floats and navigation buoys moored within the Marine Sediment Unit and have documented haulout areas just off of Everett in Possession Sound.

4.5.3 Terrestrial Species

The undeveloped habitats of the Snohomish River estuary serve as corridor, linking urban and rural open spaces from the Cascade foothills to Puget Sound lowlands and waters. Various terrestrial mammals inhabit the area including beaver, river otter, muskrat, black-tailed deer, rabbits, coyote, raccoon, and a variety of small rodents including mice, rats, moles, and voles. Resident amphibians likely to inhabit the shoreline area include red-legged frogs, Pacific chorus frogs, rough skinned newt, and the non-native bullfrog. Resident reptiles include garter snake and possibly Northern alligator lizard.

4.6 THREATENED AND ENDANGERED SPECIES

In accordance with Section 7(a)(2) of the Endangered Species Act of 1973, as amended, federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed and proposed threatened or endangered species. In September 2003, the Corps entered into an informal consultation with the U.S. Fish and Wildlife Service (USFWS) and NOAA Fisheries via preparation of a Biological Assessment (BA) regarding routine maintenance dredging and disposal activities in the Federal navigation channel. The BA was amended with updated project timing and disposal site information via November 13, 2003 and May 28, 2004 letters from the Corps. The BA for this project (USACE 2003) addressed the known occurrences and the potential impacts of the proposed project on the following species under the jurisdiction of USFWS and NOAA

Fisheries (Table 1). This list of endangered and threatened species is based on species lists provided by USFWS for previous maintenance dredging and the NOAA Fisheries website.

Table 1. Threatened and Endangered Species Addressed in the Biological Assessment

Common Name	***Scientific Name***	**Federal Listing Status**	**Has Critical Habitat Been Designated?**
Bald Eagle	*Haliaeetus leucocephalus*	Threatened – July 12, 1995 Delisting proposed - July 6, 1999	No
Marbled Murrelet	*Brachyramphus marmoratus*	Threatened – October 1, 1992	Yes, designated on May 24, 1996
Steller Sea Lion	*Eumetopias jubatus*	Threatened – November 26, 1990	No
Puget Sound/Coastal Bull Trout	*Salvelinus confluentus*	Threatened – November 1, 1999	No
Puget Sound chinook salmon	*Oncorhynchus tshawytscha*	Threatened – March 24, 1999	Yes, designated on February 16, 2000

Other Federally listed threatened or endangered species that may occur in Puget Sound include the humpback whale (*Megaptera novaengliae*; endangered) and leatherback sea turtle (*Dermochelys coriacea*; endangered). However, these species are extremely unlikely to occur within the lower Snohomish River, Port Gardner Bay, Jetty Island, or Elliott Bay based on extremely infrequent historic occurrences and a lack of typically utilized and appropriate habitat within the action area. These two species were therefore not specifically evaluated in the BA, as the proposed dredging and disposal activities would have *no effect* on these two species.

As noted in the BA, both USFWS and NOAA Fisheries (USFWS 2003b, NMFS 2003c) have previously concurred with effect determinations for bald eagle, marbled murrelet, bull trout, and Puget Sound chinook salmon related to the beneficial use of the dredged materials for capping of the MSU portion of the PSR Superfund site, as presented in a Biological Assessment prepared for the PSR Superfund Site (USACE and EPA 2002). Similarly, both USFWS and NOAA Fisheries have also concurred (USFWS 2000, NMFS 2000) with effect determinations for these species related to disposal of dredged material at the PSDDA open water site at Port Gardner, as presented in the Programmatic Biological Evaluations prepared for the PSDDA Non-Dispersive Disposal Sites (USACE 2000a and 2000c). NOAA Fisheries has also concurred with Essential Fish Habitat consultation for the PSDDA open water disposal sites (NMFS 2003b).

Therefore, the BA prepared for this project focused specifically on effects of the routine maintenance dredging in fiscal years 2005 through 2009 of the downstream and upstream basins and adjacent portions of the channel. The BA addressed the effects from the disposal of dredged materials at the PSSDA and PSR Superfund sites in a summary manner and referenced the more detailed material presented in the respective BA documents and concurrence letters.

Informal consultation concluded with a NOAA Fisheries concurrence letter dated October 31, 2003 as well as via December 15, 2003 and July 22, 2004 emails from NOAA Fisheries concurring with the effect determination of "may affect, but not likely to adversely affect" for species under the jurisdiction of NOAA Fisheries for the period of FY 2005-2009 (Appendix B). USFWS concurred with the effect determination of "may affect, but not likely to adversely affect" for species under the jurisdiction of USFWS, via a letter/email dated December 16, 2003 and July 22, 2004, for the FY 2005 dredging and disposal operations only (Appendix B). Therefore, the Corps will annually reconsult with USFWS for dredging and disposal operations to be conducted under this Public Notice beyond FY 2005.

If during FY 2006 to 2009, dredged material is appropriate and needed for beneficial use at either the Jetty Island site or the other upland sites described in Section 3.2.3 and 3.2.4, detailed consultation with USFWS and NOAA Fisheries regarding extent, elevation, timing, or methods of placement would again be conducted via an amendment to the BA.

4.7 CULTURAL RESOURCES AND NATIVE AMERICAN CONCERNS

Dredging Guidance Letter No. 89-01 (March 13, 1989) states that it is the policy of the Corps of Engineers that cultural resources surveys should not be conducted for maintenance dredging and disposal activities proposed within the boundaries of previously constructed navigation channels or previously used disposal areas. The proposed maintenance dredging does not deepen, widen, or otherwise change the location or configuration of the established navigation channel, settling basins, or disposal sites. Accordingly, no new cultural resources surveys were conducted for this project.

Based on previous research by the Corps archeologist and review of the dredging and disposal locations by the Tulalip Tribe, there does not appear to be any cultural resources located associated with the downstream or upstream settling basins, the navigation channel, Jetty Island, or the potential upland disposal sites. Similarly, there are no cultural resources listed for the project area that are eligible for the National Register. This information was previously coordinated with the State Historic Preservation Office in March 1988.

The lower Snohomish River is within the usual and accustomed fishing areas for the Tulalip Tribe. However, the Tulalip Tribe has expressed no concerns regarding the past rounds of maintenance dredging in the navigation channel, upstream or downstream settling basins.

4.8 LAND USE

No federal lands are located within the project area; all lands are either public or privately owned. Public owners include Snohomish County, Port of Everett, Washington Department of Fish and Wildlife, Washington Department of Natural Resources and Parks, and the City of Everett. The publicly owned lands are primarily intertidal lands along the river channel, as well as lands used as open space and wildlife habitat, with some areas such as Spencer Island and Jetty Island open for recreation. The City of Everett operates the sewage lagoon facilities at the south end of Smith Island. The Tulalip Tribe owns the shoreline and tidelands along the Priest Point coast and north of Tulalip Bay. Privately owned lands within the lower estuary are primarily used for agriculture (the northern half of Smith Island and South Ebey Island) and for commercial, industrial, and military facilities along the shoreline (such as the Everett Yacht Club, Marina Village, and the Everett Naval Station). Much of the eastern shoreline of Port Gardner Bay (as well as the adjacent shorelines of Puget Sound) is armored with riprap. Common shoreline features also include constructed bulkheads and piers, principally for large commercial and industrial marine users.

The Port of Everett is a major exporter of logs to Asia, and the Port also supports the U.S. Naval Station Everett, home to the USS Abraham Lincoln, numerous support ships, and some 2,400 naval personnel. The Everett Marina at the southern end of the navigation channel is the largest in the Pacific Northwest and the second largest on the west coast, supporting some 2,300 boats. The downstream settling basin is immediately west of the Everett Marina (Figure 1). The navigation channel is thus subject to intense marine traffic ranging from commercial vessels, and recreational boaters, to sports anglers and hand-launch kayakers and canoeists.

Nearly all the upland areas in the project vicinity are now used for industrial, commercial, residential, or agricultural purposes. In many instances, such urban land usage was historically made possible by the conversion of intertidal wetlands to uplands using dredged material as fill and by diking to eliminate tidal influence and allow farming of the rich river delta soils. However, many of these historically diked areas have not been redeveloped or have been abandoned and the dikes not maintained (usually in formerly farmed areas). The precise character of these transitional areas depends on the nature of previous land use and the elevation and water regime of the area. These areas provide habitat for wildlife and may receive some passive recreational use by bird watchers or duck hunters (where allowed).

Large areas of undeveloped habitat remain on the estuary's six major islands, particularly on Spencer, Otter, and South Ebey Island, all of which are located upstream of the upstream settling basin (Figure 1). The southern end of Spencer Island (just upstream of the upstream settling basin) has been restored by a dike breach to restore tidal influence to the island's wetlands. Wide shoreline mudflats are found along Steamboat and Ebey Sloughs and the majority of the eastern islands have broken dikes and are thus again

subject to tidal inundation. These areas are typified by the presence of fresh or brackish water marshes that support extensive intertidal and freshwater wetlands.

4.9 RECREATIONAL USE

Some of publicly owned lands within the lower Snohomish River estuary are used for passive recreation such as bird and wildlife watching and hiking; the tidal sloughs and creeks in the area are also used by motor boaters, kayakers, and canoeists for recreation and to access some of the estuary's more isolated islands. The City of Everett's sewage lagoon ponds are popular destinations for bird watchers. Duck hunting is allowed on the northern end of Spencer Island on land owned by the Washington Department of Fish and Wildlife and on the west end of Smith Island. Spencer Island and Jetty Island open to the public for hiking, fishing, bird and wildlife watching, and picnics. The Everett Parks and Recreation Department provides interpretive ranger services, ferry transportation, and other activities and programs on Jetty Island between July 7 and September 5 each summer.

4.10 AIR QUALITY AND NOISE

Port Gardner Bay, the Everett Marina, and the shoreline of the lower Snohomish River are subject to frequent and periodically intense noise and disturbance associated with the commercial, maritime, and industrial facilities along the shoreline including marine traffic to and from the Everett Marina and the Everett Naval Station. The lower end of the river, including the downstream settling basin, is subject to recreational vessels of all types and sizes launching and mooring at the Everett Marina. Hand-launch vessels also frequent the lower estuary and sloughs near the upstream settling basin, but generate considerably less disturbance and noise than motorized vessels. Existing noise and disturbance levels are thus typically fairly high within the majority of the action area.

The Puget Sound region has been an attainment area for carbon monoxide since October 11, 1996; the Seattle-Tacoma area has been an attainment area for ozone since November 25, 1996. As of May 14, 2001, the Seattle, Tacoma, Kent areas were classified as attainment areas for particulate matter (PM10) pollution (J. Anderson, Puget Sound Clean Air Agency, pers. comm. October 22, 2003 via email). All other areas of King, Kitsap, Pierce and Snohomish counties within the jurisdiction of the Puget Sound Clean Air Agency are unclassified. Thus, the project area along the lower Snohomish River is within an unclassified area for ozone and particulate matter.

4.11 TRANSPORTATION & NAVIGATION

Traffic within the vicinity of the downstream settling basin occurs principally along West Marine View Drive, which provides access to the Marina Village, Everett Yacht Club, Marine Park, and the Everett Naval Station. Traffic volumes are highest during peak

commuting hours, but are sustained throughout the day by changes in shifts at the Naval Station, tourism to the Marina Village, and recreational and commercial vessels launching from the boat launch. There is comparatively little traffic within the vicinity of the upstream settling basin. Ross Avenue parallels the east side of the river leading through the Langus Riverfront Park to the City of Everett's sewage lagoon facilities and 4th Street Southeast which provides access to parking for Spencer Island. East Grand Avenue crosses under Interstate 5 along the west side of the river near the upstream settling basin and provides local access to the area.

Boat traffic on the lower river within the vicinity of the downstream settling basin consists of commercial seaworthy vessels, recreational boats of all sizes, and military vessels entering and leaving the Everett Naval Station. Farther upstream, the navigation channel supports moderate river traffic of commercial and recreational fishing vessels. The Tulalip Tribal Nation uses the area for their harvest of accustom and native species. Primarily small motorboats, kayaks, and canoes use the upper portion of the estuary near the upstream settling basin due to the shallow water and navigational hazards during outgoing tides.

4.12 AESTHETICS

Due to its highly developed character, the visual and aesthetic resources within the vicinity of the downstream settling basin and the navigation channel are limited. Jetty Island is visible to the west of the navigation channel and provides aesthetic interest and recreational opportunities to the area. Visual interest and aesthetics improve upstream within the navigation channel. The extensive mudflats along the northern end of Jetty Island and the mouth of the Snohomish River provide bird and wildlife watching opportunities to local residents and boaters. Aesthetics also improve along the navigation channel within the vicinity of the upstream settling basin. Areas of intertidal marsh vegetation, overhanging riparian vegetation, and undeveloped portions of South Ebey Island, Spencer Island, and Smith Island provide visual interest, largely through bird and wildlife watching opportunities to the area.

5. ENVIRONMENTAL EFFECTS OF THE PREFERRED ALTERNATIVE

5.1 PHYSICAL CHARACTERISTICS

No Action Alternative
Under the No Action Alternative, the physical characteristics of the lower Snohomish River and estuary would slowly change through time as sediments are steadily transported downstream and shoal within the channel and settling basins. The basins would gradually fill with shoaled sediments and would ultimately pose a hazard to navigation within the lower river. The PSSDA open water disposal site would continue to be used for approved open water disposal of appropriate sediment, but would not receive sediments dredged from the downstream settling basin. Under the No Action Alternative, capping of the Marine Sediment Unit of the PSR Superfund site would be delayed without the volume of dredged material available from the shoals in the downstream and upstream settling basins. The Jetty Island berm would continue to erode, ultimately culminating at some point in the future in the loss of the beach, upland, and intertidal habitats created by the berm. Similarly, filling the alternative upland sites along the lower Snohomish River, including the Riverside Business Park site, would also be delayed if sediments from the upstream settling basin and channel were not dredged.

Preferred Alternative: Maintenance Dredging and Disposal
Under the Preferred Alternative, the downstream and upstream settling basins and their adjacent portions of the navigation channel would be dredged to their authorized depths (including allowable over-depths) and the shoaled sediments removed from the lower river. This would increase the cross-sectional area of the river in these areas and would restore the capacity of these areas to accumulate sediments transported down river. The removal of the shoaled sediments would not change the physical characteristics of the river in areas outside of the authorized navigation channel and settling basins and would not alter the intertidal areas adjacent to the navigation channel and settling basins.

Under the Preferred Alternative, the Marine Sediment Unit of the PSR Superfund site would receive dredged sediments from both the upstream and the downstream settling basins in FY 2005 for use as capping material. The sediments would cap all or a large portion of the RA5a and RA5b areas and would help limit the mobilization, resuspension, and transport of the contaminated sediments in those areas. Using the dredged material to cap these areas would also physically isolate the contaminated sediments from local benthic organisms (and from their associated food webs). The PSSDA open water disposal site would receive any dredged sediments not approved or needed for use at the PSR Superfund site or Riverside Business Park site, as well as from other regional sediment removal operations.

Under the Preferred Alternative, the Port of Everett would use the dredged sediments from the upstream settling basin and channel to provide clean material to other sites after rehandling at the Riverside Business Park site. In the future (FY 2006 through 2009),

alternative upland disposal sites could also beneficially use the dredged sediments for similar purposes. The use of the dredged sediments would increase the relative elevation of the uplands in the locations where the sediments were deposited. Jetty Island could receive dredged sediments from the lower settling basin and channel to increase the relative elevation of portions of the island and offset erosion. While the island would continue to gradually erode, the dredged sediments would help to maintain the created intertidal habitats for the benefit of local fish and wildlife populations.

5.2 WATER AND SEDIMENT QUALITY

No Action Alternative

Under the No Action Alternative, sediments will continue to accumulate within the navigation channel and the settling basins and there would be no beneficial use of the sediments at either the PSR Superfund site or the Riverside Business Park site, nor would there be any sediment disposal at the PSSDA open water site. Because there would be no dredging, there would likely be no change to the water quality, turbidity, stream flow, dissolved oxygen, temperature, or degree of sediment contamination in the lower Snohomish River as a result of not conducting the proposed maintenance dredging in fiscal years 2005 through 2009. There would similarly not be any change in these water and sediment quality parameters at the beneficial use or disposal sites. However, in the absence of regular maintenance dredging, the continuous build-up of shoaled sediments would ultimately require dredging to maintain the navigational capabilities of the lower river. The ultimate removal and disposal of this greater quantity of sediments would likely have a higher degree of water quality, turbidity, and dissolved oxygen effects due to the longer duration of the dredging operation and the greater volume of accumulated sediments.

Preferred Alternative: Maintenance Dredging and Disposal

5.2.1 Water Contamination

The sediments of the settling basins and adjacent portions of the navigation channel are considered 'low-moderate' ranked for contaminates. PSSDA protocol sediment suitability testing determined on January 28, 2004 that sediments from the downstream settling basin and channel are appropriate for open water disposal at the Port Gardner PSSDA site. Sediments from the upstream basin were similarly tested in March 2004. On July 7, 2004, the results of this testing determined that the sediments from the upstream settling basin and channel are also appropriate for open water disposal at the Port Gardner PSSDA site.

EPA confirmed on April 27, 2004 that sediments from the downstream basin were acceptable for use as capping material for the PSR Superfund site via tests for the Washington State Department of Ecology's Sediment Management Standards (SMS) and Atterberg Limits. EPA is in the process of confirming that sediments from the upstream basin are also suitable for use as capping material for the PSR Superfund site. The sediment characterizations collected in calendar year 2004 have a 'recency frequency' of

five to seven years; contaminant testing will thus be required again in 2009 to 2011 prior to dredging.

The Washington Department of Ecology (WDOE) regulates water quality through a project specific Water Quality Certification and short-term Modification to the Water Quality Standards authorizations, if necessary to accommodate 'essential' activities. The Corps actively coordinated with the Washington Department of Ecology to obtain a Clean Water Act Section 401 Water Quality Certificate for this project, including a temporary water quality modification and associated points of compliance, as well as water quality monitoring during dredging and upland disposal activities. The Corps received a Section 401 Water Quality certificate for this project on September 17, 2004 (Appendix A).

In case water quality parameters exceed established standards, typical corrective measures include: (1) modifying the dredging activity or equipment; (2) reducing the dredging rate; or (3) stopping dredging operations. These corrective measures would apply until dredging operations demonstrated compliance with water quality standards. Compliance with WDOE Water Quality Certification standards is expected to minimize water quality impacts during dredging to levels that will not degrade water quality conditions within the action area.

Because of the testing regime and permitting conditions described above, no contamination of the water column as a result of the dredging or subsequent disposal at the PSSDA open water disposal site in Port Gardner Bay, use for capping at the PSR Superfund site, or use at the Riverside Business Park site is expected. Disposal activities will be conducted in accordance with established criteria for the sites. Effects of the disposal actions are analyzed in detail within the Biological Assessment previously prepared by the Corps (PSSDA site -USFWS 2000, NMFS 2000, NMFS 2003b; MSU site –USFWS 2003a, NMFS 2003a).

Therefore, temporary impacts to water quality during dredging are expected to be insignificant and discountable and are not expected to significantly degrade the existing water quality condition through water contamination within the action area or have adverse effects on listed species (as detailed in the 2005-2009 Biological Assessment, Corps 2003).

5.2.2 Turbidity and River Flow

Under the Preferred Alternative, temporary increases in turbidity are expected during active dredging of the settling basins and the channel (whether by clamshell or hydraulic pipeline dredge). Temporary increases in turbidity are also expected during release of the sediments from the bottom-dump barges and upon contact of the dredged sediments with the sea floor at the PSR Superfund site or the PSSDA open water site. More limited turbidity is expected once the hydraulically dredged sediments have settled out on an upland disposal site and the overflow water reenters the river. During dredging and disposal, suspended sediment concentrations vary throughout the water column, with

larger sediment plumes typically occurring at the river bottom closer to the contact point of the dredge. Concentrations typically then decrease exponentially moving away from the dredging site both vertically within the water column and horizontally across the bottom and decrease with the movement of the river current and tides. Areas of increased turbidity over background levels are expected to last only for a short duration during the dredging operations.

Such increases in turbidity could affect juvenile salmonids in the immediate vicinity of the active dredging operation if dredging were to occur when juveniles were present in the lower river. The primary determinant of risk is likely to lie in the spatial and temporal overlap between the area of elevated turbidity, the degree of turbidity elevation, the occurrence of the fish, and the other habitat options available to the fish for carrying out the critical function of their particular life-history stage (Nightingale and Simenstad 2001).

Any early migrating juvenile salmonids or adults that may be transiting through the downstream settling basin could hold in the adjacent intertidal areas along the eastern shoreline of Jetty Island until any areas of increased turbidity dissipates into background levels. Similarly, early migrating juvenile or adults transiting through the upstream settling basin or within the vicinity of the Riverside Business Park site could hold along the shoreline or move up into Union or Steamboat sloughs until the temporary turbidity dissipates.

While turbidity would be elevated on a temporary and localized basis by dredging, total suspended sediment levels sufficient to cause adverse effects would be very limited in extent and duration. However, in order to further reduce potential negative effects of turbidity on juvenile salmonids, even of limited duration, dredging operations would be timed between October 16 and February 14 specifically to avoid juvenile out-migration periods. This timing will dramatically reduce the temporal overlap between anticipated increases in turbidity during dredging and disposal and the presence of juvenile salmonids within the lower Snohomish River. This will consequently reduce the potential for exposure of juveniles to harmful levels of turbidity to a negligible level.

In addition, the proposed dredging would occur when background levels of turbidity are naturally higher due to high winter levels of precipitation and runoff; this further reduces the proportional effect of any temporary increases in turbidity. Water being returned to the river following sediment settling at the Riverside and Jetty Island sites would also be monitored for turbidity and dissolved oxygen to reduce potential water quality impacts.

Therefore, temporary increases in turbidity during dredging and disposal activities are expected to be insignificant and discountable and are not expected to result in long-term degradation of the existing water quality condition through increased turbidity within the action area or to have adverse effects on listed species (as detailed in the 2005-2009 Biological Assessment, Corps 2003).

5.2.3 Dissolved Oxygen

Dissolved oxygen concentrations tend to decline in the vicinity of dredging and disposal operations when the suspension of anoxic sediments creates high chemical oxygen demand. Under the Preferred Alternative, temporary decreases in dissolved oxygen associated with increased suspended sediments are possible in the immediate dredging area, whether clamshell or hydraulic dredging is used, but are generally believed to remain close to ambient levels (which are elevated at this time of year) to last from several minutes to a half an hour.

Short-term, temporary effects on fish as a result of decreases in dissolved oxygen include avoidance of the dredging area and reduced foraging during and immediately after dredging as fish avoid areas of temporarily depressed dissolved oxygen. Adult fish are expected to avoid any localized areas of significantly depressed dissolved oxygen and utilize the adjacent, non-dredged intertidal areas for refuge during operation of the dredge. The majority of the juvenile salmonid population will not be exposed to reduced dissolved oxygen conditions due to timing of dredging between October 16 and February 14, outside of their migratory period. Potential impacts due to reductions in dissolved oxygen levels as a result of dredging and disposal operations are thus expected to be highly localized and temporary.

Per Section 3.3, Conservation Measures, temporary effects on water quality and on juvenile salmonids would also be minimized by: minimizing spillage of excess sediments from the clamshell bucket, minimizing spillage of dredged sediments by not filling disposal barges beyond their capacity, minimizing entrainment of fish and disturbance of the sediment surface outside of the immediate vicinity of the hydraulic dredging operations, and by using directed discharge points and sampling of the water returned to the river following hydraulic placement of the sediments on upland sites. Compliance with all PSSDA and 401 Water Quality permit conditions would also reduce potential effects of turbidity and resuspension of anoxic sediments.

Therefore, temporary decreases in dissolved oxygen during dredging are expected to be insignificant and discountable and are not expected to result in long-term degradation of the existing water quality condition through decreased dissolved oxygen within the action area or to have adverse effects on listed species (as detailed in the 2005-2009 Biological Assessment, Corps 2003).

5.2.4 Temperature

The proposed maintenance dredging is not expected to significantly alter the depth or extent of the salt wedge within the lower Snohomish River. The resulting configuration of the bottom will not significantly change currents or flow pathways within the navigation channel from their historic condition since the 1910 authorization of maintenance dredging of the navigation channel. Dredging will remove areas of shoaled sediments and will return the settling basins and portions of the navigation channel to their authorized depths. The dredging will similarly have no effect on the distribution or density of riparian vegetation fringing (and shading) the river. Disposal operations will likewise have no effect on shading of the river, Port Gardner Bay, or Elliott Bay due to

their depth and distance from shore; thus, disposal operations will not affect the temperature of the receiving waters.

Therefore, the proposed dredging is not expected to result in a change to water temperature in the action area or to affect listed species that may be sensitive to changes in water temperature (as detailed in the 2005-2009 Biological Assessment, Corps 2003).

5.2.5 Sediment Contamination

The regular testing of sediments within the proposed dredging area ensures that any contaminated sediments are identified prior to dredging. This testing thus minimizes the potential resuspension or transport of contaminated sediments to other areas by preventing contaminated sediments from being disturbed during dredging. Sediments from the proposed dredging areas are considered to be 'low ranked' for contaminates and have been consistently suitable for both beneficial uses and open water disposal since the most recent sediment characterization in 1996. If the dredged material is used for capping the Marine Sediment Unit of the PSR Superfund site, the proposed project would reduce the exposure and uptake of sediment contaminates from that area by limiting the mobilization, resuspension, and transport of the contaminated sediments. Using the dredged material as a cap would also physically isolate the contaminated sediments from local benthic organisms (and from their associated food webs).

The Corps Dredged Material Management Office sampled sediments from the lower settling basin according to the PSSDA protocols the week of September 22, 2003; these samples were subsequently tested to determine whether the sediment continues to meet the standards for disposal at the PSSDA site, as well as the Washington State Department of Ecology's Sediment Management Standards (SMS) and Atterberg Limits for use as capping material at the PSR Superfund site. PSSDA protocol sediment suitability testing determined on January 28, 2004 that sediments from the downstream settling basin and channel are appropriate for open water disposal at the Port Gardner PSSDA site. Sediments from the upstream basin were similarly tested in March 2004. On July 7, 2004, the results of this testing determined that the sediments from the upstream settling basin and channel are also appropriate for open water disposal at the Port Gardner PSSDA site. EPA confirmed on April 27, 2004 that the sediments from the downstream basin were acceptable for use as capping material for the PSR Superfund site. EPA is in the process of confirming that sediments from the upstream basin are also suitable for use as capping material for the PSR Superfund site.

Under the Preferred Alternative, the proposed maintenance dredging is thus not expected to change the degree or nature of sediment contamination within the action area or to have an adverse effect on listed species (as detailed in the Biological Assessment, Corps 2003). By using the dredged sediments to cap the MSU of the PSR Superfund site, the Preferred Alternative would limit the mobilization, resuspension, transport, and biological accumulation of existing contaminated sediments in Elliott Bay for the benefit of the environment in the action area.

5.3 VEGETATION

No Action Alternative

Under the No Action Alternative, no immediate changes to the existing subtidal eelgrass meadow off the west shore of Jetty Island would be expected as a result of not maintaining dredging of the navigation channel and settling basins in the fiscal year 2005 through 2009 dredging cycle. If no further dredged material was deposited on Jetty Island, the extent and configuration of eelgrass in this area could change as Jetty Island erodes and near-shore sediment dynamics change in this area. Similarly, as Jetty Island erodes, there would ultimately be a loss of the existing intertidal and beach vegetation that has colonized or has been planted on and around Jetty Island.

As a result of not conducting the proposed maintenance dredging in fiscal years 2005 through 2009, gradual successional changes in subtidal and intertidal vegetation along the lower river may occur as sediments gradually accumulate within the center and edges of the navigation channel and the settling basins. It is unknown if the rate of sediment accumulation within this five year period would be sufficient to allow the expansion of the existing scattered areas of intertidal marsh along the edges of the navigation channel and settling basins. Little change in the extent of subtidal or intertidal vegetation would be expected along the edges of the downstream settling basin due to the degree of shoreline development along Port Gardner Bay. There are no subtidal or intertidal vegetation communities at either the Riverside Business Park site, the PSR Superfund site, or the PSSDA open water disposal site (due to their elevation/depths) that could be affected by not conducting the proposed maintenance dredging and disposal operations.

No change in the extent or nature of riparian, wetland, or upland vegetation would be expected as a result of not conducting the proposed dredging and disposal operations. Without placement of dredged sediments onto the Riverside site, it is likely that the dredge material cell would slowly be colonized by weedy, early successional herbaceous species typical of the surrounding area. Typical successional development of the wetland, riparian, and upland plant communities would similarly be expected under the No Action Alternative.

Preferred Alternative: Maintenance Dredging and Disposal

5.3.1 Subtidal and Intertidal Vegetation

Under the Preferred Alternative, it is unlikely that the existing subtidal eelgrass meadow of the west shore of Jetty Island would be negatively effected by the placement of dredged sediments onto the berm along the west side of Jetty Island to supplement the beach and offset erosion on the island. Hydraulic dredging by the Corps from the lower settling basin onto Jetty Island last took place between January 14 and 18, 2002. Under contract with the Port of Everett, Pentec Environmental (Pentec) monitored sediment accumulation within the eelgrass bed off the western shore of Jetty Island before and after the approximately 47,000 cubic yards of sediment was hydraulically dredged and placed on the Jetty Island berm. Pentec reported that the unconfined shoreline placement of dredged material from hydraulic dredging does not appear to have contributed to

sediment accretion in the eelgrass beds near the Island. Pentec observed no noticeable silt on the eelgrass blades and no increase in water turbidity was measured during post-placement surveys (Pentec 2003).

Dredging of the lower navigation channel and the downstream settling basin will not affect the existing extent or condition of intertidal marshes or shoreline vegetation in this area. An approximately 400-foot wide existing intertidal area would be retained along both banks of the navigation channel upstream of the downstream settling basin. This area extends between the outer edge of the dredged channel and Jetty Island to the west of the navigation channel and between the more developed shorelines of the Everett Marina, the 12th Street Channel, and the Everett Naval Station on to the east of the outer edge of the navigation channel. Similarly, approximately 100 feet of existing intertidal area would be retained along the outer-most (western) edge of the widest portion of the downstream settling basin and approximately 200 feet of existing intertidal area would be retained along the outer-most (western) edge of the narrowing portion of the downstream settling basin. Approximately 200 feet of existing intertidal area would be retained along the entire eastern edge of the downstream settling basin.

Because dredging activities are concentrated in the center of the navigation channel and settling basins that support only subtidal habitats, the proposed dredging will not directly impact any intertidal marsh areas within the lower Snohomish River. Disposal of the dredged material at the PSSDA open water site or the PSR Superfund site will similarly not affect subtidal or intertidal vegetation due to the depths of water at these sites and the consequent lack of subtidal or intertidal vegetation.

Dredging of the navigation channel and the upstream settling basin will not affect the existing extent or condition of intertidal marshes or shoreline vegetation in this area. The existing intertidal area along both banks of the upstream settling basin and navigation channel has variable widths between 50 and 150 feet wide; this area would be retained during and after dredging. By maintaining the navigatable depth of the waterway, the proposed dredging will help prevent vessels from stranding on existing intertidal marshes along the navigation channel. Vessel stranding and salvage has the potential to cause catastrophic disturbance to salt marshes.

Placement of the plastic pipeline is not expected to significantly or permanently damage the intertidal saltmarsh bench. Floating the pipeline into place and then pulling the pipeline across the bench with equipment parked in the upland is expected to minimize disruption to the marsh surface. During past placements, it was not necessary to drive or park track or rubber tire equipment on the marsh. Setting the hydraulic pipeline onto the intertidal salt marsh along the southern end of the Riverside Business Park site would temporarily cover the portion of the marsh beneath the pipeline (see Photo 4). Because the marsh vegetation will be dormant during the proposed dredging and disposal period (October 16 to February 14) and the pipeline will be in place for only three to four weeks during that time period, the impacts from this temporary placement are not expected to reduce the ability of the salt marsh to resprout in the spring following the dredging activities.

Therefore, any changes to the distribution, character, or abundance of subtidal and intertidal vegetation as a result of dredging and disposal activities are expected to be insignificant and discountable and are not expected to result in long-term degradation of these communities within the action area or to have adverse effects on listed species (as detailed in the 2005-2009 Biological Assessment, Corps 2003).

5.3.2 Wetland and Riparian Vegetation

Because dredging activities are concentrated in the center of the navigation channel and settling basins that support only subtidal habitats, the Preferred Alternative will not impact the riparian trees and shrubs which fringe portions of the lower Snohomish River.

None of the wetlands located on the Riverside site will be filled by placement of the dredged sediments within the dredge material cell on the southern portion of the site. The hydraulic pipeline will not disturb Wetlands A, B , or D as they are completely separated from the dredged material cell by the sand berm (see Photos 3 and 5). A small portion of Wetland C (the intertidal marsh) and the riparian vegetation along the shoreline will be temporarily disturbed by the placement and presence of the hydraulic pipeline (see Photo 4). However, these impacts will occur for a short period of time during the dormant season for the plants and will be confined to the immediate area under and around the pipeline. No long-term change in the species diversity, plant density, or character of these wetland and riparian areas is expected once the pipeline is removed at the end of the sediment placement into the dredged material cell.

Therefore, any changes to the distribution, character, or abundance of wetland and riparian vegetation as a result of dredging and disposal activities are expected to be insignificant and discountable and are not expected to result in long-term degradation of these communities within the action area or to have adverse effects on listed species (as detailed in the 2005-2009 Biological Assessment, Corps 2003).

5.3.3 Upland Vegetation

There will be no disturbance to upland vegetation surrounding the navigation channel of the upstream or downstream settling basins under the Preferred Alternative. There may be minor disturbance to the established upland vegetation (most of which is invasive species, particularly Scot's broom) on the Jetty Island berm during placement of dredged sediments. However, most of the sediment placement will occur in the non-vegetated areas of the berm that are the most rapidly eroding. Any disturbed areas are expected to re-vegetate naturally via colonization of dunegrass (and likely Scot's broom) from waterborne seeds and rhizomes. No disturbance is expected to upland vegetation on the southern portion of the Riverside site as the dredged material cell is completely unvegetated and the placement of the hydraulic pipeline would not impact any other portions of the site.

Therefore, any changes to the distribution, character, or abundance of upland vegetation as a result of dredging and disposal activities are expected to be insignificant and

discountable and are not expected to result in long-term degradation of upland communities within the action area or to have adverse effects on listed species (as detailed in the 2005-2009 Biological Assessment, Corps 2003).

5.4 AQUATIC INVERTEBRATES AND FISH

No Action Alternative

Due to the absence of maintenance dredging and disposal in fiscal years 2005 through 2009, the benthic and epibenthic invertebrate community within the channel, settling basins, and disposal sites would not be expected to change. Invertebrate prey for juvenile salmonids and forage fish would not be temporarily reduced by removal, smothering, or reduced organic carbon (reduced food supply); there would likely be gradual natural adjustments in species diversity and density as the invertebrate community adjusts to the accumulation of shoaled sediments within the settling basins and navigation channel. Under the No Action Alternative, there would be no risk of anadromous salmonids or forage fish becoming entrained during dredging and there would be no temporary effects of increases in noise, turbidity, and water column disturbance on fish migration or foraging.

Preferred Alternative: Maintenance Dredging and Disposal

5.4.1 Aquatic Invertebrates

Dredging will temporarily reduce the populations of the benthic and epibenthic invertebrates through removal of the benthic substrate and smothering as suspended sediments settle out of the water column. Invertebrate prey for juvenile salmonids and bottom fish will thus be temporarily reduced along the center-line of the dredged portions of the navigation channel and within the upstream and downstream settling basins. Total organic carbon could be slightly lower in the newly exposed sediments after dredging. Thus, the amount of food (in the form of organic matter) available for benthic invertebrates in these areas would be slightly reduced on a temporary basis.

While benthic and epibenthic prey species will be temporarily displaced, populations are expected to recover shortly (within one year) after dredging activities are completed. Because the dredging will occur only in a portion of the navigation channel and within the settling basins, adjacent undisturbed intertidal habitat along the edges of the dredged areas will continue to provide an established source of benthic and epibenthic invertebrates to colonize the newly disturbed subtidal substrate. Since new invertebrate communities will recolonize the dredging area, no long-term loss of biological productivity or prey base for juvenile salmonids or bottom fish is expected.

Disposal of the dredged sediments will also eliminate deeper subtidal invertebrate communities at the PSR Superfund site and PSSDA open water disposal site by smothering them. However, as with shallower benthic and epibenthic invertebrates within the navigation channel, recolonization from adjacent areas is expected within a relatively short time frame (two to three years). Romberg et al. (1995), studying a

subtidal sand cap placed to isolate contaminated sediments in Elliott Bay, identified 139 species of invertebrates five months after placement of the cap. The benthic community reached its peak population and biomass approximately two and one-half years after placement of the cap, and then decreased, while the number of species increased to 200 as long-lived species recruited to the population (Wilson and Romberg 1996).

If the dredged sediments are used to cap the contaminated sediments of the Marine Sediment Unit at the PSR Superfund site, the benthic invertebrate community in that area is expected to ultimately be restored and possibly improved through creation of cleaner benthic habitat. Thus, higher invertebrate diversity and abundance are expected in this area once exposure to contaminated sediments is reduced or eliminated through capping.

Therefore, although there will be temporary decreases in benthic and epibenthic prey within the dredging and disposal areas, this decrease is expected to cause an insignificant and discountable effect on local invertebrate populations in the action area and are not expected have adverse effects on listed fish species or adverse food web effects (as detailed in the 2005-2009 Biological Assessment, Corps 2003).

5.4.2 Anadromous Salmonids

Under the Preferred Alternative, both a hydraulic pipeline dredge and a clamshell dredge would be used to remove sediments from the settling basins and navigation channel. It is generally accepted that clamshell buckets do not have the potential to entrain fish because the bucket is totally open during its descent and thus cannot trap or contain a mobile organism during its descent through the water column.

Due to the recognized potential for hydraulic dredges to entrain fish, the hydraulic dredge has been studied extensively. Typically, hydraulic dredges have been found to entrain few or no salmonids or other mobile fishes (McGraw and Armstrong 1988, Larson and Moehl 1988, Larson and Cassidy 1990, Kyte and Houghton 1994 [unpublished data], Reine et al. 1998). Based on the operation of the clamshell dredge bucket, and the ability of salmonids and other mobile fishes to avoid entrainment in hydraulic dredges, the proposed dredging is not likely to entrain juvenile or adult salmonids, or other mobile fishes.

Temporary increases in noise, turbidity, and water column disturbance during dredging is expected to signal adult fish to avoid the area during dredging activities. Because dredging is confined to the center of the navigation channel, adults can readily avoid the disturbed portion of the water column by moving toward the shoreline and either holding or transiting around the area being dredged. Therefore, the proposed dredging is not likely to adversely affect adult salmonids even if their upstream migration overlaps the dredging period. The proposed dredging and disposal activities have been timed so that few juvenile salmonids are expected to migrate through the waterway or to use the adjacent shoreline habitats during the dredging period. If any early migrants are moving through the area during dredging activities, they are likely to remain near the shoreline, thereby avoiding disturbances associated with dredging in the main navigation channel.

Therefore, although there will be temporary increases in noise and disturbance, coupled with temporary decreases in water quality surrounding the dredging and disposal operations, these are expected to be insignificant and discountable effects on local fish populations in the action area and are not expected have adverse effects on listed fish species (see Section 5.5 for more details on federally listed fish species, and the 2005-2009 Biological Assessment, Corps 2003).

5.4.3 Forage Fish

Temporary effects on the forage fish community are possible during dredging and disposal activities. Forage fish such as Pacific herring and surf smelt are expected to detect dredging noises and turbidity and to avoid the dredging area, resulting in the temporary dispersion of forage fish from the immediate area during the dredging period. Sandlance could be entrained in the sediment 'bites' of the clamshell bucket or by the suction action of the hydraulic dredge during daytime dredging, but they are unlikely to be affected by dredge 'bites' that occur at night since these fish diurnally burrow into higher elevation beaches at night.

Dredging and disposal activities are not expected to affect the spawning of Pacific herring, surf smelt, or sand lance because there is no appropriate spawning habitat within the vicinity of the dredging or disposal activities. Forage fish are expected to immediately return to their usual foraging areas and behaviors after dredging and disposal activities stop.

Therefore, although there will be temporary disturbances to local forage fish populations, coupled with temporary decreases in water quality surrounding the dredging and disposal operations, these effects are expected to be insignificant and discountable. Thus, dredging operations are not expected have adverse effects on listed fish species through foodweb interactions (as detailed in the 2005-2009 Biological Assessment, Corps 2003).

5.5 WILDLIFE

No Action Alternative

In the absence of the fiscal years 2005 through 2009 round of maintenance dredging and disposal, no changes to the diversity, density, or behavior of local birds, terrestrial mammals, and/or marine mammals within the action area would be expected. Resident and migratory birds and mammals would not be temporarily affected by increases in noise, turbidity, and water column disturbance during operation of the dredges in the channel and settling basins or by the release of the dredged sediments at the Riverside Business Park site, the PSR Superfund site, or the PSSDA open water disposal site. No temporary effects to fish populations would occur, and thus no temporary effects on foraging efforts by birds and marine mammals around the dredging and disposal operations.

Preferred Alternative: Maintenance Dredging and Disposal

5.5.1 Birds

Resident populations of bald eagle, osprey, peregrine falcon, great blue heron, purple martin, and the variety of songbirds, shorebirds, and waterfowl that utilize the lower Snohomish River are believed to be acclimated to the highly urbanized area surrounding the downstream settling basin and navigation channel. Resident individuals wintering along the shore or within areas of saltmarsh may avoid the center of the navigation channel during dredging, but this behavioral effect is expected to be temporary. Resident waterfowl and seabirds resting or foraging in Port Gardner Bay and Elliott Bay are also expected to avoid the immediate area of the disposal activities while the barges are being emptied at the PSSDA site or the PSR Superfund site. Resident birds are expected to immediately return to their usual foraging areas and behaviors after the dredging stops and thus the proposed action is not expected to reduce the foraging prey base for resident or migrating raptors such as peregrine falcons, gyrfalcons, and bald eagles (see Section 5.6.1 for more details on bald eagles). Seagulls and other more aggressive birds that regularly utilize the lower Snohomish River, such as crows and possibly osprey, may be attracted to the dredging area by any fish that are temporarily disoriented while avoiding the dredge.

The proposed dredging and disposal activities are thus expected to have insignificant and discountable effects on resident and migratory birds in the action area and are not expected have adverse effects on listed bird species (as detailed in Section 5.6 below and as detailed in the 2005-2009 Biological Assessment, Corps 2003).

5.5.2 Marine Mammals

Resident populations of harbor seals, Dall's porpoise, Pacific harbor porpoise, orca whales, and California sea lions that utilize the lower Snohomish River, Possession Sound, and Elliott Bay are believed to be acclimated to the levels of human activity and disturbance in these highly urbanized areas. During disposal of dredged sediments in Possession Sound (at the PSSDA site) and in Elliott Bay (at the PSR Superfund site), the foraging activities of these marine mammal species may be temporarily affected by reduced visibility in the water column and by any temporary disorientation of fish around the disposal locations. Harbor seals foraging within the lower river channel and settling basins are expected to avoid the immediate area of the dredging operation. California sea lions hauled out or foraging around the log booms in Port Gardner Bay or on navigation buoys around the PSR Superfund site might also be expected to temporarily move out of the immediate area during disposal operations, depending on the proximity of the disposal barge to their haul-out or foraging locations. However, all of these species are expected to return to their usual foraging and resting areas and typical behaviors shortly after dredging and disposal activities are completed or move out of their immediate vicinity.

The proposed dredging and disposal activities are thus expected to have insignificant and discountable effects on resident and migratory marine mammals in the action area and are not expected have adverse effects on listed marine mammal species (as detailed in Section 5.6 below and as detailed in the 2005-2009 Biological Assessment, Corps 2003).

5.5.3 Terrestrial Species

Resident terrestrial mammals such as beaver, river otter, muskrat, deer, rabbit, coyote, raccoon, and small rodents, as well as red-legged frogs, Pacific chorus frogs, rough skinned newt, and garter snakes may be temporarily disturbed during dredging operations. Animals foraging along the shoreline and riparian areas could be flushed from the immediate shoreline area during dredging. Animals within the immediate vicinity of the dredge material disposal area of the Riverside Business Park site would also likely temporarily leave the area during placement of the dredged sediments onto the site.

However, all of these species are expected to immediately return to their usual foraging and resting areas and typical behaviors after the dredging and disposal activities stop or move out of their immediate vicinity. As there are no terrestrial areas at the PSR Superfund site or the PSSDA open water disposal site, the proposed disposal activities in these areas will have no effect on terrestrial species. The proposed dredging and disposal activities are thus expected to have insignificant and discountable effects on resident terrestrial species in the action area.

5.6 THREATENED AND ENDANGERED SPECIES

No Action Alternative

Under the No Action Alternative, there would be no dredging of the settling basins or navigation channel in the lower Snohomish River or beneficial use of dredged sediments at the Riverside Business Park site, the PSR Superfund site, or disposal at the PSSDA open water site that could affect threatened or endangered species utilizing habitats in these areas. The food web interactions between benthic invertebrates, Puget Sound Chinook salmon, Coastal/Puget Sound bull trout, and fish-eating birds such as the bald eagle and marbled murrelet would continue without any temporary disruptions to foraging behavior during dredging and disposal operations. Under the No Action Alternative, there could be no risk of Puget Sound chinook or Coastal/Puget Sound bull trout becoming entrained during dredging and there would be no temporary effects of increases in noise, turbidity, and water column disturbance on fish migration or foraging. Under the No Action Alternative, resident and migratory bald eagles, marbled murrelets, and Steller sea lions could not be temporarily affected by increases in noise, turbidity, and water column disturbance during operation of the dredges or by the release of the dredged sediments at the Riverside Business Park site, the PSR Superfund site, or the PSSDA open water disposal site.

Preferred Alternative: Maintenance Dredging and Disposal

Potential impacts of the proposed projects on threatened and endangered species are addressed in a separate Biological Assessment (BA) dated September 29, 2003. That BA was amended on November 13, 2003 to accommodate a schedule change to the proposed dredging dates of FY 2005 through 2009. The BA was subsequently also amended on May 28, 2004 to include recently confirmed details regarding beneficial use of the

Riverside Business Park site for disposal of sediments dredged from the upstream settling basin and channel.

The BA provides the Corps' rationale for the effect determinations as summarized in Table 2 and briefly described below. The USFWS concurred with the determination of "may affect, but not likely to adversely affect" for the bald eagle, marbled murrelet, and bull trout for FY 2005 only, via a concurrence letter dated December 16, 2003 and a subsequent email dated July 22, 2004 in response to the inclusion of the Riverside site as a disposal location (Appendix B). Similarly, NOAA Fisheries concurred with the determination of "may affect, but not likely to adversely affect" for Puget Sound chinook salmon and Steller sea lion via a concurrence letter dated December 15, 2003 and a subsequent email also dated July 22, 2004 in response to the inclusion of the Riverside site as a disposal location (Appendix B). Copies of the Biological Assessment and amendments are available from the Corps upon request.

Table 2. Effect determinations from the 2005-2009 Biological Assessment

Common Name	***Scientific Name***	***Effect on Listed Species***	***Effect on Designated Critical Habitat***
Bald Eagle	*Haliaeetus leucocephalus*	May affect, but is **not likely to adversely affect**	No critical habitat is designated
Marbled Murrelet	*Brachyramphus marmoratus*	May affect, but is **not likely to adversely affect**	**No effect** on designated critical habitat
Steller Sea Lion	*Eumetopias jubatus*	May affect, but is **not likely to adversely affect**	No critical habitat is designated
Puget Sound/Coastal Bull Trout	*Salvelinus confluentus*	May affect, but is **not likely to adversely affect**	No critical habitat is designated
Puget Sound Chinook Salmon	*Oncorhynchus tshawytscha*	May affect, but is **not likely to adversely affect**	May affect, but is **not likely to adversely affect**

5.6.1 Bald Eagle, Marbled Murrelet, and Steller Sea Lion

Potential effects of the proposed maintenance dredging on bald eagles, marbled murrelets, and Steller sea lions include disturbance from the dredging and disposal activities and increased turbidity around the navigation channel and the settling basins during dredging that may inhibit foraging or result in temporarily reduced food availability. Noise (running heavy equipment) and temporary increases in turbidity during dredging and disposal will likely cause prey fish and waterfowl to avoid the immediate area of the dredging and disposal operations. Consequently, resident or wintering bald eagles, or the unlikely marbled murrelet or Steller sea lion would be

expected to temporarily avoid the immediate area and forage elsewhere until dredging operations are completed.

Because the action area represents a small portion of the foraging habitat locally available for bald eagles, marbled murrelets, and Steller sea lions along the shoreline of central Puget Sound, any such interference with foraging activity is expected to be insignificant and discountable, ending when the dredging and disposal activities are completed. Similarly, because resident and wintering populations in this area are likely acclimated to frequent boat traffic on the lower Snohomish River, Port Gardner Bay, Possession Sound, and Elliott Bay, no long-term effects on habitat suitability or foraging behavior are expected. This disturbance would not be expected to significantly disrupt normal behavior patterns sufficiently to create the likelihood of injury or 'take' of any bald eagles, marbled murrelet, or Steller sea lions. Therefore, the potential for incidental take in any form (including harassment) is considered negligible. Noise and activity levels during the dredging and disposal activities are expected to be within the range of recurrent ambient levels within these industrialized areas.

Although dredging and disposal activities could take place during early portion of the bald eagle nesting season (January through February 14), survival and reproductive success of bald eagles at the nests closest to the dredging areas will be unaffected due to their distance from the dredging areas (all greater than two miles) and the disposal areas (all between one and two miles). Nesting bald eagles in these areas have repeatedly nested and fledged young from these highly industrialized and frequently disturbed shorelines. Thus, these birds are likely fairly acclimated to the passage of dredges and barges, and to frequent, temporary increases in noise levels. Similarly, bald eagles on Gedney Island and Duwamish Head are also unlikely to be disturbed by the slow transit of the bottom-dump barge to the disposal site and the release of sediment into the water column during dumping.

In the unlikely event that Steller sea lions were hauled out on the docks near the downstream settling basin, any temporary disturbance with their activities will end when the dredging is completed. Survival and reproductive success of marbled murrelets and Steller sea lions will be unaffected due to the lack of appropriate nesting/breeding rookery habitat within the action area.

Long-term degradation of bald eagle, marbled murrelet, and Steller sea lion habitat is also not expected. Cumulative effects would be minimized by avoiding disruptions of the local prey base through appropriate timing of work windows. Minimal effects are expected because the dredging window is timed to avoid periods of juvenile salmonid use in the estuary. Use of dredged material to contain contaminated sediments within the Marine Sediment Unit may ultimately limit the possible exposure of foraging bald eagles, marbled murrelets, and Steller sea lions to bioaccumulated toxins in their food web.

Therefore, the proposed dredging and disposal activities are expected to have insignificant and discountable effects on bald eagles, marbled murrelets, and Steller sea

lions in the action area and are not expected have adverse effects on these species (as detailed in the 2005-2009 Biological Assessment, Corps 2003).

5.6.2 Puget Sound/Coastal Bull Trout and Puget Sound Chinook Salmon

Potential effects of the proposed maintenance dredging on bull trout and chinook salmon include disturbance from the dredging and disposal activities and increased turbidity during dredging that may inhibit foraging or result in temporarily reduced food availability. Noise (running heavy equipment) and temporary increases in turbidity during dredging and disposal will likely cause these fish to avoid the immediate area of the dredging and disposal operations and forage elsewhere until dredging operations are completed.

It is unlikely that either juvenile or adult bull trout would occur in the settling basins or adjacent portions of the navigation channel their during the proposed dredging period (October 16 to February 14) based on the lack of out-migrating juvenile salmonids to prey upon and on the migratory behavior of bull trout observed in the Corps' recently completed telemetry study. Except for brief periods of movement in response to rainfall/high flow events, the telemetry study indicates bull trout are not present within the lower Snohomish River during the period of the proposed dredging.

The occurrence of large numbers of adult chinook migrating through the action area during the dredging period (October 16 to February 14) is also unlikely based on the timing of adult upstream migration (July through September) and spawning (September and October). Any late migrating adult chinook within the lower Snohomish River during the period of dredging operations are likely to avoid the dredge and its zone of temporarily increased turbidity.

The temporary loss of the benthic and forage fish communities in the dredging areas would have only a temporary and negligible effect on foraging habitat, especially since juvenile bull trout and chinook forage mainly outside of the navigation channel. Populations of prey important to bull trout and chinook salmon (juvenile salmon and forage fish) are unlikely to be affected by the proposed dredging and disposal operations (see Sections 5.4.2 and 5.4.3).

In the event that an occasional bull trout or chinook salmon would be migrating through the dredging areas in response to rainfall events, they would be expected to readily avoid the project area during dredging operations by utilizing shallow intertidal areas along either side of the navigation channel and settling basins. Foraging habitat, such as these shallow intertidal areas, would not be affected by the dredging.

Similarly, bull trout or chinook salmon within the vicinity of the disposal sites (either the PSR Superfund site in Elliott Bay or the PSSDA site in Port Gardner Bay) would be expected to move out of the area of the bottom dump barge as sediments are falling through the water column; bull trout and chinook salmon would not be expected to be in the deeper waters where the sediments would settle. Use of the dredged material to

contain the contaminated sediments at within the Marine Sediment Unit may ultimately limit the possible exposure of these fish to bioaccumulated toxins in their food web.

Conservation Measures (as described in Section 3.3) and Water Quality Certification conditions, including avoiding dredging during the migration period of juvenile salmonids, would greatly reduce adverse short-term effects on bull trout and chinook salmon populations during dredging operations and reduce the potential for incidental take in the form of harm or harassment of to a negligible level. Overall, these effects are all temporary and localized. They are limited in time to periods outside the migration period for juvenile salmonids and are limited in space to the immediate vicinity of dredging activities. The effects of the proposed action are thus expected to be insignificant and discountable due to the temporary duration of the dredging activities and the implementation of proposed conservation measures to minimize the potential of bull trout and chinook salmon being within the action area during dredging.

Therefore, proposed dredging and disposal activities are expected to have insignificant and discountable effects on Coastal/Puget Sound bull trout and Puget Sound chinook salmon in the action area and are not expected have adverse effects on these species (as detailed in the 2005-2009 Biological Assessment, Corps 2003)

5.7 CULTURAL RESOURCES AND NATIVE AMERICAN CONCERNS

No Action Alternative
Under the No Action Alternative, there would be no dredging of the settling basins or navigation channel in the lower Snohomish River or beneficial use of dredged sediments at the Riverside Business Park site, the PSR Superfund site, or disposal at the PSSDA open water site that could affect cultural resources within the action area. Similarly, unrecorded historic properties in the action area would not be affected.

Preferred Alternative: Maintenance Dredging and Disposal
No impacts to cultural resources are anticipated from implementation of the proposed maintenance dredging and disposal operations due to a lack of cultural resources within the navigation channel, settling basin, or at the disposal sites. Previously conducted archeological surveys by Corps archeologists have been coordinated with the local Native American Tribes and the State Historic Preservation Officer. However, if any cultural resources are encountered during dredging or disposal activities, all work will cease and the State Historic Preservation Officer and local Native American Tribes will be notified. Therefore, the proposed dredging and disposal operations are not expected to result in long-term degradation of cultural resources within the action area. Coordination with the Tulalip Tribe will ensure no conflict between the proposed dredging and disposal activities and the usual and accustomed fishing activities of the Tribe.

5.8 LAND USE

No Action Alternative
If the proposed fiscal year 2005 through 2009 dredging were not conducted, there would likely be no change in the waterway severe enough to affect local land use along the lower Snohomish River, Port Gardner, or within Elliott Bay. Problems for marine traffic caused by current shoaling would worsen as the shoaling continues. The settling basins would remain full and any additional material would shoal in these areas and also move further down stream and shoal within the navigation channel. Increased shoaling would further reduce the ability of vessels to enter and leave safely under full load. However, land use in the area would continue to be heavily industrialized and to support a variety of water-related commercial and industrial land uses.

However, if dredging were suspended indefinitely, shoaling sediments could result in changes to local land use patterns. If water-dependent industries and commercial operations were unable to utilize the navigation channel and marina or to safely navigate the lower Snohomish River and Port Gardner, these types of land uses could become more limited in the action area as these types of activities seek more navigable ports elsewhere in Puget Sound.

Preferred Alternative: Maintenance Dredging and Disposal
Under the Preferred Alternative, there would be no change in local land use patterns as a result of the proposed dredging and disposal operations. The local marinas, yacht clubs, Naval Station, and port facilities would continue to utilize the navigation channel and Port Gardner. The general level of noise and disturbance associated with dredging and disposal operations is consistent with the urbanized and industrial land uses of the areas surrounding the navigation channel, settling basins, and disposal locations.

It is unlikely there would be any direct increase in local development due to the maintenance dredging of the settling basins and navigation channel or due to disposal of the sediments at the PSR Superfund site, Jetty Island, or the PSSDA open water disposal site. Once deposited onto Jetty Island, the dredged sediments would help to maintain recreational and ecological values of the island, but would likely not cause a change in use of the island. Once deposited onto the Riverside Business Park site, the dredged sediment would be rehandled and used for development of other Port of Everett sites in the region, however there is currently no specific destination designated for the rehandled sediments.

Therefore, any changes to local land use as a result of dredging and disposal activities are expected to be insignificant and discountable and are not expected to result in long-term land use change or to have adverse effects on land use within the action area.

5.9 RECREATIONAL USE

No Action Alternative

Under the No Action Alternative, there would be no change that would affect local recreation within the lower Snohomish River, Port Gardner, or Elliott Bay. The Snohomish River and Port Gardner would continue to support heavy industrial, commercial, and recreational vessel use. However, without an additional supply of dredged sediments, the recreational value of Jetty Island could decrease over time as the island and its habitats erode.

Preferred Alternative: Maintenance Dredging and Disposal
Under the Preferred Alternative, recreational use of the lower Snohomish River channel and Jetty Island would be maintained. Recreational boaters and hand-launch vessels would continue to be able to use the navigation channel to access the lower river and associated habitats. The recreational value of Jetty Island would be maintained by beneficial use of dredged sediments, but no new areas of recreational interest would be created on the island. There would be no change to recreational use of Elliott Bay or the Riverside Business Park site as a result of the proposed dredging and disposal activities.

Therefore, any changes to recreational use of the area as a result of dredging and disposal activities are expected to be insignificant and discountable and are not expected to result in long-term degradation or adverse effects on recreational opportunities within the action area.

5.10 AIR QUALITY AND NOISE

No Action Alternative
Under the No Action Alternative, there would be no change to the site that would affect local air quality or noise levels along the lower Snohomish River, Port Gardner, or Elliott Bay. The area would continue to be heavily industrialized with the incumbent air quality and noise issues associated with industrial traffic and processes. The Snohomish River would continue to support heavy industrial, commercial, and recreational vessel use with the associated levels of air pollution and noise generated.

Preferred Alternative: Maintenance Dredging and Disposal
Under the Preferred Alternative, there would be a temporary and localized reduction in air quality due to emissions from equipment operation during dredging and disposal of the sediment. Increases in noise would occur, and would also be temporary and localized during dredging and would cease once dredging operations were concluded.

Due to their temporary and localized nature, any changes to air quality or noise levels within the action area as a result of dredging and disposal activities are expected to be insignificant and discountable. The Preferred Alternative is not expected to result in long-term degradation of air quality or noise levels within the action area or to have adverse effects on listed species (as detailed in the 2005-2009 Biological Assessment, Corps 2003).

5.11 TRANSPORTATION AND NAVIGATION

No Action Alternative
Under the No Action Alternative, there would be no change to the settling basins or navigation channel that would affect local transportation routes or volumes along the Snohomish River. Traffic would continue to occur primarily along Marine View Drive, the Marina Village, Everett Yacht Club, Marine Park and the Everett Naval Station. If dredging were not conducted over the fiscal year 2005 through 2009 time period, the build up of shoals within the navigation channel and settling basins could ultimately limit the ability of vessels to safely navigate the lower river.

Preferred Alternative: Maintenance Dredging and Disposal
There is potential for some disruption of local vessel traffic during the mobilization and de-mobilization of the dredges and barges under the Preferred Alternative. However, these disruptions would be temporary and only affect vessels in the immediate vicinity of the dredging and disposal operations. Ultimately, by removing shoaling sediments from the navigation channel and settling basins, the ability of vessels to safely navigate the lower river would be maintained. There would be little disruption to vehicular traffic on local roads due to the aquatic nature of the vessels used during dredging and disposal. Large dump trucks would carry the dredged material once it is rehandled at the Riverside or other upland sites and would transport the sediment to its ultimate destination over local roads.

Due to their temporary and localized nature, any changes to transportation or navigation patterns within the action area as a result of dredging and disposal activities are expected to be insignificant and discountable. The Preferred Alternative is not expected to result in long-term degradation of transportation or navigation capabilities within the action area.

5.12 AESTHETICS

No Action Alternative
Under the No Action Alternative, there would be no change to the site that would affect local aesthetics along the Snohomish River. The area would continue to be heavily industrialized with few areas of native habitat providing visual interest, particularly along the river channel above the upstream settling basin. No change would be expected to Jetty Island. The upstream and downstream portions of the river would continue to provide bird and wildlife watching opportunities.

Preferred Alternative: Maintenance Dredging and Disposal
There is potential for some disruption of aesthetic resources during the mobilization and de-mobilization of the dredges and barges under the Preferred Alternative. However, these disruptions would be temporary and only affect only the immediate vicinity of the dredging and disposal operations. There would be a temporary disruption to local bird

and wildlife watching as a result of the dredging and disposal activities, but the disruption would cease once dredging and disposal operations were concluded.

Due to their temporary and localized nature, any changes to aesthetic opportunities within the action area as a result of dredging and disposal activities are expected to be insignificant and discountable. The Preferred Alternative is not expected to result in long-term degradation of aesthetic opportunities within the action area.

6. UNAVOIDABLE ADVERSE EFFECTS

Unavoidable adverse effects of the proposed projects include: 1) the disruption of local and tourist boat traffic by the dredging and disposal vessels; (2) noise disturbance to fish, wildlife, and recreational users in the vicinity of the dredging and disposal vessels and the hydraulic pipeline; (3) mortality of sessile and mobile benthic and epibenthic fish and invertebrates within the sediments during dredging of the settling basins and navigation channel and during disposal at the PSSDA and PSR Superfund sites; and (4) disturbance by the hydraulic pipeline to a portion of the intertidal marsh and riparian zone fringing the Riverside site. Given the temporary, localized, and discountable nature of these effects, they are not considered significant.

7. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The proposed maintenance dredging and disposal project would not entail any significant irretrievable or irreversible commitments of resources. Dredging and disposal work would require use of existing machinery and use of existing, licensed and permitted disposal sites.

8. CUMULATIVE IMPACTS

Cumulative impacts result from the "individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.7). NEPA requires the evaluation of cumulative impacts of the proposed dredging and disposal operations in light of past, current, and reasonably foreseeable future actions within the lower Snohomish River. Actions with the highest potential for cumulative impacts in this area are continuation of commercial and recreational vessels utilizing the lower Snohomish River via the navigation channel, coupled with repeated dredging of the navigation channel and settling basins, and disposal of dredged material generated by dredging operations.

The human community is positively affected by past, present, and future dredging actions through the safeguarding of navigation within the River and the continuation of commercial and recreational vessel use of the lower river. All dredging in the lower river removes shoaled sediments that would otherwise hinder safe navigation downstream within the Everett Marina and at adjacent industrial, commercial, and recreational piers. By removing potentially hazardous areas of shoaling and by maintaining the authorized depth of the navigation channel, the cumulative effects of dredging support the present and future economic and recreational use of the area. These cumulative effects are not expected to increase due to the proposed maintenance dredging; rather they are a continuation of the current type and intensity of human use of the lower Snohomish River and its adjacent lands.

However, the repetition of dredging actions over time has degraded the biological function of the navigation channel and settling basins from its historic condition. In combination with the extensive diking and draining of adjacent lands within the floodplain, the deepening of the main channel of the river has disconnected the river from its floodplain. This has limited the formation of habitats associated with intertidal salt marshes and large woody debris, and supported urban land uses along the river's edge by increasing the conveyance of floodwaters and sediment downstream and off of adjacent lands. The 1975 EIS covering maintenance of the Everett Harbor and Snohomish River described the loss of intertidal areas by the creation of Jetty Island from dredged sediments (Corps 1975).

The cumulative effects of maintenance dredging projects on federally listed species as a measure of the capability of the river system to support imperiled species are expected to be minimal. Minimal effects on bull trout, Puget Sound chinook salmon, Steller sea lions, bald eagles, and marbled murrelets are expected because the dredging and disposal would occur within the fish window of October 16 to February 14, and so would largely avoid effects on juvenile salmonids. Cumulative effects would also be minimized on bald eagles, marbled murrelets, and Steller sea lions by avoiding disturbance in and around local nests or haul out areas and by avoiding disruptions of the local prey base through appropriate timing of work windows.

The incremental harm to the biological function of the river is offset to some degree by the beneficial use of the dredged sediments, rather than mere disposal at designated open water sites in the marine environment. Beneficial use of the dredged sediments at the Riverside Business Park site, the PSR Superfund site, and Jetty Island reduces impacts to marine areas due to disposal of the dredged sediments (particularly the benthic communities). Positive changes associated with the project activities include isolation of contaminated sediments at the PSR Superfund site from the benthic and aquatic food web and maintenance and counteracting erosion and loss of valuable recreational areas and wildlife habitats at Jetty Island.

Other projects with the greatest potential to have cumulative effects with the proposed maintenance dredging are other periodic maintenance dredging of the boat basin and/or 12th Street Marina by the Port of Everett and subsequent disposal actions. Negative effects of proposed maintenance dredging and disposal add to the cumulative negative effects of previous dredging by the Corps and by other entities such as the Port of Everett. Dredging conducted by other entities is generally occurs less frequently than the proposed Corps maintenance dredging, but affects the same types of environments within the lower river. Dredging by the Port of Everett occurs every few years or longer; dredging of the 12th Street Marina is estimated to occur in calendar year 2005 and to encompass approximately 300,000 cubic yards of material. The effects of such dredging projects on the physical parameters of the lower Snohomish River are expected to be similar to those of those effects described previously in this EA, including temporary water quality effects, effects on the benthic community, and temporary displacement of fish and wildlife from the immediate area of dredging and disposal activities.

The combination of mitigation measures to reduce negative effects reduces the cumulative, short-term impacts of this project (and likely other similar maintenance dredging projects conducted by other entities) to an insignificant level. These measures include: project timing to reduce impacts to salmonids and associated food web effects, BMPs during dredging and disposal to minimize water quality effects, and monitoring of water quality conditions during dredging and return of water to the river (as at the Riverside site). In the context of past dredging activities and the general degree of industrialization of the floodplain lands along the lower river, the current rounds of maintenance dredging will cause only a small incremental impact to biological functions and floodplain connectivity. The impacts would likely be so small as to be immeasurable. The Corps therefore concluded there will be no significant contribution to present or future cumulative effects associated with the proposed maintenance dredging and disposal actions.

9. ENVIRONMENTAL COMPLIANCE

Table 3. Summary of Environmental Compliance

LAWS AND REGULATIONS RELATING TO THE PROPOSED ALTERNATIVES	ISSUES ADDRESSED	CONSISTENCY OF PREFERRED ALTERNATIVE
National Environmental Policy Act (NEPA) 42 U.S.C. 4321 et seq.	Requires all federal agencies to consider the environmental effects of their actions and to seek to minimize negative impacts	Consistent per FONSI and EA document
State Environmental Policy Act (SEPA) RCW 43.21	Requires state agencies to consider the environmental effects of their actions and actions of permit applicants.	Consistent
Clean Water Act (CWA) 33 U.S.C. 1251 et seq.; Section 404	Requires federal agencies to protect waters of the United States. Disallows the placement of dredged or fill material into waters (and excavation) unless it can be demonstrated there are no reasonable alternatives.	Consistent per 404(b)(1) Evaluation; see Appendix A
Clean Water Act Section 401	Requires federal agencies to comply with state water quality standards.	Consistent with 401 permit requirements as issued by Washington Department of Ecology; see Appendix A
Fish and Wildlife Coordination Act 16 U.S.C. 661 et seq.	Requires federal agencies to consult with the US Fish & Wildlife Service on any activity that could affect fish or wildlife.	Not required for maintenance activities
Endangered Species Act 16 U.S.C. 1531 et seq.;	Requires federal agencies to protect listed species and consult with USFWS or NMFS regarding the proposed action.	Consistent based on concurrence of USFWS and NOAA Fisheries with Biological Assessment, see Appendix A.
National Historic Preservation Act 16 U.S.C. 461;	Requires federal agencies to identify and protect cultural and historic resources.	Consistent based on SHPO determination of no effect
Shoreline Management Act (SMA) and Shoreline Management Program (SMP) RCW 90.58, WAC 173-14	State law implementing the Coastal Zone Mgmt Act requiring local jurisdictions to plan and protect shorelines.	Consistent
Coastal Zone Management Act (CZMA) 16 U.S.C. 1451 et seq.; 15 CFR 923	Requires federal agencies to comply with state and local plans to protect and enhance coastal zone and shorelines.	Consistent to the maximum extent practicable
Washington Hydraulic Code	Requires proponents of developments, etc to protect state waters, wetlands and fish life.	Will be consistent with HPA conditions issued by WDFW to local sponsor (Port of Everett)
Executive Order 11988: Floodplain Management Guidelines	Requires federal agencies to evaluate the potential effects of actions on floodplains and to avoid undertaking actions that directly or indirectly induce growth in the floodplain or adversely effect natural floodplain values	Consistent, project will not induce growth in floodplain or affect natural floodplain values compared to existing conditions
Executive Order 11990: Protection of Wetlands	Encourages federal agencies to take actions to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands when undertaking federal activities and programs	Consistent, no destruction, loss, or long-term degradation of wetlands as a result of the maintenance dredging or disposal
Executive Order 12898: Environmental Justice	Requires federal agencies to consider and address environmental justice by identifying and assessing whether agency actions may have disproportionately high and adverse human health or environmental effects on minority or low-income populations	Consistent due to lack of adverse human health or environmental effects on minority or low-income populations in local area

10. CONCLUSION

Based on this Environmental Assessment and on coordination with Federal agencies, Native American Tribes, and State agencies, this project is not a major Federal action significantly affecting the quality of the human environment, and therefore does not require preparation of an environmental impact statement.

11. PUBLIC REVIEW AND COMMENTS

No comments were received on the draft Environmental Assessment, which was available for public comment from May 11, 2004 to June 10, 2004. One comment was received in response to the Public Notice CENWS OD-TS-NS-22, which was available for public comment from April 14, 2004 through May 7, 2004.

11.1 COMMENT

The following comment was received on May 7, 2004 via email from Ms. Candice Soine of Snohomish County Public Works, Transportation & Environmental Services:

"Snohomish County Public Works staff has reviewed the submitted documents and recommends that all disposal sites be identified before environmental review is complete and there is a final disposition of this permit."

11.2 RESPONSE

For the fiscal years 2005 through 2009 period described in the EA and Public Notice, the Corps has identified permitted and previously used disposal sites at the PSSDA open water site in Port Gardner Bay, the PSR Superfund site in Elliott Bay, Jetty Island, and the Riverside Business Park site, as described in Section 3.2 of this EA.

As noted in Section 3.2.5 of this EA, the Corps would prepare an addendum to this EA and would reinitiate detailed consultation with USFWS and NOAA Fisheries to evaluate specific effects of potential use of any other sites not currently permitted for sediment disposal.

12. LITERATURE CITED

Calambokidas, J. 1991. Marine Mammal Specialist, Cascadia Research Collective, Olympia, WA. Personnal communication with R. Sturim, Roy F. Weston, Inc. 29, January.

City of Everett. 1997. Snohomish Estuary Wetland Integration Plan. City of Everett, Department of Planning and Community Development. April 1997.

Haas, A. and B. Collins. 2001. A historical analysis of habitat alterations in the Snohomish River valley, Washington, Since the mid-19th century: Implications for Chinook and Coho salmon. Report prepared for the Snohomish County Department of Public Works, Surface Water Management Division and the Tulalip Tribes. Everett and Marysville, Washington. February 2001.

Kyte, M.A., and J.P. Houghton. 1994. Results of La Conner marina entrance maintenance dredging fish monitoring, 1993-1994 final report. Report of Pentec Environmental, Inc., Edmonds, Washington. Prepared for the Port of Skagit County, Burlington, Washington.

Larson, K.W., and C. Cassidy. 1990. Entrainment of Anadromous Fish by Hopper Dredging at the Mouth of the Columbia River, Oregon and Washington. U.S. Army Corps of Engineers, Portland District, Portland, Oregon.

Larson, K.W., and C.E. Moehl. 1988. Entrainment of Anadromous Fish by Hopper Dredge at the Mouth of the Columbia River. Pages 102-112, in C.A. Simenstad, ed., Effects of Dredging on Anadromous Pacific Fishes, University of Washington, Seattle, Washington.

McGraw, K.A., and D. A. Armstrong. 1988. Fish Entrainment by Dredges in Grays Harbor, Washington. Pages 113-131, in C.A. Simenstad, ed., Effects of Dredging on Anadromous Pacific Fishes, University of Washington, Seattle, Washington.

NMFS (National Marine Fisheries Service, currently known as NOAA Fisheries). 2003a. Endangered Species Act Section 7 Informal Consultation and Magnuson-Stevens Fishery Conservation and Management Act essential fish habitat consultation for the contaminated sediment cleanup of the Marine Sediments Unit of the Pacific Sound Resources (PSR) Superfund site, Elliott Bay, Washington. NOAA Fisheries No. 2003/00224, WRIA 9. Concurrence letter to Sally Thomas, Superfund Project Manager, U.S. Environmental Protection Agency, dated March 20, 2003.

NMFS. 2003b. Magnuson-Stevens Fishery Conservation and Management Act essential fish habitat consultation for the Puget Sound Dredged Disposal Analysis, Elliott Bay, Washington. NMFS Tracking No. 2002/00275. Concurrence letter to Mark

Ziminske, Chief, Environmental Resources Section, U.S. Army Corps of Engineers, dated June 2, 2003.

NMFS (National Marine Fisheries Service, currently known as NOAA Fisheries). 2003c. Endangered Species Act Section 7 Informal Consultation and Magnuson-Stevens Fishery Conservation and Management Act essential fish habitat consultation for the proposed 2005-2009 Maintenance Dredging of the Snohomish River Navigation Channel WRIA 7. NMFS Tracking No. 2003/01258. Concurrence letter to Mark Ziminske, Chief Environmental Resources Section. U.S. Army Corps of Engineers, dated October 31, 2003 and as amended via email on December 15, 2003 and July 22, 2004.

NMFS. 2000. Section 7 Informal Consultation on the PSDDA Programmatic Biological Evaluation for non-dispersive disposal sites (WSB-99-235) and dispersive sites (WSB-99-592), Elliott Bay, Washington. Concurrence letter to Colonel James Rigsby, District Engineer, U.S. Army Corps of Engineers, dated May 31, 2000.

Pacific Fishery Management Council. 1998a. *Essential Fish Habitat for Coastal Pelagic Species* (*Appendix D from Amendment 8 of the Coastal Pelagic Species Fishery Management Plan*). **<http://swr.ucsd.edu/hcd/cpsefh.pdf>.**

Pacific Fishery Management Council. 1998b. *Essential Fish Habitat: West Coast Groundfish Appendix*. **<http://www.nwr.noaa.gov/1sustfsh/efhappendix/page1.html>.**

Pentec Environmental. 2004. Draft Biological Evaluation, Riverside Business Park, Everett, Washington. March 18, 2004. Prepared for Reid Middleton and the Port of Everett. Pentec #12021-116.

Pentec Environmental. 2003. Jetty Island Berm Renourishment Impact Study, Everett Washington. Prepared for the Port of Everett. March 5, 2003. Rpt. #12021-94.

Pentec Environmental. 2001. Jetty Island eelgrass survey. Prepared for the Port of Everett by Pentec Environmental, Edmonds, Washington.

Pentec Environmental. 2000. US Army Corps of Engineers and Port of Everett Jetty Island Habitat Renourishment, Biological Evaluation. Prepared for the Port of Everett by Pentec Environmental. June 7, 2000.

Pentec Environmental. 1997. Ecological functions of a saltmarsh/mudflat complex created using clean dredged material, Jetty Island, Washington. *Pgs* 156-170, *In*, Wetland and Riparian Restoration: taking a broader view, proceedings of a conference, Society for Ecological Restoration, International Conference, September 14-16, 1995, Seattle, Washington. Published by U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

Pentec Environmental. 1996. Beneficial use of dredged materials, Jetty Island habitat development demonstration project. Year 5 monitoring report. Prepared for the Port of Everett by Pentec Environmental, Edmonds, Washington.

Pentec Environmental. 1992. Port of Edmonds landscape analysis for Port Gardner and the Snohomish River estuary. Pentec Environmental, Edmonds, Washington.

Pentilla, D. undated. Washington State fact sheets on distribution, abundance, and life history surf smelt, sand lance, and Pacific herring. Washington Department of Fish and Wildlife.

Pfeifer, R. 1991. Seattle District Fish Biologist, Washington State Department of Wildlife, Mill Creek, Washington. Personal communication with R.Sturim, of Roy F. Weston, Inc. July 10, 1991.

Port of Everett. 1999. Amendment to comprehensive scheme of harbor improvements for Riverside Business Park, draft supplemental environmental impact statement. Port of Everett, Washington.

Reine, K.J., D.G. Clarke, E.C. McNair and R.M. Engler. 1998. Entrainment by Hydraulic Dredges- A Review of Potential Impacts., Technical Note DOER-E1, U.S. Army Research and Development Center (Waterways Experiment Station), Vicksburg, Mississippi.

Romberg, P., C. Homan, and D. Wilson. 1995. The Denny Way Sediment Cap. 1990-1992 Data. King County Department of Metropolitan Services (METRO)., Seattle, Washington.

Snohomish River Basin Salmonid Recovery Technical Committee. 2002. Snohomish River Basin Salmonid Habitat Conditions Review. Snohomish County Department of Public Works, Surface Water Management Division. Everett, WA.

Talasaea Consultants. 1998. Riverside Industrial Park, Everett Washington: Wetland Delineation and Buffer Enhancement Report. Prepared for Trammell Crow Company, Bellevue, Washington. August 7, 1998.

Tanner, C.D., J.R. Cordell, J. Rubey, and L.M. Tear. 2002. *Restoration of freshwater intertidal habitat functions at Spencer Island, Washington.* Restoration Ecology Vol. 10 (3): 564-576.

U.S. Army Corps of Engineers. 2003. Biological Assessment, FY 2004-2008 maintenance dredging of the Snohomish River navigation channel, lower and upstream settling basins, Everett, Washington. September 29, 2003. Amended on November 13, 2003 and May 28, 2004 via Memoranda for Navigation Section amending proposed dredging dates to FY 2005 through 2009 and adding Riverside upland disposal site to project description.

U.S. Army Corps of Engineers and U.S. Environmental Protection Agency. 2002. Biological Assessment for the Pacific Sound Resources Superfund Site. December 2002.

U.S. Army Corps of Engineers. 2000a. Programmatic Biological Evaluation for the Puget Sound Dredged Disposal Analysis (PSDDA) non-dispersive disposal sites. Prepared by Jones and Stokes Associates, Inc. and Natural Resources Consultants, Inc., February 2000.

U.S. Army Corps of Engineers. 2000b. Programmatic Biological Evaluation for the Puget Sound Dredged Disposal Analysis (PSDDA) non-dispersive disposal sites. Prepared by Seattle District Corps of Engineers, Environmental Resources Section, April 2000.

U.S. Army Corps of Engineers. 1991. Lower Snohomish River flood control study, reconnaissance study. USACE, Seattle District. March 1991.

U.S. Army Corps of Engineers. 1975. Final Environmental Impact Statement, Everett Harbor and Snohomish River Navigation Project, Everett, Washington. USACE, Seattle District. Final signed September 17, 1975.

U.S. Fish and Wildlife Service (USFWS). 2003a. Endangered Species Act Section 7 Informal Consultation for the contaminated sediment cleanup of the Marine Sediments Unit of the Pacific Sound Resources (PSR) Superfund site, Elliott Bay, Washington. USFWS reference No. 1-3-03-1-0896. Concurrence letter to Sally Thomas, Superfund Project Manager, U.S. Environmental Protection Agency, dated March 28, 2003.

U.S. Fish and Wildlife Service (USFWS). 2003b. Endangered Species Act Section 7 Informal Consultation for the 2005-2009 Snohomish River Navigational Channel Maintenance Dredging. USFWS reference No. 1-3-04-I-0003. Concurrence letter to Colonel Debra Lewis, District Engineer, dated December 16, 2003 and amended via email July 22, 2004.

U.S. Fish and Wildlife Service (USFWS). 2000. Endangered Species Act Section 7 Informal Consultation for PSDDA non-dispersive disposal sites in Pierce, King, Snohomish, and Whatcom Counties, Washington. USFWS reference No. 1-3-00-IR-1063. Concurrence letter to Mark Ziminske, Chief, Environmental Resources Section, U.S. Army Corps of Engineers, dated May 17, 2000.

Washington Department of Fish and Wildlife (WDFW). 1994. 1992 Washington State salmon and steelhead stock inventory, appendix one, Puget Sound stocks, North Puget Sound Volume. Olympia, Washington. June 1994.

Washington Department of Fish and Wildlife (WDFW). 2003. Priority Habitats and Species Database. Database search conducted by V. Luiting, August 22, 3003.

Wilson, D. and P. Romberg. 1996. The Denny Way Sediment Cap. 1994 Data. King County Department of Natural Resources Water Pollution Control Division., Seattle, Washington.

13. FIGURES

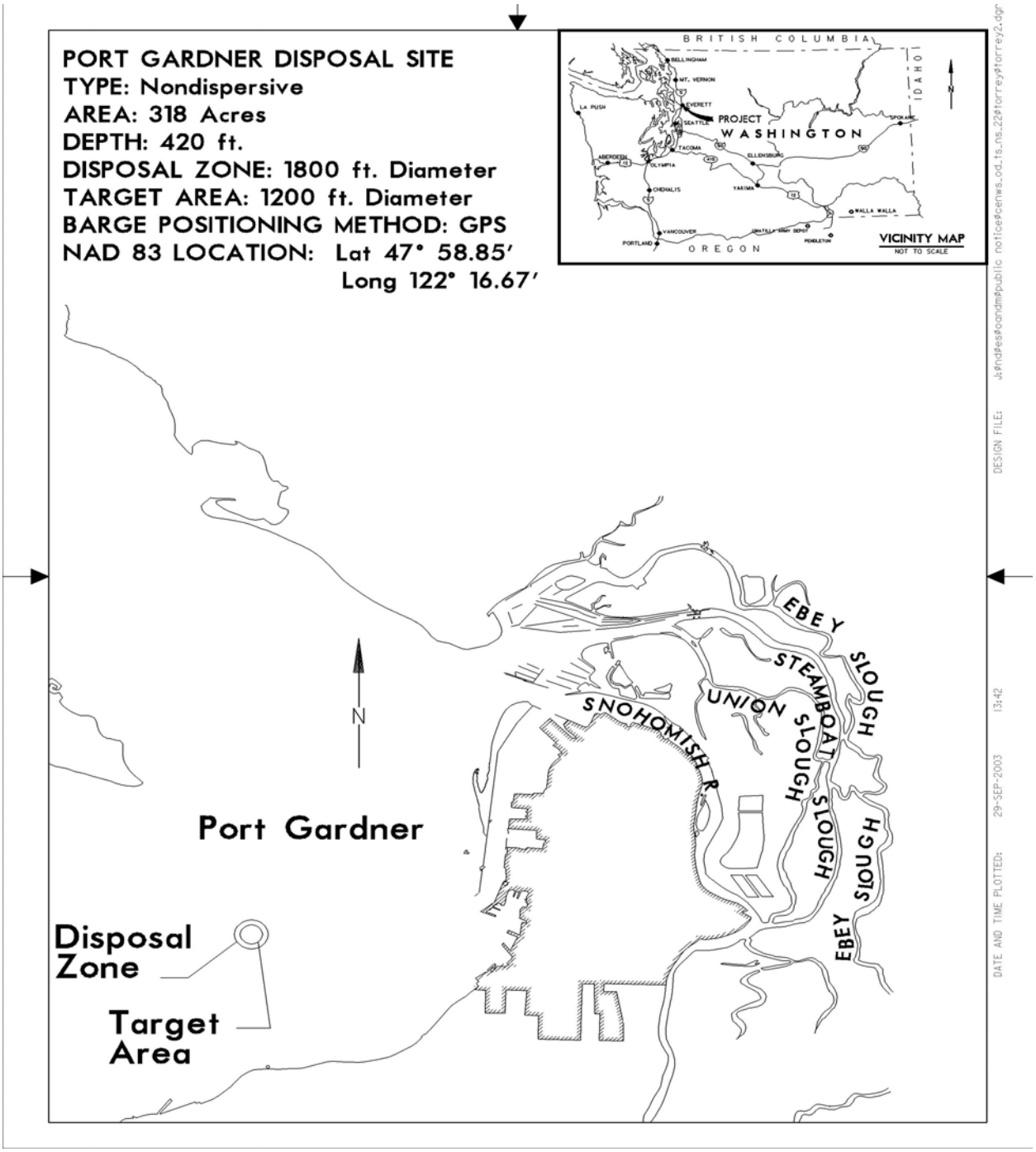

Figure 1: Vicinity Map, showing Snohomish River Estuary, Port Gardner, and PSSDA Site

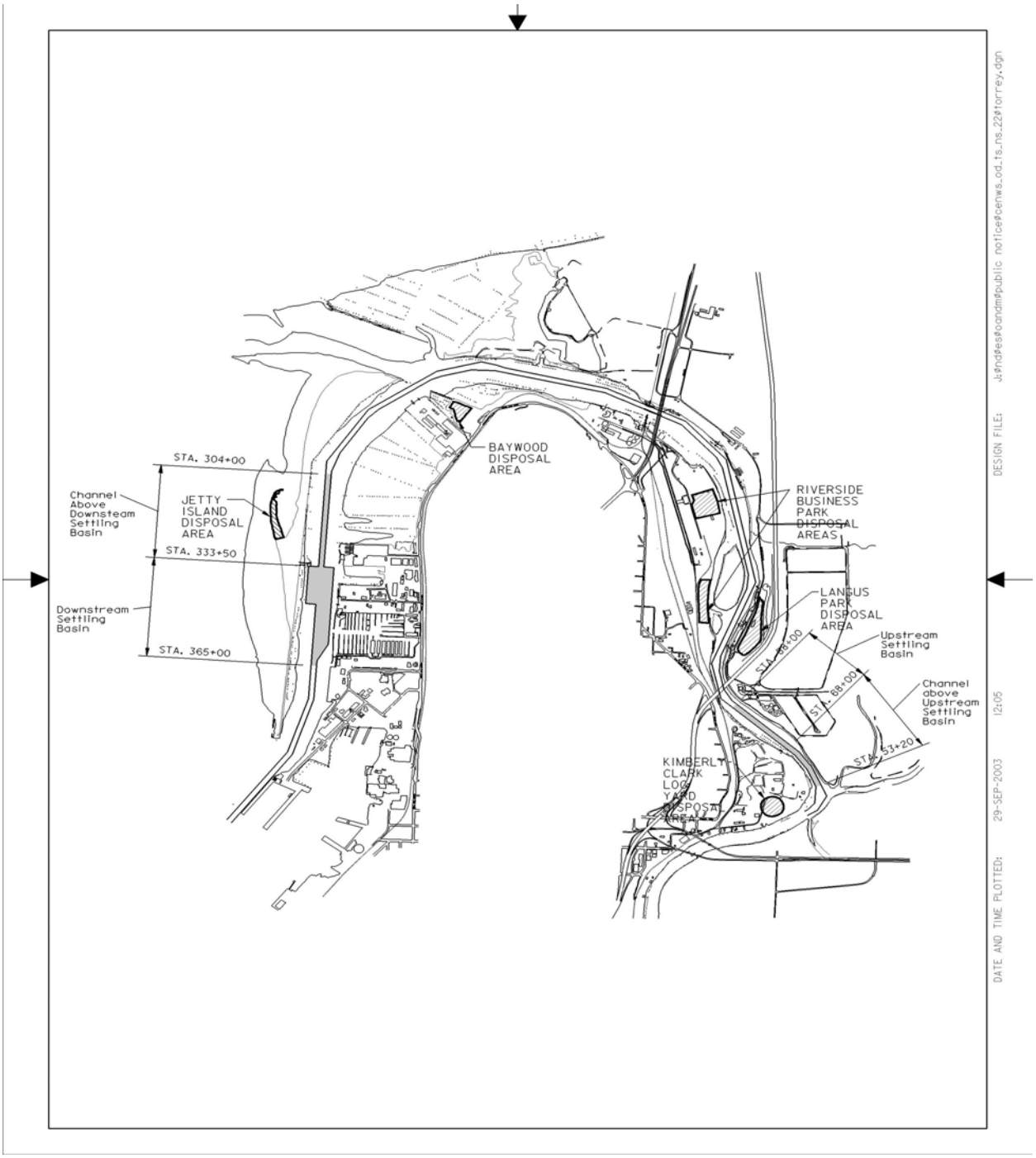

Figure 2: Location and extent of dredging in upper and downstream settling basins and location of disposal sites.

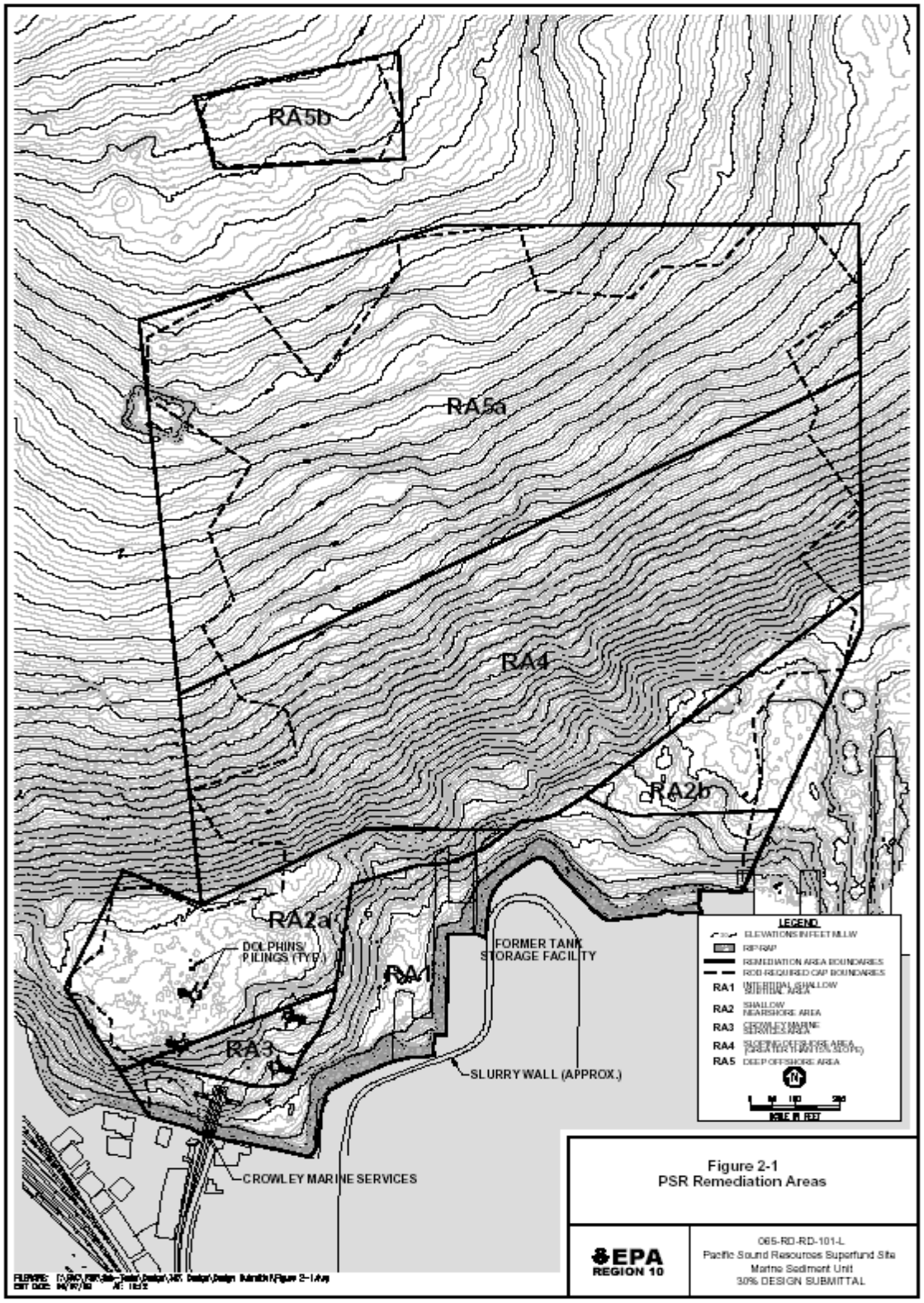

Figure 3: PSR Superfund site, MSU Remediation Areas 5a and 5b locations and extent

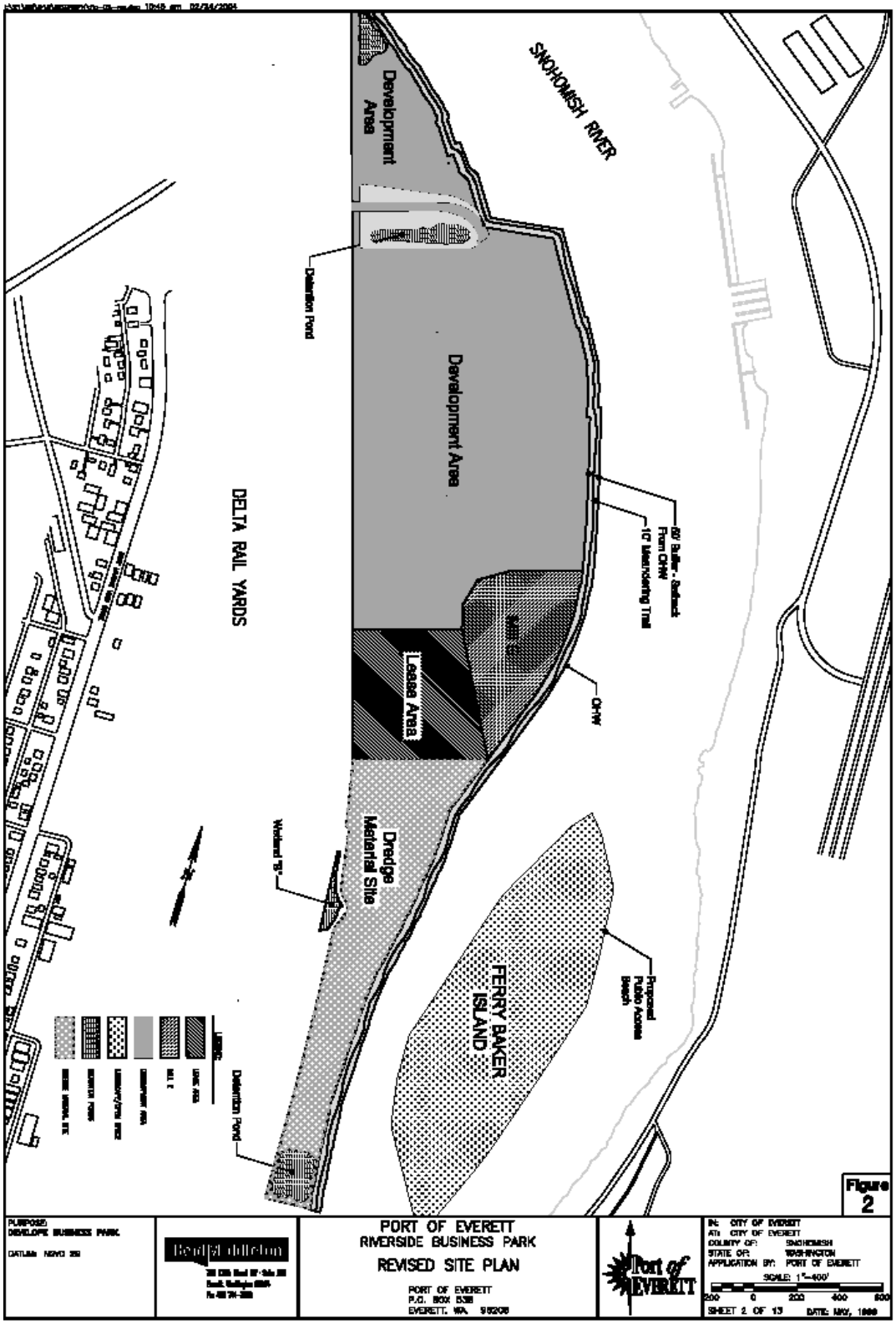

Figure 4: Riverside Business Park site and dredge material cell

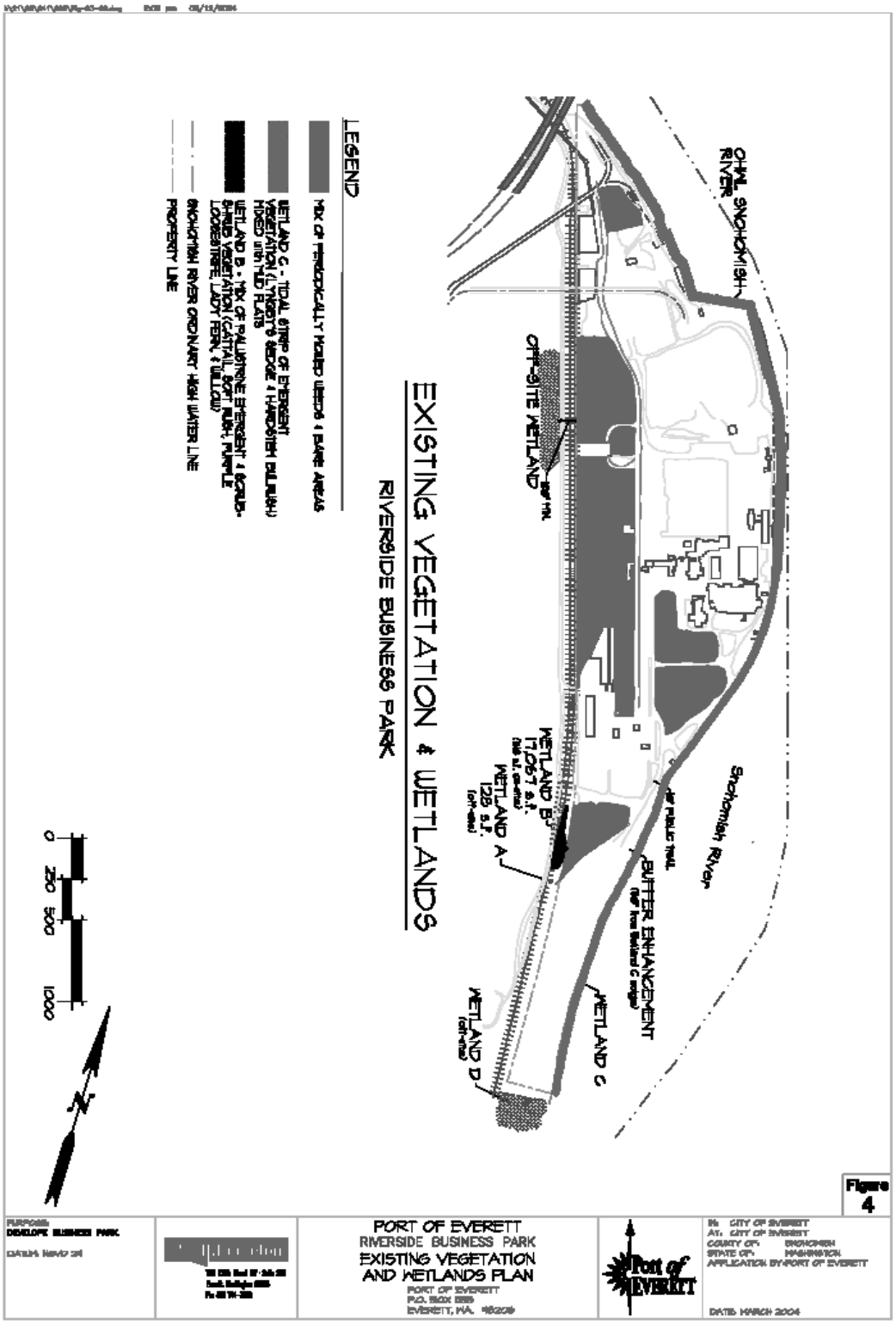

Figure 5: Riverside Business Park site, extent and location of wetlands

14. PHOTOS

Photo 1: Riverside Business Park site facing south, southern portion, dredged material cell and rehandling of material (April 2004).

Photo 2: Hydraulic pipeline (not in use) showing buoys used to cap ends during placement (April 2004).

Photo 3: Salt marsh bench fringing eastern edge of Riverside site, facing downstream; hydraulic pipeline crosses bench at downstream end, beneath bridge (April 2004).

Photo 4: Hydraulic pipeline floating in Snohomish river channel (facing downstream) and extending onto and over the salt marsh bench to deposit material within the Riverside site (not visible, but off lower left corner of photo).

Photo 5: Southeastern corner of Riverside site showing riparian edge of river and berm separating the dredge disposal cell from the riparian edge (April 2004).

Photo 6: Previously disturbed area of riparian buffer through which weirs are placed during return of water to river, facing upstream to the north (April 2004).

Photo 7: Overview of general site conditions over majority of the Riverside Business Park site, facing south (April 2004).

15. APPENDICES

APPENDIX A:

401 Water Quality Certifications

and Corps Section 404(b)(1) analysis

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
P.O. Box 47600 • Olympia, Washington 98504-7600
(360) 407-6000 • TDD Only (Hearing Impaired) (360) 407-6006

REGISTERED MAIL

September 17, 2004

Ms. Patricia Miller
Seattle District Corps of Engineers, Navigation Branch
P.O. Box 3755
Seattle, WA 98124-3755

RE: Water Quality Certification/Modification No.1648 1st Amendment
Corps No. CENWS-OD-TS-NS-22
Maintenance dredging of the Snohomish River navigation channel, downstream and upstream settling basins, Everett, Snohomish County, Washington.

Dear Ms. Miller:

On September 14, 2004, Ecology issued the Seattle District Corps of Engineers, Navigation Branch (Corps) a Water Quality Certification (Certification) for the above-referenced project. After discussions with the Corps, Ecology acknowledged the need to clarification and/or change several conditions in the Certification. Attached is an amended Certification/Order. The conditions that have been modified are bold and underlined.

This amendment may be appealed by following the procedures described in the Order. If you have any questions about this letter or the enclosed Order, please contact Helen Pressley at 360 407-6076.

Sincerely,

Brenden McFarland
Environmental Review and Transportation Section Manager
Shorelands and Environmental Assistance Program

cc: Victoria Luiting, Corps
Yvonne Oliva, Ecology

DEPARTMENT OF ECOLOGY

In the Matter of Granting a Water	)	**Order # 1648 1st Amendment**
Quality Certification/Modification to:	)	(Corps No. CENWS-OD-TS-NS-22)
The Seattle District Corps of Engineers	)	Maintenance dredging of the Snohomish
In Accordance with 33 U.S.C. 1341	)	River navigation channel, downstream
[FWPCA § 401], RCW 90.48.260, RCW	)	and upstream settling basins, Everett
90.48.120 and WAC 173-201A	)	Washington, Snohomish County

ATTN: Ms. Patricia Miller
Seattle District Corps of Engineers, Navigation Branch
P.O. Box 3755
Seattle, WA 98124-3755

On April 14, 2004 a request for water quality certification from the State of Washington was submitted for the above-referenced project(s) pursuant to the provisions of 33 U.S.C. 1341 (FWPCA§ 401). The request for certification was made available for public review as a revision to Corps Public Notice CENWS-OD-TS-NS-22 dated April 14, 2004.

The proposed work described in the above referenced public notice is the maintenance dredging by the Corps of Engineers of the navigation channel, downstream and upstream settling basins in the lower Snohomish River. During the years 2005 to 2009, hydraulic pipeline and/or clamshell dredging of approximately 800,000 cubic yards of clean sandy material from the upstream settling basin and 200,000 cubic yards from several shoals in the 8-foot deep river channel is proposed with disposal at a combination of several confined upland sites. These include the PSR and/or the Port Gardner open water site, and possibly Jetty Island. Also proposed is hydraulic pipeline and/or dredging of approximately 500,000 cubic yards of clean sandy dredged material from the downstream settling basin with disposal at Jetty Island, PSR and/or the Port Gardner open water site. **The Corps is also proposing to place approximately 150,000 cubic yards of sediment at the River Side Business Park Disposal site for beneficial uses.**

AUTHORITIES

In exercising authority under 33 U.S.C. 1341, RCW 90.48.260 and RCW 90.48.120, Ecology has investigated this application pursuant to the following:

1. Conformance with applicable water quality-based, technology-based, and toxic or pretreatment effluent limitations as provided under 33 U.S.C. Sections 1311, 1312, 1313, 1316, and 1317 (FWPCA Sections 301, 302, 303, 306, and 307),

2. Conformance with the state water quality standards as provided for in Chapter 173-201A WAC authorized by 33 U.S.C. 1313 and by Chapter 90.48 RCW, and with other appropriate requirements of state law, and

3. Conformance with the provision of using all known, available and reasonable methods to prevent and control pollution of state waters as required by RCW 90.48.010.

In view of the foregoing and in accordance with 33 U.S.C. 1341, 90.48.260 RCW, 90.48.120 RCW and Chapter 173-201A WAC, certification is granted to the Seattle District Corps of Engineers subject to the following conditions:

I. Short-term Modification to the Water Quality Criteria.

The dredging and disposal needed to protect navigational safety may result in the temporary exceedance of certain state water quality criteria or special conditions specified in Chapter 173-201A WAC. Under WAC 173-201A-110, Ecology may grant a "Short-term Modification to allow for such exceedances of the criteria on a short-term basis when necessary or to otherwise protect the public interest".

The project reach of the lower Snohomish River is classified as Class A waters; thus, Class A water quality standards of 173-201A-030(2) apply, except as specifically modified by this order. Temporary dilution zones, or mixing zones, are authorized for dredging and/or disposal to allow for temporary exceedances of certain water quality standards as a result of disturbing in-place sediments. Within the mixing zones, except as noted, water quality criteria are modified as follows:

1. **Turbidity.** Class A water quality standards for turbidity are waived within the specified mixing zones as outlined within specific conditions of this Order.

2. **Dissolved Oxygen.** Class A within the specified dilution zones, provided that total dissolved oxygen levels do not cause water quality standards for dissolved oxygen to drop below 6.0 mg/L.

II. Mixing Zones.

Mixing zones and other applicable conditions are specified below under the separate categories of the project. The mixing zones are considered reasonably sufficient to allow for the temporary impacts of the project. All other applicable water quality standards shall remain in effect in the mixing zones and all water quality standards are expected to be met outside of the mixing zones.

III. Duration of the Modification.

Per WAC 173-201A-110, a modification of a water quality criterion (such as turbidity) within a mixing zone is intended for short-term periods of time, ***such as for hours or days rather than weeks or months.*** In this case, Ecology finds that the effects of maintenance dredging are short-term in that dredging/disposal occurs in a matter of days. However, within the context of this certification, no degradation of water quality will be allowed if such degradation is found to significantly interfere with or become injurious to characteristic water uses or cause long-term harm to the environment of the lower

Snohomish River.

This modification does not authorize any in-water work during closure periods specified within this Order or the HPA.

IV. Monitoring.

Water Quality Monitoring shall be done during dredging, upland disposal, return water, and/or beach nourishment. The following monitoring requirements shall be undertaken to assess the water quality effects of the dredging operation, upland disposal, return water, and/or beach nourishment, and barge dewatering. The results will be used to: 1) assess compliance with water quality standards; 2) provide notification of any exceedance of a standard; and 3) assess the need for continuing the monitoring activity and appropriate frequency of monitoring. Monitoring results (excepting exceedances, which shall be reported immediately) shall be sent weekly to Helen Pressley at Department of Ecology, PO Box 47600, Olympia WA 98504-7600, (360) 407-6076, or hpre461@ecy.wa.gov.

A. An exceedance of the water quality standards could result in corrective action depending upon the degree of the exceedance and/or the risk posed by the exceedance to beneficial uses of the water body.

B. Monitoring shall be done for the first five days of dredging. Monitor 2 times per day as outlined in the Corps **monitoring plan dated August 17, 2004.**

1. At the monitoring locations, water samples shall be taken at the surface (2.0 feet below), mid-depth, and near bottom (2.0 feet above). Samples taken within the mixing zone and at the mixing zone boundary shall be adjusted within the depth range to target the turbidity plume which will be tracked visually and/or hydro-acoustically. If no distinct turbidity plume can be identified within the depth range, the samples will be taken at the standard depths (i.e., surface, mid-depth, and near bottom).

2. Monitoring points shall be 100 feet up stream (representative of background), at the outer limit of the mixing zone (point of compliance) and at the discharge point

C. ~~Monitoring shall be done for the remainder of the dredging period.~~ **Condition IV.C is deleted from this Order.**

V. Dredging.

The Corps shall conduct its dredging activities according to the following conditions:

A. The following general condition applies to all dredging activities in the navigational channel and the downstream and upstream settling basins.

Dredging operations shall be conducted in a manner that minimizes the disturbance or siltation of adjacent waters and prevents the accidental discharge of petroleum products, chemicals or other toxic or deleterious substances into waters of the State.

B. The following specific conditions apply to each type of dredging activity:

1. Clamshell Dredging:

   a. Dilution Zone: ~~150 feet radially and~~ 600 feet downcurrent from the point of dredging.

   b. Each pass of a clamshell bucket shall be complete with no stockpiling done in the water. Dredged material shall not be stockpiled on a temporary or permanent basis below the ordinary high water line.

   c. Large debris picked up by a clamshell dredge shall be removed from the dredged sediment prior to disposal at disposal sites. Large debris includes old pilings or sinker logs [longer then three feet or greater than one foot in diameter], tree stumps, and man-made materials such as scrap metals, car bodies, broken concrete or asphalt and the like.

2. Hydraulic Dredging:

   a. Mixing Zone for Hydraulic Dredging: ~~150 feet radially from~~ **300 feet downcurrent of** the point of dredging ~~and 300 feet downcurrent~~.

   b. The hydraulic dredge shall be operated with the intake positioned at or below the surface of the sediment being removed. The intake shall be raised no higher then three feet above the bed surface for brief periods to purge or flush the intake system.

3. General Dredging Conditions:

   a. The 460,000 cubic yards of dredged material shall be distributed to provide the greatest benefit to the navigational requirements and potential beneficial uses of the material. The approximately 800,000 cubic yards of clean sandy material from the upstream basin, and the approximately 500,000 cubic yards from the downstream basin shall be disposed of at either the Port Gardner open water site, the Pacific Sound Resources site**, the Riverside Business Park Disposal site,** or at Jetty Island. Disposal is authorized only within the footprint prescribed by the DMMP for the disposal sites.

   b. A Dredging Plan is required and shall be made available for review and approval at the pre-construction meeting to be convened at the Seattle Corps of Engineers office prior to the start of dredging.

c. All dredging is to be done using either a clamshell dredge or a hydraulic dredge. The use of any other type of dredge will require prior approval from Ecology.

VI. Disposal.

The material proposed for dredging has been tested according to the procedures specified in the DMMP, a multi-agency program for the evaluation of dredged material. The proposed disposal of dredged materials would occur at the PSR Superfund Site in Elliott Bay, at the WDNR PSSDA open-water disposal site in Port Gardner and at the Riverside Business Park Disposal area. Other sites such as Jetty Island and/or alternative beneficial use sites shall be determined based on needs.

1. In-water Disposal:

a. Disposal of dredged material at the PSDDA in-water disposal site in ~~Elliott Bay~~ **Port Gardner** shall be by bottom dump scow only; any other disposal method must be approved by Ecology.

b. Both floatable and non-floatable debris greater then 24 inches in size shall be removed from the dredged material prior to disposal at the in-water disposal sites and shall be suitably disposed of at an upland location.

2. Upland Disposal

a. **Mixing Zone [for single-point Effluent Discharge]: 600 feet downcurrent from the point of discharge..**

b. **The following best management practices (BMPs) shall be implemented at the upland disposal sites:**

1. **The outfall should be located so as to provide the maximum amount of dilution or dispersion of the effluent and to minimize any potential scour or erosion effects to more sensitive aquatic resources.**
2. **To the greatest extent practicable, the upland sites shall be stabilized to prevent significant offsite erosion of the dredged material by either water or wind transport.**

VII. Emergency and/or Contingency Measures.

If dredging/disposal operations ~~are found not to be in compliance with the provisions of this order, or~~ result in conditions causing distressed or dying fish, the operator shall immediately take the following actions:

1. Cease operations **causing the distressed or dying fish**.

2. Assess ~~the cause of the water quality~~ problem and take appropriate measures to correct the problem and/or prevent further environmental damage.

3. In the event of finding distressed or dying fish, the operator shall collect fish specimens and water samples in the affected area and, within the first hour of such conditions, make every effort to have the water samples analyzed for dissolved oxygen and total sulfides. Ecology may require such sampling and analyses before allowing the work to resume.

4. Notify the Department of Ecology and the Department of Fish and Wildlife of the nature of the problem, any actions taken to correct the problem, and any proposed changes in operations to prevent further problems.

VIII. Spill Prevention and Control.

A. Any discharge of oil, fuel, or chemicals into state waters, or onto land with a potential for entry into state waters, is prohibited.

B. Fuel hoses, oil drums, oil or fuel transfer valves and fittings, etc., shall be checked regularly for drips or leaks, and shall be maintained and stored properly to prevent spills into state waters. Proper security shall be maintained to prevent vandalism.

C. In the event of a discharge of oil, fuel, or chemicals into state waters, or onto land with a potential for entry into state waters, containment and cleanup efforts shall begin immediately and be completed as soon as possible, taking precedence over normal work. Cleanup shall include proper disposal of any spilled substances and used cleanup materials.

D. Spills into state waters, spills onto land with a potential for entry into state waters, or other significant water quality impacts, shall be reported immediately to Ecology's Northwest Regional Office at (425) 649-7000 (a 24-hour phone number).

IX. Duration of Water Quality Certification (WQC).

This WQC shall remain in effect for a period of five (5) years from date of issuance. Continuing maintenance dredging beyond the five year term of this Order will require separate certifications every five years.

Ecology reserves the option to reassess the terms of this Order and amend or revoke, as necessary, in the event that:

1. New sources of potential contamination are discharged or otherwise stand to significantly affect the quality of sediments dredged from the Snohomish River navigation channel, or

2. New information indicates that dredging and/or disposal activities are having a significant adverse impact on water quality or characteristic uses of the lower ~~Columbia~~ **Snohomish** River.

X. Notification

A. The Corps or their designated contractor shall notify Ecology at least 14 days prior to the scheduled start of dredging in any year. The Ecology person to contact is Helen Pressley at (360) 407-6076.

B. The Corps shall submit an updated application to Ecology if the information contained in the project is altered by route modification or facility relocation submittals to the federal agency and/or state agencies. Within 30 days of receipt of an updated application Ecology will determine if a modification to this Order is required. All submittals shall be sent to the Federal Permit Coordinator at the above address.

XI. General Conditions

A. This certification does not exempt and is provisional upon compliance with other statutes and codes administered by federal, state, and local agencies.

B. Copies of this Order shall be kept on the job site and readily available for reference by the Corps, Ecology personnel, the contractor, and other appropriate state and local government inspectors.

C. Ecology retains jurisdiction to make modifications hereto through supplemental order, if it appears necessary to protect the public interest during the construction and monitoring of this project.

D. This certification does not exempt and is provisional upon compliance with other statutes and codes administered by federal, state, and local agencies.

E. The Applicants shall be considered out of compliance with this certification if:

1. The project is constructed and/or operated in a manner not consistent with the description contained in the Corps' Public Notice.

2. Five years elapse between the date of the issuance of this certification and the start of construction and/or discharge. However, the expiration date may be

extended by Ecology at the request of the permittee.

XII. Penalties. Failure to comply with this Order may result in the issuance of civil penalties or other actions, whether administrative or judicial, to enforce the terms of this Order.

XIII. Appeal Process. Any person aggrieved by this Order may obtain review thereof by appeal. The applicant can appeal up to 30 days after receipt of the permit, and all others can appeal up to 30 days from the postmarked date of the permit. The appeal shall be sent to the Washington Pollution Control Hearings Board, PO Box 40903, Olympia WA 98504-0903. Concurrently, copies of the appeal shall be sent to the Department of Ecology, Enforcement Section, PO Box 47600, Olympia WA 98504-7600 and Department of Ecology, SEA Program, Attention Ms. Loree' Randall, PO Box 47600, Olympia WA 98504-7600. These procedures are consistent with the provisions of Chapter 43.21B RCW and the rules and regulations adopted thereunder.

Dated Sept 17, 2004 at Lacey, Washington

Brenden McFarland, Manager
Environmental Review and Transportation Section
Shorelands and Environmental Assistance Program
Department of Ecology

HYDRAULIC PROJECT APPROVAL

RCW 77.55.100 - appeal pursuant to Chapter 34.05 RCW

State of Washington
Department of Fish and Wildlife
Region 4 Office
16018 Mill Creek Boulevard
Mill Creek, Washington 98012

DATE OF ISSUE: August 16, 2004

LOG NUMBER: ST-G3118-01

PERMITTEE	AUTHORIZED AGENT OR CONTRACTOR
U.S. Army Corps of Engineers Navigation Section ATTENTION: Patty Miller PO BOX 3755 Seattle, WA 98124-3755 (206)764-6908	Not Applicable

PROJECT DESCRIPTION: Snohomish R. Maintenance Dredging Project

DATABASE DESCRIPTION: Maintenance, Moveable, Temporary, Sand/Gravel/Cobble Mix, Channel Modification, Dredging, Estuarine, Buried below bed

PROJECT LOCATION: Everett Harbor and Snohomish River [48.008 N, 122.221 W]

#	WRIA	WATER BODY	TRIBUTARY TO	1/4 SEC.	SEC.	TOWNSHIP	RANGE	COUNTY
01	07.9082	Snohomish River	Puget Sound		18	29 North	05 East	Snohomish
01	07.9082	Port Gardner	Puget Sound		16	29 North	05 East	Snohomish

NOTE: This Hydraulic Project Approval pertains only to the provisions of the Washington State Fisheries and Wildlife Codes. It is the permittee's responsibility to apply for and obtain any additional authorization from other public agencies (local, state and/or federal) that may be necessary for this project.

PROVISIONS

1. **TIMING LIMITATIONS:** The project may begin **October 15, 2004** and shall be completed by **December 31, 2009**, provided:

   a. Work below the ordinary high water line shall not occur from **February 15** through **October 14** of any year for the protection of migrating juvenile salmonids.

2. Work shall be accomplished per plans and specifications entitled, Everett Harbor & Snohomish R. Maintenance Dredging 2005-2009, dated March 15, 2004, and submitted to the Washington Department of Fish and Wildlife, except as modified by this Hydraulic Project Approval. These plans reflect design criteria per Chapter 220-110 WAC. These plans reflect mitigation procedures to significantly reduce or eliminate impacts to fish resources. A copy of these plans shall be available on site during construction.

3. NOTIFICATION REQUIREMENT: Notify the Area Habitat Biologist (AHB) listed below prior to placing dredged materials on Jetty Island to discuss the details of renourishing and eelgrass monitoring.

4. Barges shall anchor to the bottom of the navigation channel, not to the adjacent intertidal or upland areas.

5. A clamshell dredge shall be used for dredging. Each pass of the clamshell dredge bucket shall be complete.

6. A hydraulic pipeline dredge may also be used for dredging.

7. The hydraulic dredge shall only be operated with the intake at or below the surface of the material being removed. The intake shall only be raised a maximum of three feet above the bed for brief periods of purging or flushing the intake system.

8. Dredging shall not occur to the extreme outer edge of the basin. Intertidal areas shall not be dredged.

9. Dredged material shall not be stockpiled below the ordinary high water line.

10. Dredged materials shall be deposited at an approved disposal site.

11. Eelgrass and kelp shall not be adversely impacted due to any project activities (e.g., barge shall not ground, equipment shall not operate, and other project activities shall not occur in eelgrass and kelp).

12. Removal or destruction of overhanging bankline vegetation shall be limited to that necessary for the construction of the project.

13. Intertidal wetland vascular plants shall not be adversely impacted due to project activities (e.g., barge shall not ground, equipment shall not operate, and other activities shall not occur in intertidal wetland vascular plants). If such vegetation is adversely impacted, it shall be replaced using proven methodology.

14. All natural habitat features on the beach larger than 12 inches in diameter, including trees, stumps, logs, and large rocks, shall be retained on the beach following construction. These habitat features may be moved during construction if necessary.

15. Project activities shall be conducted to minimize siltation of the beach area and bed.

16. All debris or deleterious material resulting from construction shall be removed from the beach area and bed and prevented from entering waters of the state.

17. An emergency spill containment kit must be located on site along with a pollution prevention plan detailing planned fueling, materials storage, and equipment storage. Waste storage areas must be prepared to address prevention and cleanup of accidental spills.

18. No petroleum products or other deleterious materials shall enter surface waters.

19. If at any time, as a result of project activities, fish are observed in distress or a fish kill occurs, or water quality problems develop, immediate notification shall be made to the regional offices of WDFW at (425) 775-1311 and Ecology at (425) 649-7000.

20. Project activities shall not degrade water quality to the detriment of fish life.

SEPA: No SEPA required. Permitted by NEPA.

APPLICATION ACCEPTED: July 27, 2004 **ENFORCEMENT OFFICER:** Lambert 041 [P3]

HYDRAULIC PROJECT APPROVAL

RCW 77.55.100 - appeal pursuant to Chapter 34.05 RCW

State of Washington
Department of Fish and Wildlife
Region 4 Office
16018 Mill Creek Boulevard
Mill Creek, Washington 98012

DATE OF ISSUE: August 16, 2004 **LOG NUMBER:** ST-G3118-01

Laura Praye (425) 379-2306 Area Habitat Biologist	Laura Praye	**for Director** **WDFW**

cc: Helen Pressely, DOE
Suzanne Skadowski, COE

GENERAL PROVISIONS

This Hydraulic Project Approval (HPA) pertains only to the provisions of the Fisheries Code (RCW 77.55 - formerly RCW 75.20). Additional authorization from other public agencies may be necessary for this project.

This HPA shall be available on the job site at all times and all its provisions followed by the permittee and operator(s) performing the work.

This HPA does not authorize trespass.

The person(s) to whom this HPA is issued may be held liable for any loss or damage to fish life or fish habitat which results from failure to comply with the provisions of this HPA.

Failure to comply with the provisions of this Hydraulic Project Approval could result in a civil penalty of up to one hundred dollars per day or a gross misdemeanor charge, possibly punishable by fine and/or imprisonment.

All HPAs issued pursuant to RCW 77.55.100 or 77.55.200 are subject to additional restrictions, conditions or revocation if the Department of Fish and Wildlife determines that new biological or physical information indicates the need for such action. The permittee has the right pursuant to Chapter 34.04 RCW to appeal such decisions. All HPAs issued pursuant to RCW 77.55.110 may be modified by the Department of Fish and Wildlife due to changed conditions after consultation with the permittee: PROVIDED HOWEVER, that such modifications shall be subject to appeal to the Hydraulic Appeals Board established in RCW 77.55.170.

APPEALS - GENERAL INFORMATION

IF YOU WISH TO APPEAL A DENIAL OF OR CONDITIONS PROVIDED IN A HYDRAULIC PROJECT APPROVAL, THERE ARE INFORMAL AND FORMAL APPEAL PROCESSES AVAILABLE.

A. INFORMAL APPEALS (WAC 220-110-340) OF DEPARTMENT ACTIONS TAKEN PURSUANT TO RCW 77.55.100, 77.55.110, 77.55.140, 77.55.190, 77.55.200, and 77.55.290:
A person who is aggrieved or adversely affected by the following Department actions may request an informal review of:
   (A) The denial or issuance of a HPA, or the conditions or provisions made part of a HPA; or
   (B) An order imposing civil penalties.

It is recommended that an aggrieved party contact the Area Habitat Biologist and discuss the concerns. Most problems are resolved at this level, but if not, you may elevate your concerns to his/her supervisor. A request for an INFORMAL REVIEW shall be in WRITING to the Department of Fish and Wildlife, 600 Capitol Way North, Olympia, Washington 98501-1091 and shall be RECEIVED by the Department within 30-days of the denial or

issuance of a HPA or receipt of an order imposing civil penalties. The 30-day time requirement may be stayed by the Department if negotiations are occurring between the aggrieved party and the Area Habitat Biologist and/or his/her supervisor. The Habitat Protection Services Division Manager or his/her designee shall conduct a review and recommend a decision to the Director or its designee. If you are not satisfied with the results of this informal appeal, a formal appeal may be filed.

B. FORMAL APPEALS (WAC 220-110-350) OF DEPARTMENT ACTIONS TAKEN PURSUANT TO RCW 77.55.100 OR 77.55.140:
A person who is aggrieved or adversely affected by the following Department actions may request an formal review of:
   (A) The denial or issuance of a HPA, or the conditions or provisions made part of a HPA;
   (B) An order imposing civil penalties; or
   (C) Any other "agency action" for which an adjudicative proceeding is required under the Administrative Procedure Act, Chapter 34.05 RCW.

A request for a FORMAL APPEAL shall be in WRITING to the Department of Fish and Wildlife, 600 Capitol Way North, Olympia, Washington 98501-1091, shall be plainly labeled as "REQUEST FOR FORMAL APPEAL" and shall be RECEIVED DURING OFFICE HOURS by the Department within 30-days of the Department action that is being challenged. The time period for requesting a formal appeal is suspended during consideration of a timely informal appeal. If there has been an informal appeal, the deadline for requesting a formal appeal shall be within 30-days of the date of the Department's written decision in response to the informal appeal.

C. FORMAL APPEALS OF DEPARTMENT ACTIONS TAKEN PURSUANT TO RCW 77.55.110, 77.55.200, 77.55.230, or 77.55.290:
A person who is aggrieved or adversely affected by the denial or issuance of a HPA, or the conditions or provisions made part of a HPA may request a formal appeal. The request for FORMAL APPEAL shall be in WRITING to the Hydraulic Appeals Board per WAC 259-04 at Environmental Hearings Office, 4224 Sixth Avenue SE, Building Two - Rowe Six, Lacey, Washington 98504; telephone 360/459-6327.

D. FORMAL APPEALS OF DEPARTMENT ACTIONS TAKEN PURSUANT TO CHAPTER 393, LAWS OF 2003:
A person who is aggrieved or adversely affected by the denial or issuance of a HPA, or the conditions or provisions made part of a HPA may request a formal appeal. The FORMAL APPEAL shall be in accordance with the provisions of Chapter 393. The request for FORMAL APPEAL shall be in WRITING to the Environmental and Land Use Hearings Board.

E. FAILURE TO APPEAL WITHIN THE REQUIRED TIME PERIODS RESULTS IN FORFEITURE OF ALL APPEAL RIGHTS. IF THERE IS NO TIMELY REQUEST FOR AN APPEAL, THE DEPARTMENT ACTION SHALL BE FINAL AND UNAPPEALABLE.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

September 15, 2003

Reply To
Attn Of: ECO-083

Amended Water Quality Certification

CERCLA-
Pacific Sound Resources
Marine Sediment Unit
Mouth of Duwamish River/West Waterway
Elliott Bay, Seattle, Washington

Introduction. This Water Quality Certification (WQC) has been completed in support of remedial work to be conducted at the Pacific Sound Resources Superfund site. The Pacific Sound Resources (PSR) Site is located on the southern shore of Elliott Bay, Seattle, Washington. Specifically, the site lies west of the West Waterway (Duwamish River mouth) at 2801 S.W. Florida Street, Seattle, Washington. The site was used for wood treatment operations from 1909 to 1994, and was separated into two Operable Units for investigation and cleanup purposes. Upland Unit cleanup actions have included demolition of all on-site structures and removal of source material. Cleanup actions for the Marine Sediments Unit (MSU) will include removal (dredging) and containment of contaminants in the aquatic environment including, but not limited to, the confinement through capping of contaminated marine sediments. The dredging/capping actions are expected to be initiated in summer of 2003, with actual in-water construction beginning in fall of 2003 and being completed in non-continuous work phases by mid-February 2006.

Additionally, as a precursor to the sediment capping to be performed by the Environmental Protection Agency (EPA), the Port of Seattle (Port) was asked to remove creosote pilings and other above-water timbers attached to these pilings from the area to be capped. This action is scheduled to begin in July, 2003. The action supports and contributes to planned Remedial Action (in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended [CERCLA]) for PSR. The WQC for pilings removal is located in EPA's site file and copies have been distributed to all affected parties.

A copy of this WQC will be included in EPA's site file as part of the record for this action and provided to the Corps of Engineers, Seattle District, the Port, and all other contractors and subcontractors performing actual in-water work at the PSR site. EPA reserves the right and responsibility to revoke, amend, or revise this WQC at any time.

The Environmental Protection Agency (EPA) is responsible for review of this project to insure compliance with the substantive requirements of the Clean Water Act Section 401. The State of Washington water quality standards (Chapter 173-201 WAC) were drawn on heavily for EPA's evaluation, these standards being normally applicable and used by the State of Washington for Section 401 certification in the absence of a CERCLA action. Elliott Bay is a Class A waterbody per WAC 173-201A. The anti-degradation policy of the State of Washington, in addition to preservation of beneficial uses, is a major factor in our analysis.

Construction Activities.

EPA's ROD selected the remedy of dredging and capping of specific areas of Elliott Bay and the shoreline of the former PSR facility. The U.S. Army Corps of Engineers (Corps), through an interagency agreement with EPA Region 10, was assigned to assist in the design and execute the remedial actions for the PSR MSU. The Corps is the principal author of the PSR Management Guidelines (PSRMG), the key document that links the various actions described in a set of documents designated as the Design Documents. This set of documents collectively describes the methods to assure procedures to implement and document the EPA-selected remedy for the PSR MSU; to assure regulatory process is followed; and to monitor and report the status of the remediated site to EPA, the State of Washington and other stakeholders. For engineering purposes, the MSU cap area was subdivided according to specific site conditions and operational considerations that required different cap designs, cap materials specifications, or construction methods. The Design Documents describe this organization of the site into Remediation Areas (RA), the remedy actions to occur in each RA, sequencing, and the tentative schedule (table 1).

Table 1
Construction Sequencing and Tentative Schedule

Construction Element	Start	Finish
Dredge RA3	9/3/03	10/1/03
RA1 Cap Construction	9/2/03	2/13/04
Extend Longfellow Cr Outfall	10/3/03	2/13/04
RA3 Cap Construction	7/17/04	8/16/04
RA2a Cap Construction	8/17/04	10/1/04
RA5 Cap Construction, Phase I	1/17/04	2/15/05
RA2b Cap Construction	10/4/04	11/1/04
RA4 Cap Construction	11/2/03	2/13/04
RA5 Cap Construction, Phase II	7/17/05	2/13/06

More specific descriptions of the work involved are contained in the Design Documentation located in EPA's site file.

Certification. EPA certifies that the work proposed complies with applicable provisions of Sections 301, 302, 303, 306, and 307 of the Clean Water Act, as amended. This certification is subject to the following conditions:

1. Work in waters (e.g., whatever the activity is) pursuant to this action shall be completed prior to February 15, of any year up until the year 2006 when all work in waters for this action is expected to be completed; thereafter this WQC will expire.

2. Copies of this certification shall be kept on the job site and readily available for reference by EPA, the contractor, and other appropriate federal, state and local government inspectors. EPA retains the jurisdiction to make further modifications to this certification through written amendment if it appears necessary to protect the public interest.

3. Water quality standards (WQS) pertaining to the marine waters of Elliott Bay (Class A) shall apply to this project except in the authorized dilution zone.

A. Dredging. For this activity, the entire water area within 300 feet measured radially from the construction operation (i.e., dredge) is authorized as the dilution zone. If water quality monitoring is required it shall consist of dissolved oxygen, temperature, total suspended solids (TSS) measurements and turbidity observations. Observation reports and water quality data collected within and at the edge of the mixing zone for any reason shall be provided to EPA in a timely manner. At no time within any point of the dilution zone shall dissolved oxygen levels be caused to drop below 3.5 mg/l. Should this occur, all in-water activities should cease immediately and EPA notified. Work shall not recommence until dissolved oxygen levels have returned to ambient levels and approval given by EPA.

B. Capping. For this activity, the entire water area within 600 feet measured radially from the construction operation (i.e., dredge/barge) is authorized as the dilution zone. If water quality monitoring is required it shall consist of dissolved oxygen, temperature, total suspended solids (TSS) measurements and turbidity observations. Observation reports and water quality data collected within and at the edge of the mixing zone for any reason shall be provided to EPA in a timely manner. At no time within any point of the dilution zone shall dissolved oxygen levels be caused to drop below 3.5 mg/l. Should this occur, all in-water activities should cease immediately and EPA notified. Work shall not recommence until dissolved oxygen levels have returned to ambient levels and approval given by EPA.

Precautionary Note: Overlapping Mixing Zones. If more than one construction activity, either from this project or other construction/remediation projects, occurs at the same time, mixing zones may overlap. *In this situation, EPA should be consulted immediately to determine an appropriate monitoring strategy and to make necessary adjustments in definition of mixing zones while the multiple activities are occurring in the waterway.*

4. Care shall be taken to prevent any petroleum products or other deleterious or toxic materials from entering the water as a result of any activity. If a significant oil sheen is observed in the vicinity of the operation, immediate action must be taken to modify the activity and prevent further degradation, or the activity shall cease. EPA will be notified of the condition immediately.

5. If distressed or dying fish are observed in the vicinity of the operation, immediate action

must be taken to modify the activity and prevent further degradation, or the activity shall cease. EPA will be notified of the condition. Dead fish should be collected and appropriately preserved in the event that post-mortem tests or evaluations are necessary. EPA reserved the right to coordinate with Federal, State, and Tribal fish experts and require such tests.

6. Floatable debris introduced into Elliott Bay by the activities will be collected and suitably disposed at an upland location.

Monitoring Activities and Requirements. The overall objective of monitoring water quality is to assess compliance with WQS during dredging and cap construction operations. The specific objectives are to ensure dissolved oxygen concentrations do not fall below prescribed minimums, construction activities are accomplished in a manner ensuring protection of the environment, and to document constituents of interest.

The monitoring approach stipulated by this WQC is a tiered one, with monitoring requirements premised on the detected constituents of interest which relates to the degree of risk associated with dredging. The monitoring requirements are initially severe in order to detect potentially adverse effects so that appropriate and necessary corrective actions may be taken early in the dredging operation. An exceedence of water quality standards could result in corrective action depending upon the degree of the exceedence and/or the risk posed by the exceedence to beneficial uses of the water body. Generally, EPA will use these data for decisions on curtailing or continuing the monitoring, adjusting sampling locations modifying dredging operations, or recalculating a dilution zone.

GENERAL

1. Specified conventional parameters will be monitored in the vicinity of each dredging and cap construction operation as specified. All results will be faxed to EPA as soon as they become available (Attn. John Malek, FAX: (206) 553-1775).

2. Daily monitoring will involve at least two collection times that correspond with (1) slack and (2) strong ebb and/or flood tidal conditions for the first three days of each separable construction operation, e.g., first lift of cap, second lift, etc. After 3 days of monitoring, if no water quality problems have arisen, monitoring intensity will be reduced to weekly or eliminated at the direction of EPA. Observation of persistent turbidity plumes from any operation will trigger an immediate monitoring event.

3. All monitoring will be conducted (1) at the dilution zone boundary; (2) at a mid-point within the dilution zone, and (3) at a reference location(s) outside the dilution zone and potentially outside of the waterway (***only if a reference approach is used***).

4. At each dredging monitoring location, water samples shall be taken at the near surface (approximately 3.0 feet below waterline), mid-depth, and near bottom (approximately 3.0 feet above the bottom). Samples shall be adjusted within the depth range to target the turbidity plume, which *may be, but is not required to be,* tracked hydro-acoustically. If no distinct turbidity plume can be identified, water samples shall be taken in the area

immediately down current of the dominant flow (tidal or river-influenced) and shall be obtained at the standard depths (i.e., surface, mid-depth, and near bottom).

5. When conventional monitoring is required, the parameters include:

   (1) Dissolved Oxygen (DO)
   (2) Temperature
   (3) Total Suspended Solids (TSS)
   (4) Turbidity

   If DO is determined by a field instrument rather than the Winkler method, calibration of the instrument and probe shall be performed across the range of DO levels likely to occur in the marine waters. Documentation of calibrations for DO or any other field instruments used for water quality measurements shall be included in the report sent to EPA.

6. The point of compliance with WQS will be those stations at the mixing zone boundary. Within the mixing zone, the Class standard for turbidity and temperature are waived, as are the acute criteria applicable to any identified chemicals-of-concern; none are identified for these actions. The Class standard for dissolved oxygen may be exceeded but shall not be caused to drop below 3.5 mg/l. All water quality standards are to be met outside of the authorized mixing zones. This waiver of specified standards within the mixing zones is intended for brief periods of time (such as a few hours) and is not an authorization to exceed those standards for the entire duration of construction. In no case does the waiver authorize degradation of water quality that significantly interferes with or becomes injurious to characteristic water uses or causes long-term harm to Elliott Bay.

7. ***Compliance standards for all dredging activities are the Marine Acute State of Washington water quality standards (Chapter 173-201 WAC).*** For conditions when the WQS are exceeded by the ambient water quality concentrations, the ambient water quality concentrations (as determined according to procedures and design approved by EPA) will serve as the performance criteria as designated in this document. Ambient values shall be reassessed based on re-sampling of the reference locations, during dredging operations as required in the above specification.

MONITORING LOCATIONS AND FREQUENCY.

1. Reference. (*A reference approach to water quality determinations may be, but is not required to be, used.*) Measured monitoring values may be compared to an ambient background condition. If this approach is followed, at least two days prior to initiating construction activities, ambient water quality will be determined for the conventional parameters. The ambient values can be determined by collecting and analyzing water samples collected at no less than three (3) stations in the area of the waterways but outside of the immediate construction areas. No more than two stations may be collected outside of the mouth of the waterway in Elliott Bay proper. At each station, three samples (top, bottom and mid-depth) must be collected following the requirements of

paragraphs 2 and 4 in the General section preceding. At least two rounds of sampling must be conducted. Results can be averaged for each strata (i.e., top, bottom, mid-) to determine ambient. Station locations and the individual sample data will be provided to EPA in addition to the averaged ambient values. Periodic reconfirmation of the ambient values can be conducted with advanced notification to EPA.

2. The contractor is responsible for preparation of a water quality monitoring plan that will specify locations and frequency for monitoring for each phase of dredging and capping activities for each RA. At the minimum, at each station, three samples (top, bottom and mid-depth) must be collected following the requirements of paragraphs 2 and 4 in the General section preceding. In general, the greater concern is for water quality effects to occur during dredging of the contaminated sediments. Four stations will be occupied for water quality monitoring. Two down-current (used relatively rather than absolutely) stations and one up-current station will be located at the mixing zone perimeter (300 feet). A random mid-point station (150 feet) will be occupied. Generally, the mid-point station should be located in proximity with the two down-current stations. At slack tides, the three perimeter stations can be randomly distributed along the compliance perimeter. Monitoring will occur at least twice daily per General paragraph 2 when dredging is occurring on at least an 8-hour shift for the first 3 days. Monitoring is not required when the dredge is shut down. If this intense monitoring shows no water quality exceedence, monitoring may be reduced to once daily. If after another 3 days of monitoring, no water quality exceedence occur, monitoring may be further reduced or terminated at the discretion of EPA.

   Capping efforts will necessarily suspend sediment particles throughout the water column. The impact of the initial capping material on the contaminated substrate is of most concern and a flexible and adaptive management approach to cap placement is anticipated. The monitoring plan should be designed to gather information on mixing and resuspension of the underlying contaminated sediment for the initial lift (i.e., until approximately a one foot cap layer develops) at each RA. Dissolved oxygen levels should be periodically (weekly) checked during active cap placement *near the bottom*, but are otherwise not required. Once an area (the entire RA or subareas depending on placement scenarios) has achieved a initial one foot of cover, no further compliance monitoring is required in that area. Visual observation monitoring will occur daily for persistent turbidity plumes. Evidence of problems with cap placement (i.e., through other monitoring actions) may trigger further water quality monitoring requirements.

Operational Response. If construction operations are found not to be in compliance with the provisions of this certification, or result in conditions causing distressed or dying fish, the operator shall immediately take the following actions:

1) Cease operations at the location of the violation.

2) Assess the cause of the water quality problem and take appropriate measures to correct the problem and/or prevent further environmental damage. EPA expects that when water quality problems with the conventional constituents are identified during monitoring, new

samples will be collected ***immediately*** using recalibrated instruments or more precise measurement methods to confirm the initial indication. Regardless of whether the second sample confirms the initial measurement, EPA will be notified of the instance. If the second sample does not confirm the initial measurement, construction may recommence with a third set of samples collected within 45 minutes of restart. Indications of a water quality problem in this third series will immediately trigger construction shut-down and notification to EPA. Construction will not be recommenced until specifically approved by EPA. It is strongly recommended that additional monitoring be initiated to determine the recovery time and attempt to determine the source of the problem.

3) In the event of finding distressed or dying fish, the operator shall collect fish specimens and water samples in the affected area and, within the first hour of such conditions, have the water samples analyzed for dissolved oxygen and total sulfides. EPA may require further such sampling and analyses before allowing the work to resume.

Notification. EPA shall be notified 5 days prior to initiation of construction and immediately upon any exceedence or failure to comply with conditions of this WQC. Copies of any monitoring reports will be provided to EPA in a timely fashion. Contact: John Malek, Sediment Management Program, at voice (206) 553-1286, or fax (206) 553-1775; Address: 1200 Sixth Ave., ECO-083, Seattle, Washington, 98101, E-mail: malek.john@epa.gov.

PREPARED AND APPROVED BY:

John Malek

John Malek
Sediment Management Program
Office of Ecosystems and Communities

15 Sept 2003
Date

cc:
EPA (Sally Thomas)
EPA (Justine Barton)
Corps (Miriam Gilmer-Bogh)
Ecology (Brendan McFarland, Loree Randall)
DNR (Peter Leon)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

Reply To
Attn Of: ECO-083

MEMORANDUM

SUBJECT: Pacific Sound Resource: Determination of the Suitability of Dredged Material from Federal Operations and Maintenance activities at the Lower Snohomish River Settling Basin and adjacent Navigation Channel for Capping Material

FROM: John Malek, Team Leader
Sediment Management Program
Aquatic Resources Unit

John Malek

TO: Sally Thomas, Remedial Project Manager

1. The Corps of Engineers intends to maintenance dredge up to 272,000 cubic yards of sediment from the lower Snohomish settling basin and the adjacent navigation channel (between 304+00 and 375+00), an authorized federal project, at Everett, Washington. As part of the Corps' approval process, the material was characterized pursuant to the guidance and requirements of the Dredged Material Management Program (DMMP), of which EPA is a member agency. The DMMP agencies completed and signed a Determination of Suitability, dated January 28, 2004, for the project (attached). The DMMP determination was for proposed disposal at the DMMP open water site in Port Gardner and/or for beneficial use. The primary record supporting the Determination of Suitability is located at the Seattle District office; however, copies of primary documents (e.g., Sampling and Analysis Plan and Data Report) are also filed in the Aquatic Resources Unit at the Region.

2. The remedy for the Pacific Sound Resources Superfund project includes construction of a sediment cap. The remedy anticipated that dredged material(s) determined to be suitable for construction of the cap remedy could become available during construction (either from Corps dredging projects or private projects permitted by the Corps) and should be able to be accepted and used by EPA for the selected remedy. (Appendix F of the *Final Design Submittal , Pacific Sound Resources Superfund Site, Marine Sediment Unit, Seattle Washington*, dated February 3, 2002 presents design drawing and example specifications to be used in construction of the sediment cap; material specification for Dredged Cap Material are provided in attachment F-1.) The characterization protocols used by the DMMP agencies to determine suitability for permit actions are appropriate for characterizations under Superfund, in this instance as capping material at the Pacific Sound Resources site. As appropriate permits/permissions must be secured to

dredge any sediments, EPA decided that the most efficient protocol would be to review such projects after such approvals are completed for suitability of the material for use with the Pacific Sound Resources remedy. No permit is needed for discharge at the Superfund site if the material is accepted by EPA. Clean dredged material (that meets the specifications for capping) would be placed as cap material, in accordance with the design plans under Corps oversight. Because barge loads of dredged material are not identical, the Corps may exclude or reject individual dredged material management units or barge loads.

3. EPA (Justine Barton) reviewed the characterization performed for the DMMP agencies leading to the DMMP Suitability of Determination. I have reviewed the DMMP determination and primary documents with regards to the type of material needed by EPA for use as cap material. Particular attention was paid to the grain size composition of the dredged material in addition to the chemical nature of the material. Based on this evaluation, I conclude that the dredged material from the Corps maintenance dredging project are suitable for use as cap material at the Pacific Sound Resources site and can be accepted for that purpose. It is noted that the dredged material management unit characterized by sample SNO-09 contains relatively more silt than the other units and may require special attention during placement.

Effective: April 27, 2004

Attachment

cc: Justine Barton, EPA
Corps DMMO(Lauren Cole-Warner)
Corps HTRW (Miriam Gilmer)
Corps Operations (Patty Miller)

CENWS-OD-TS-DM

MEMORANDUM FOR: RECORD

January 28, 2004

SUBJECT: DETERMINATION ON THE SUITABILITY OF PROPOSED FEDERAL OPERATIONS AND MAINTENANCE DREDGED MATERIAL FROM THE **LOWER SNOHOMISH RIVER SETTLING BASIN AND ADJACENT NAVIGATION CHANNELS** EVALUATED UNDER SECTION 404 OF THE CLEAN WATER ACT (CWA) FOR OPEN-WATER DISPOSAL AT THE PORT GARDNER NONDISPERSIVE DISPOSAL SITE AND/OR FOR BENEFICIAL USE.

1. Introduction. The following summary reflects the consensus determination of the Dredged Material Management Program (DMMP) Agencies' (U.S. Army Corps of Engineers, Department of Ecology, Department of Natural Resources, and the Environmental Protection Agency) with jurisdiction on dredging and disposal on the suitability of up to 272,000 cy of sediment from the lower settling basin and adjacent navigational channel between Stations 304+00 and 375+00. This federal maintenance material from the Lower Snohomish Navigation Channel in Everett, Washington is proposed to be disposed at the Port Gardner DMMP unconfined open-water disposal site or at an approved beneficial use site.

This determination of suitability for open-water disposal is based on the acceptability of the sampling conducted by Seattle District, Corps of Engineers contractors and subcontractors in September 2003 (Table 1). All relevant test data from this sampling event is contained in a report submitted by Anchor Environmental dated December 2003. These data were considered sufficient and acceptable for decision-making by the Agencies.

Table 1. Project Summary.

Time of proposed dredging	Fall – Winter 2004/2005
Proposed disposal sites	Port Gardner non-dispersive disposal site, or beneficial use
Sediment ranking	Low moderate, homogenous
Project last dredged	Stations 333+50 to 345+50: 15 Jan - 8 Feb 2001 Stations 304+00 to 324+00: Jan 2002

Table 2. Regulatory Tracking Table.

SAP received	September 2, 2003
SAP Approval date	September 22, 2003
Sampling date(s):	Sept. 23 - 25, 2003
Data report submittal date:	December 2003
DAIS Tracking #	EVEDS-1-A-F-190
Recency Determination Date: LM Concern (5-7 years)	Sept. 2008 – 2010

2. Background. The area proposed for maintenance dredging was last characterized in 1996 and dredged in 2002 (Table 1). Material from this portion of the Snohomish River navigation channel has been used previously for beneficial uses, including capping and for the Jetty Island habitat restoration project.

3. **Sampling**. The area proposed for dredging is ranked "low-moderate" by the DMMP agencies, based on previous test data. For low-moderate homogenous material, the DMMP requires a minimum of one field sample for each 8,000 cy and one laboratory analysis for each 40,000 cy. For the current characterization, 36 separate core samples were combined into 9 composites for analysis. Each analysis represented one DMMU of between 11,000 and 37,000 cy of material (see Table 3). Each DMMU met the requirement of dredging independence, such that the area represented by each sample could be dredged independently from surrounding DMMUs should they have different suitabilities for open water disposal or beneficial use.

Sampling took place on September 23-25, 2003 aboard the Corps vessel Puget. The approved SAP was followed. Thirty-six core samples were taken with a Vibracore sampler and processed on board the vessel. Material from each core was taken to the depth of the dredge prism and composited with other cores from a given DMMU. Material from the one-foot layer directly below the dredge prism was taken as a Z-sample for most cores and archived. No Z-samples were collected from 7 out of 36 samples due to core refusal short of the target sampling depth.

4. **Conventional and Chemical Analysis**. The Agencies' approved sampling and analysis plan was followed, and quality assurance/quality control guidelines specified by PSEP and the DMMP program were generally complied with. Conventional (Table 3) and chemical analyses (Appendix A) were performed by Columbia Analytical Services (CAS) of Kelso, Washington. Chemical analysis results demonstrated that there were no detected or non-detected SL exceedances of any DMMP chemical of concern in any sample. Also, because this material has been proposed for use as capping material, it was tested for Atterberg limits--a test used to estimate strength and settling characteristics. All material tested was found to be "non-plastic" by the Atterberg limit testing.

All data complied with general QA/QC requirements of the DMMP (Table 4) and were acceptable as qualified by the laboratory.

Table 3. Conventional Results, Lower Snohomish Settling Basin, DY 2004.

Parameter		S1	S2	S3	S4	S5	S6	S7	S8	S9
Depth Interval		0-4.7 ft	0-8.4 ft	0-11.9 ft	0-10.1 ft	0-7.8 ft	0-6.4 ft	0-4.2 ft	0-5.3 ft	0-5 ft
Volume, cubic yards		11,360	36,550	35,430	36,990	32,620	23,910	24,740	35,800	33,810
Grain Size (%)	Gravel	0.6	0.9	0.5	0.4	0.2	0.3	0.1	0.1	1.1
	Total Sand	76.4	71.5	81.3	67.6	60.0	64.4	58.4	53.9	48.3
	Silt	15.8	21.2	12.7	23.1	31.5	26.2	33.8	36.2	41.8
	Clay	5.0	7.0	5.2	7.9	8.0	8.1	7.1	9.0	8.7
	Fines (silt + clay)	20.8	28.2	17.9	31.0	39.5	34.3	40.9	45.2	50.5
Total Organic Carbon (%)		0.6 J	1.4 J	2.48	1.19	1.94	1.42	1.44	4.55	2.71
Total solids (%)		75.7	65.2	66.5	63	59.3	66.3	62.2	61.4	58.1
Total volatile solids (%)		2.34	6.19	4.6	5.36	6.15	4.4	5.31	5.47	6.2
N-Ammonia (mg/kg)		26	48	41	57	52	52	48	49	42
Sulfide (mg/kg)		0.9	173	43 J	158 J	480	118	190	127	0.9 U

Table 4. QA/QC Warning and Action Limits (DMMP Program).

	QA Element	Warning Limits	Action Limits
Precision	Metals	None	20% RPD or COV
	Organics	35% RPD or COV	50% COV or a factor of 2 for duplicates
Matrix Spikes	Metals	None	75-125% recovery
	Organics: Volatiles Semivolatiles and Pesticides	70-150% 50-150%	None (however, zero percent recovery may be cause for data rejection)
Reference Materials	Metals	None	95% CI if specified for a particular CRM; 80-120% recovery if not.
	Organics	None	95% CI for CRMs. No action limit for uncertified RMs.
Surrogate Spikes	Volatiles	85% minimum recovery	EPA CLP chemical-specific recovery limits
	Pesticides	60% minimum recovery	
	Semi-volatiles	50% minimum recovery	

5. Comparison to SMS Guidelines. All results of the chemical analyses were organic carbon normalized, if necessary, and compared to Washington State Sediment Management Standards (Appendix B). This analysis showed that levels of all detected and most undetected contaminants were below the Sediment Quality Standards (SQS) set by Washington State. One chemical (hexachlorobenzene) was not detected, but the organic carbon normalized detection limit in one sample (0.47 mg/kg OC) was slightly above the SQS guidelines (0.38 mg/kg OC). This occurred in SNO-1, with the lowest total organic carbon concentration (0.6%) of all project samples. This apparent exceedance was likely caused by the low organic carbon concentration as well as a general difficulty for achieving low detection limits for HCB. The DMMP agencies agreed that there is no reason to believe that this non-detected chemical is present at any level of concern. Thus, this analysis indicates that all sediments tested are suitable for beneficial uses under Washington State Sediment Management Standards, including use as cap material.

6. Suitability. This memorandum documents the suitability of proposed dredged sediments from the lower Snohomish settling basin and adjacent navigation channel for disposal at a DMMP open-water disposal site, or at an approved beneficial use site. The data gathered were deemed sufficient and acceptable for regulatory decision-making under the DMMP program. Based on the results of the previously described testing, the DMMP agencies concluded that all **271,210 cy are suitable** for open water disposal. This determination of suitability does not preclude the consideration of this material for an appropriate beneficial use. It does not constitute final agency approval of the project. During the public comment period that follows a public notice, the resource agencies will provide input on the overall project. A final decision will be made after full consideration of agency input, and after an alternatives analysis is done under section 404(b)(1) of the Clean Water Act.

7. References.

Anchor Environmental 2003. Data Report: Sediment characterization results for the Lower Snohomish River settling basin and adjacent navigation channels. Prepared for the Seattle District, US Army Corps of Engineers, December 2003.

Concur:

1/28/04
Date

Lauran Cole Warner, Seattle District Corps of Engineers

2/5/04
Date

Justine Barton, Environmental Protection Agency

2/5/04
Date

Tom Gries, Washington Department of Ecology

2/5/2004
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DMMO file

APPENDIX A

Lower Snohomish chemical results compared to DMMP guidelines

	SL	BT	ML	SNO-1	SNO-2	SNO-3	SNO-4	SNO-5	SNO-6	SNO-7	SNO-8	SNO-9
Metals (mg/kg)												
Antimony	150	–	200	0.09 N	0.11 N	0.13 N	0.13 N	0.14 N	0.13 N	0.16 N	0.15 N	0.17 N
Arsenic	57	507.1	700	6.4	6.9	6.6	7.4	11.1	7.9	10	11	10.7
Cadmium	5.1	11.3	14	0.19	0.18	0.15	0.18	0.23	0.18	0.19	0.2	0.24
Chromium	–	267	–	25.8 N	28.7 N	30.5 N	32.5 N	32.8 N	35.6 N	34.1 N	36.7 N	35.3 N
Copper	390	1027	1300	20.3	22.5	24.9	28.3	30.8	28.7	33.6	35	36
Lead	450	975	1200	4.69	6.5	6.39	7.05	8.95	7	9.42	9.52	9.59
Mercury	0.41	1.5	2.3	0.03	0.05	0.05	0.06	0.05	0.04	0.08	0.06	0.06
Nickel	140	370	370	24.7	27.5	28.4	30.9	30.8	32.1	32.5	33.7	34.6
Selenium	–	3	–	0.5 B	0.6 B	0.4 B	0.3 B	0.4 B	0.4 B	0.6 B	0.8	1.1
Silver	6.1	6.1	8.4	0.05	0.07	0.06	0.08	0.1	0.08	0.1	0.11	0.11
Zinc	410	2783	3800	35 N	38.4 N	42.7 N	45.1 N	51.9 N	46.3 N	50.2 N	49.5 N	51.2 N
Tributyltin (µg/l porewater)	0.15	0.15	–	0.046 U	0.024 U	0.045 U	0.025 U	0.02 U	0.023 U	0.02 U	0.02 U	0.02 U
LPAHs (µg/kg-DW)												
Total LPAH	5200	–	29000	4.2	37	45.8	39.2	33.7	49.6	56.4	47.1	60.4
Naphthalene	2100	–	2400	10 U	10	9.2 J	4.9 J	4.2 J	8.8 J	8 J	7 J	9.1 J
Acenaphthylene	560	–	1300	10 U	2.7 J	10 U	10 U	10 U	9.8 U	9.9 U	11 U	10 U
Acenaphthene	500	–	2000	10 U	3.7 J	6 J	4.6 J	4.3 J	6.3 J	8.8 J	5 J	8.9 J
Fluorene	540	–	3600	10 U	3.4 J	5.2 J	5 J	4.4 J	5.8 J	6.6 J	5.1 J	7.1 J
Phenanthrene	1500	–	21000	2 J	13	19	19	16	23	22	15	26
Anthracene	960	–	13000	2.2 J	4.2 J	6.4 J	5.7 J	4.8 J	5.7 J	11	15	9.3 J
2-Methylnaphthalene	670	–	1900	10 U	2.5 J	3.6 J	10 U	10 U	4.3 J	3.4 J	2.5 J	3.7 J
HPAHs (µg/kg-DW)												
Total HPAH	12000	–	60000	19.5	100.9	119.3	100.6	121.4	137.9	138.5	102.9	236.1
Fluoranthene	1700	4600	30000	7.6 J	25	35	23	25	42	33	25	60
Pyrene	2600	11980	16000	6.9 J	23	31	20	27	38	28	22	53
Benzo(a)anthracene	1300	–	5100	2.6 J	9.1 J	8.8 J	8.8 J	11	8.2 J	12	11 J	29
Chrysene	1400	–	21000	2.4 J	12	11	13	16	30	22	12	29
Total benzofluoranthenes	3200	–	9900	10 U	14.6	17.4	18.8	22	13.5	22	16.7	35
Benzo(a)pyrene	1600	–	3600	10 U	7.4 J	7.5 J	7.8 J	9.4 J	6.2 J	10	7.9 J	16
Indeno(1,2,3-cd)pyrene	600	–	4400	10 U	4.5 J	4.4 J	4.4 J	5.4 J	9.8 U	6.3 J	4.2 J	7.6 J
Dibenzo(a,h)anthracene	230	–	1900	10 U	9.9 U	10 U	10 U	10 U	9.8 U	9.9 U	11 U	10 U
Benzo(g,h,i)perylene	670	–	3200	10 U	5.3 J	4.2 J	4.8 J	5.6 J	9.8 U	5.2 J	4.1 J	6.5 J
Chlorinated Hydrocarbons (µg/kg-DW)												
1,3-Dichlorobenzene	170	–	–	10 U	9.9 U	10 U	10 U	10 U	9.8 U	9.9 U	11 U	10 U
1,4-Dichlorobenzene	110	–	120	10 U	9.9 U	10 U	10 U	10 U	9.8 U	9.9 U	11 U	10 U
1,2-Dichlorobenzene	35	–	110	10 U	9.9 U	10 U	10 U	10 U	9.8 U	9.9 U	11 U	10 U
1,2,4-Trichlorobenzene	31	–	64	2 U	2.4 U	2.3 U	2.4 U	2.6 U	2.3 U	2.6 U	2.5 U	2.6 U
Hexachlorobenzene	22	168	230	2.8 U	3.3 U	3.2 U	3.4 U	3.6 U	3.2 U	3.4 U	3.5 U	3.7 U
Phthalates (µg/kg-DW)												
Dimethylphthalate	1400	–	–	10 U	9.9 U	10 U	10 U	10 U	9.8 U	9.9 U	11 U	10 U
Diethylphthalate	1200	–	–	10 U	9.9 U	10 U	10 U	10 U	9.8 U	9.9 U	11 U	10 U
Di-n-butylphthalate	5100	–	–	10 U	9.9 U	10 U	10 U	10 U	9.8 U	9.9 U	11 U	10 U
Butylbenzylphthalate	970	–	–	10 U	9.9 U	10 U	10 U	10 U	9.8 U	9.9 U	11 U	3.1 J
bis(2-Ethylhexyl)phthalate	8300	–	–	7.3 J	15 J	17 J	11 J	18 J	14 J	7.3 J	18 J	14 J
Di-n-octylphthalate	6200	–	–	10 U	9.9 U	10 U	10 U	10 U	9.8 U	9.9 U	11 U	10 U

Lower Snohomish chemical results compared to DMMP guidelines

	SL	BT	ML	SNO-1	SNO-2	SNO-3	SNO-4	SNO-5	SNO-6	SNO-7	SNO-8	SNO-9
Phenols (µg/kg-DW)												
Phenol	420	--	1200	15 J	70	38	23 J	29 J	28 J	47	19 J	35
2-Methylphenol	63	--	77	10 U	9.9 U	10 U	10 U	10 U	9.8 U	9.9 U	11 U	10 U
4-Methylphenol	670	--	3600	10 U	27	42	23	51	46	30	13	13
2,4-Dimethylphenol	29	--	210	7.3 U	8.5 U	8.3 U	8.8 U	9.3 U	8.3 U	8.9 U	9 U	9.5 U
Pentachlorophenol	400	504	690	50 U	50 U	50 U	50 U	50 U	49 U	50 U	51 U	35 J
Miscellaneous (µg/kg-DW)												
Benzyl alcohol	57	--	870	10 U	9.9 U	12	8.4 J	13	9.8 U	9.9 U	6.9 J	14
Benzoic acid	650	--	760	200 U	200 U	200 U	200 U	200 U	200 U	200 U	210 U	200 U
Dibenzofuran	540	--	1700	10 U	2.6 J	3.1 J	2.9 J	2.9 J	3.8 J	4.3 J	3.2 J	4.3 J
Hexachloroethane	1400	--	14000	10 U	9.9 U	10 U	10 U	10 U	9.8 U	9.9 U	11 U	10 U
Hexachlorobutadiene	29	--	270	10 U	9.9 U	10 U	10 U	10 U	9.8 U	9.9 U	11 U	10 U
n-Nitrosodiphenylamine	28	--	130	10 U	9.9 U	10 U	10 U	10 U	9.8 U	9.9 U	11 U	10 U
Volatiles (µg/kg-DW)												
Ethylbenzene	10	--	50	6.5 U	7.6 U	7.5 U	7.9 U	8.4 U	7.5 U	8.1 U	8 U	8.7 U
Tetrachloroethene	57	--	210	6.5 U	7.6 U	0.92 J	1.1 J	8.4 U	7.5 U	0.82 J	8 U	8.7 U
Trichloroethene	160	--	1600	6.5 U	7.6 U	7.5 U	7.9 U	8.4 U	7.5 U	8.1 U	8 U	8.7 U
Xylene (total)	40	--	160	6.5 U	7.6 U	7.5 U	7.9 U	8.4 U	7.5 U	8.1 U	8 U	8.7 U
Pesticides (µg/kg-DW)												
DDT (total)	6.9	50	69	0.86 U	0.97 U	0.91 U	1 U	2.7	2.13	0.96 U	2.2	1.2
4,4'-DDD	--	--	--	0.86 U	0.97 U	0.91 U	1 U	1.1 U	0.23 J	0.96 U	0.98 U	1.2
4,4'-DDE	--	--	--	0.86 U	0.97 U	0.91 U	1 U	1.1 U	0.91 U	0.96 U	0.98 U	1.1 U
4,4'-DDT	--	--	--	0.86 U	0.97 U	0.91 U	1 U	2.7	1.9 P	0.96 U	2.2 P	1.1 U
Aldrin	10	--	--	0.86 U	0.97 U	0.91 U	1 U	1.1 U	0.91 U	0.96 U	0.98 U	1.1 U
Dieldrin	10	--	--	0.86 U	0.97 U	0.91 U	1 U	1.1 U	0.91 U	0.96 U	0.98 U	1.1 U
gamma-BHC (Lindane)	10	--	--	0.86 U	0.97 U	0.91 U	1 U	0.31 JP	0.91 U	0.96 U	0.98 U	1.1 U
Total chlordane (DMMP)	10	37	--	0.86 U	1.2 U	0.91 U	0.13	1.78	0.91 U	0.32	0.19	0.23
Heptachlor	10	--	--	0.86 U	1.2 U	0.91 U	1 U	1.1 U	0.91 U	0.96 U	0.98 U	1.1 U
PCBs (µg/kg-DW)												
Aroclor 1016	--	--	--	8.6 U	9.7 U	9.1 U	10 U	11 U	9.1 U	9.6 U	9.8 U	11 U
Aroclor 1221	--	--	--	18 U	20 U	19 U	20 U	21 U	19 U	20 U	20 U	21 U
Aroclor 1232	--	--	--	8.6 U	9.7 U	9.1 U	10 U	11 U	9.1 U	9.6 U	9.8 U	11 U
Aroclor 1242	--	--	--	8.6 U	9.7 U	9.1 U	10 U	11 U	9.1 U	9.6 U	9.8 U	11 U
Aroclor 1248	--	--	--	8.6 U	9.7 U	9.1 U	10 U	11 U	9.1 U	9.6 U	9.8 U	11 U
Aroclor 1254	--	--	--	8.6 U	9.7 U	9.1 U	10 U	11 U	9.1 U	9.6 U	9.8 U	11 U
Aroclor 1260	--	--	--	8.6 U	9.7 U	9.1 U	10 U	11 U	9.1 U	9.6 U	9.8 U	11 U
Total PCBs	--	--	--	18 U	20 U	19 U	20 U	21 U	19 U	20 U	20 U	21 U
PCBs/Pesticides (mg/kg-OC)												
alpha-BHC	--	10	--	0.14 U	0.07 U	0.04 U	0.08 U	0.06 U	0.06 U	0.07 U	0.02 U	0.04 U
Total PCBs	--	38	--	3 U	1.43 U	0.77 U	1.68 U	1.08 U	1.34 U	1.39 U	0.44 U	0.77 U

Notes:

- U: The compound was analyzed for, but not detected ("Non-detect") at or above the method detection limit (MDL).
- J: The result is an estimated concentration based on either a laboratory quality control sample exceedence, or the reported concentration is less than the method reporting limit (MRL) but greater than the MDL.
- DW: Dry weight
- OC: Organic carbon
- 2-Methylnaphthalene is not added to other LPAHs as part of the total LPAH levels.

APPENDIX B

Lower Snohomish chemical results compared to SMS guidelines	SQS	CSL	SNO-1	SNO-2	SNO-3	SNO-4	SNO-5	SNO-6	SNO-7	SNO-8	SNO-9
Metals (mg/kg)											
Arsenic	57	93	6.4	6.9	6.6	7.4	11.1	7.9	10	11	10.7
Cadmium	5.1	6.7	0.19	0.18	0.15	0.18	0.23	0.18	0.19	0.2	0.24
Chromium	260	270	25.8 N	28.7 N	30.5 N	32.5 N	32.8 N	35.6 N	34.1 N	36.7 N	35.3 N
Copper	390	390	20.3	22.5	24.9	28.3	30.8	28.7	33.6	35	36
Lead	450	530	4.69	6.5	6.39	7.05	8.95	7	9.42	9.52	9.59
Mercury	0.41	0.59	0.03	0.05	0.05	0.06	0.05	0.04	0.08	0.06	0.06
Silver	6.1	6.1	0.05	0.07	0.06	0.08	0.1	0.08	0.1	0.11	0.11
Zinc	410	960	35 N	38.4 N	42.7 N	45.1 N	51.9 N	46.3 N	50.2 N	49.5 N	51.2 N
Phenols (µg/kg)											
Phenol	420	1200	15 J	70	38	23 J	29 J	28 J	47	19 J	35
2-Methylphenol	63	63	10 U	9.9 U	10 U	10 U	10 U	9.8 U	9.9 U	11 U	10 U
4-Methylphenol	670	670	10 U	27	42	23	51	46	30	13	13
2,4-Dimethylphenol	29	29	7.3 U	8.5 U	8.3 U	8.8 U	9.3 U	8.3 U	8.9 U	9 U	9.5 U
Pentachlorophenol	360	690	50 U	50 U	50 U	50 U	50 U	49 U	50 U	51 U	35 J
Miscellaneous (µg/kg)											
Benzyl alcohol	57	73	10 U	9.9 U	12	8.4 J	13	9.8 U	9.9 U	6.9 J	14
Benzoic acid	650	650	200 U	200 U	200 U	200 U	200 U	200 U	200 U	210 U	200 U
Organic Carbon Normalized											
LPAHs (mg/kg-OC)											
Total LPAH	370	780	0.7	2.64	1.85	3.29	1.74	3.49	3.92	1.04	2.23
Naphthalene	99	170	1.67 U	0.71	0.37 J	0.41 J	0.22 J	0.62 J	0.56 J	0.15 J	0.34 J
Acenaphthylene	66	66	1.67 U	0.19 J	0.4 U	0.84 U	0.52 U	0.69 U	0.69 U	0.24 U	0.37 U
Acenaphthene	16	57	1.67 U	0.26 J	0.24 J	0.39 J	0.22 J	0.44 J	0.61 J	0.11 J	0.33 J
Fluorene	23	79	1.67 U	0.24 J	0.21 J	0.42 J	0.23 J	0.41 J	0.46 J	0.11 J	0.26 J
Phenanthrene	100	480	0.33 J	0.93	0.77	1.6	0.82	1.62	1.53	0.33	0.96
Anthracene	220	1200	0.37 J	0.3 J	0.26 J	0.48 J	0.25 J	0.4 J	0.76	0.33	0.34 J
2-Methylnaphthalene	38	64	1.67 U	0.18 J	0.15 J	0.84 U	0.52 U	0.3 J	0.24 J	0.05 J	0.14 J
HPAHs (mg/kg-OC)											
Total HPAH	960	5300	3.25	7.21	4.81	8.45	6.26	9.71	9.62	2.26	8.71
Fluoranthene	160	1200	1.27 J	1.79	1.41	1.93	1.29	2.96	2.29	0.65	2.21
Pyrene	1000	1400	1.15 J	1.64	1.25	1.68	1.39	2.68	1.94	0.48	1.96
Benzo(a)anthracene	110	270	0.43 J	0.65 J	0.35 J	0.74 J	0.57	0.58 J	0.83	0.24 J	1.07
Chrysene	110	460	0.4 J	0.86	0.41	1.09	0.82	2.11	1.53	0.26	1.07
Benzo(a)pyrene	99	210	1.67 U	0.53 J	0.3 J	0.66 J	0.48 J	0.44 J	0.69	0.17 J	0.59
Indeno(1,2,3-cd)pyrene	34	88	1.67 U	0.32 J	0.18 J	0.37 J	0.28 J	0.69 U	0.44 J	0.09 J	0.28 J
Dibenzo(a,h)anthracene	12	33	1.67 U	0.71 U	0.4 U	0.84 U	0.52 U	0.69 U	0.69 U	0.24 U	0.37 U
Benzo(g,h,i)perylene	31	78	1.67 U	0.38 J	0.17 J	0.4 J	0.29 J	0.69 U	0.36 J	0.09 J	0.24 J
Total benzofluoranthenes	230	450	1.67 U	1.04	0.7	1.58	1.13	0.95	1.53	0.37	1.29
Chlorinated Hydrocarbons (mg/kg-OC)											
1,4-Dichlorobenzene	3.1	9	1.67 U	0.71 U	0.4 U	0.84 U	0.52 U	0.69 U	0.69 U	0.24 U	0.37 U
1,2-Dichlorobenzene	2.3	2.3	1.67 U	0.71 U	0.4 U	0.84 U	0.52 U	0.69 U	0.69 U	0.24 U	0.37 U
1,2,4-Trichlorobenzene	0.81	1.8	0.33 U	0.17 U	0.09 U	0.2 U	0.13 U	0.16 U	0.17 U	0.05 U	0.1 U
Hexachlorobenzene	0.38	2.3	0.47 U	0.24 U	0.13 U	0.29 U	0.19 U	0.23 U	0.24 U	0.08 U	0.14 U

Lower Snohomish chemical results compared to SMS guidelines

	SQS	CSL	SNO-1	SNO-2	SNO-3	SNO-4	SNO-5	SNO-6	SNO-7	SNO-8	SNO-9
Phthalates (mg/kg-OC)											
Dimethylphthalate	53	53	1.67 U	0.71 U	0.4 U	0.84 U	0.52 U	0.69 U	0.69 U	0.24 U	0.37 U
Diethylphthalate	61	110	1.67 U	0.71 U	0.4 U	0.84 U	0.52 U	0.69 U	0.69 U	0.24 U	0.37 U
Di-n-butylphthalate	220	1700	1.67 U	0.71 U	0.4 U	0.84 U	0.52 U	0.69 U	0.69 U	0.24 U	0.37 U
Butylbenzylphthalate	4.9	64	1.67 U	0.71 U	0.4 U	0.84 U	0.52 U	0.69 U	0.69 U	0.24 U	0.11 J
bis(2-Ethylhexyl)phthalate	47	78	1.22 J	1.07 J	0.69 J	0.92 J	0.93 J	0.99 J	0.51 J	0.4 J	0.52 J
Di-n-octylphthalate	58	4500	1.67 U	0.71 U	0.4 U	0.84 U	0.52 U	0.69 U	0.69 U	0.24 U	0.37 U
Miscellaneous (mg/kg-OC)											
Dibenzofuran	15	58	1.67 U	0.19 J	0.12 J	0.24 J	0.15 J	0.27 J	0.3 J	0.07 J	0.16 J
Hexachlorobutadiene	3.9	6.2	1.67 U	0.71 U	0.4 U	0.84 U	0.52 U	0.69 U	0.69 U	0.24 U	0.37 U
n-Nitrosodiphenylamine	11	11	1.67 U	0.71 U	0.4 U	0.84 U	0.52 U	0.69 U	0.69 U	0.24 U	0.37 U
PCBs (mg/kg-OC)											
Total PCBs	12	65	3 U	1.43 U	0.77 U	1.68 U	1.08 U	1.34 U	1.39 U	0.44 U	0.77 U

Notes:

- N: for metals: the matrix spike sample recovery is not within control limits.
- U: The compound was analyzed for, but not detected ("Non-detect") at or above the method detection limit (MDL).
- DW: Dry weight
- OC: Organic carbon
- Shaded hexachlorobenzene value exceeds SMS criteria; see text for details

FY 2005-2009 Maintenance Dredging, Snohomish River Navigation Channel and the Downstream and Upstream Settling Basins

Everett, Snohomish County, Washington

Substantive Compliance with Clean Water Act Section 404 and Section 10 of the Rivers and Harbors Act

1. **Introduction.** The purpose of this document is to record the U.S. Army Corps of Engineer's (Corps') evaluation and findings regarding this Operations and Maintenance (O&M) dredging project pursuant to Section 404 of the Clean Water Act (CWA) and Section 10 of the Rivers and Harbors Act (RHA).

   The action covered by this document is maintenance dredging and disposal activities proposed by the Corps for fiscal years 2005 though 2009 (October 1, 2004 through September 30, 2009). The maintenance dredging would occur in the downstream and upstream settling basins and adjacent portions of the navigation channel within the lower Snohomish River. Disposal of the sediments dredged in fiscal year 2005 would occur at several sites, including approved disposal sites at the Port of Everett Riverside Business Park site along the lower Snohomish River, use of the sediments as clean capping material for the U.S. Environmental Protection Agency's (EPA) remedial actions for the offshore Marine Sediments Unit (MSU) within the Pacific Sound Resources (PSR) Superfund Site in Elliott Bay, and open water disposal of sediments at the Washington Department of Natural Resources (WDNR) managed Puget Sound Dredged Disposal Analysis (PSSDA) open-water, non-dispersive disposal site in Port Gardner Bay.

   During fiscal years 2006 through 2009, dredged sediments may also be used for renourishment of Jetty Island in Port Gardner Bay or as clean fill at several previously used upland sites along the lower Snohomish River, including, but not limited to, the Langus Riverfront Park Rehandling site, the Kimberly Clark Log Yard site, and the Baywood site. These sites have historically served as disposal sites and their future use is dependent upon the need for materials at these sites, the availability of suitable material within the settling basins, and the availability of permits. The evaluation of sediment disposal at these sites will follow the same procedures as the evaluation of the fiscal year 2005 disposal actions and will be in compliance with Sections 404 and 401 of the Clean Water Act, as well as Section 7 of the Endangered Species. A detailed supplement to this evaluation (as well as to the Environmental Assessment) would be prepared if the Corps specifically pursues these disposal site options during the fiscal years 2006 through 2009 time period.

   This document addresses the substantive compliance issues from the Clean Water Act 404(b)(1) Guidelines [40 CFR §230.12(a) and the Regulatory Programs of the Corps of Engineers [33 CFR §320.4(a)].

Disposal of dredged sediments at the PSSDA open water site in Port Gardner Bay and the use of dredged sediments as capping material for the PSR Superfund site in Elliott Bay have previously been evaluated for compliance with Clean Water Act Section 404 and Section 10 of the Rivers and Harbors Act, as well as for compliance with Section 7 of the Endangered Species Act. The information contained in this document reflects the findings of the project record. Specific sources of information included the following:

PSR Superfund Site:

1. ESA Section 7 Informal Consultation and Essential Fish Habitat Consultation for cleanup of the Marine Sediments Unit of the Pacific Sound Resources (PSR) Superfund site. National Marine Fisheries Service concurrence letter to U.S. Environmental Protection Agency, dated March 20, 2003.

2. Endangered Species Act Section 7 Informal Consultation for the contaminated sediment cleanup of the Marine Sediments Unit of the Pacific Sound Resources (PSR) Superfund site. USFWS concurrence letter to U.S. Environmental Protection Agency, March 28, 2003.

3. Biological Assessment for the Pacific Sound Resources Superfund Site. December 2002 by Seattle District Corps of Engineers and U.S. Environmental Protection Agency.

4. Remedial Investigation, PSR Superfund Site. Seattle District Corps of Engineers, signed into the Record of Decision (ROD) on September 30, 1999.

5. Substantive Compliance with Clean Water Act Section 404 and Section 10 of the Rivers and Harbors Act, including 404(b)(1) evaluation. Seattle District Corps of Engineers, December 17, 2002.

PSSDA Open Water Disposal Site:

6. Essential Fish Habitat Consultation for the Puget Sound Dredged Disposal Analysis sites (PSSDA). National Marine Fisheries Service concurrence letter to U.S. Army Corps of Engineers, June 2, 2003.

7. ESA Section 7 Informal Consultation on the PSDDA Programmatic Biological Evaluation for non-dispersive disposal sites (WSB-99-235) and dispersive sites (WSB-99-592). National Marine Fisheries Service concurrence letter to U.S. Army Corps of Engineers, May 31, 2000.

8. ESA Section 7 Informal Consultation for PSDDA non-dispersive disposal sites in Pierce, King, Snohomish, and Whatcom Counties, Washington. USFWS concurrence letter to U.S. Army Corps of Engineers, May 17, 2000.

9. Programmatic Biological Evaluation for the Puget Sound Dredged Disposal Analysis (PSDDA) non-dispersive disposal sites. April 2000. Seattle District Corps of Engineers, Environmental Resources Section.

10. Final Environmental Impact Statement, Unconfined Open-Water Disposal for Dredged Material, Phase II (North and South Puget Sound). September 1989. Environmental Protection Agency Region 10, Seattle District Corps of Engineers, Washington Department of Natural Resources, and Washington Department of Ecology.

Dredging:

11. ESA Section 7 Informal Consultation and Essential Fish Habitat consultation for the proposed 2005-2009 Maintenance Dredging of the Snohomish River Navigation Channel. National Marine Fisheries Service concurrence letter to U.S. Army Corps of Engineers, dated October 31, 2003 and as amended via email on December 15, 2003.

12. ESA Section 7 Informal Consultation for the 2005-2009 Snohomish River Navigational Channel Maintenance Dredging. USFWS concurrence letter to U.S. Army Corps of Engineers, December 16, 2003.

13. Biological Assessment, FY 2004-2008 maintenance dredging of the Snohomish River navigation channel, lower and upstream settling basins, Everett, Washington. Dated September 29, 2003 with November 13, 2003 Memorandum amending proposed dredging dates to FY 2005 through 2009 and May 28, 2004 amendment proposing inclusion of Riverside Business Park site for disposal.

Riverside Disposal Site:

14. Draft Biological Evaluation, Riverside Business Park, Everett, Washington. March 18, 2004. Prepared for Reid Middleton and the Port of Everett by Pentec Environmental.

Jetty Island Renourishment:

15. Jetty Island Berm Renourishment Impact Study, Everett Washington. March 5, 2003. Prepared for the Port of Everett by Pentec Environmental.

16. Jetty Island eelgrass survey. 2001. Prepared for the Port of Everett by Pentec Environmental.

17. Biological Evaluation of the Jetty Island Habitat Renourishment. June 7, 2000. Prepared for the Port of Everett by Pentec Environmental.

18. Beneficial use of dredged materials, Jetty Island habitat development demonstration project: Year 5 monitoring report. 1996. Prepared for the Port of Everett by Pentec Environmental.

2. **Project Background.** Dredging of the mouth of the estuary and construction of Jetty Island by the Corps began in the late 1800's and early 1900's to facilitate the commercial navigation, timber related industries, and the industrial development that characterizes the lower river today. The consequence on the environment of these actions has been moderate degradation of the lower Snohomish River and estuary through a combination of levees, channelization, and the destruction of the intertidal habitats in the estuary, including the loss of approximately 50 percent of the area of intertidal mudflat (Pentec Environmental 1992).

   Dredging of the Snohomish River, adopted June 25, 1910 and modified by subsequent acts, consists of navigation channels, two settling basins, and dikes to serve navigation in Everett Harbor and Snohomish River. Specifically, the overall navigation project includes:

   (1) a one-mile channel from Puget Sound up the Snohomish River, 15 feet deep at mean lower low water (MLLW) and 150 to 425 feet wide.

   (2) an upper channel extending to river mile 6.3, 8 feet deep at MLLW and 150 feet wide.

   (3) two settling basins in the river channel;

      a. the downstream basin with 200,000 cubic yards (cy) capacity
      b. the upstream basin with 1 million cy capacity.

   Construction of the navigation channel in Everett Harbor from 1894 to 1903 resulted in large volumes of sediment requiring disposal. Creation of the Jetty Island began in 1903 with construction of a rock jetty behind which these dredged materials could be placed. Maintenance of the channel and placement of the dredged material to build the island continued until 1969 (Houghton 1995). In the 1980's the Corps and the Port of Everett (Port) realized an opportunity to demonstrate beneficial use of clean dredged material for habitat development. The Corps and the Port have increased the habitat and offset the natural erosion of Jetty Island by using dredged sediments renourish the island and to create a berm and protective embayment along the western side of the island.

3. **Project Need.** The need of the proposed maintenance dredging is to maintain a safe, reliable navigation channel for continued waterborne commerce on the Snohomish River and the Everett harbor. Without annual maintenance dredging of the settling basins and the navigation channel, shoaling would lead to a shallower navigation channel and would reduce the depth of the settling basins. This would reduce the ability of large ships to enter and leave the Port of Everett safely and would increase the need for dredging of the Everett harbor by public or private entities. Recreational use of the lower river by fishing and recreational vessels would also be compromised if the navigation channel were not maintained at a safe and predictable depth. This deterioration in the safety and reliability

of the navigation channel would negatively impact water-reliant commerce on the lower Snohomish River and within the surrounding communities in the greater Everett area. There is also a potential for loss of life from vessel accidents such as stranding, sinking, or collision with objects on the bottom if shifting and unpredictable shoals were allowed to persist within the lower river channel.

4. Project Purpose. The purpose of the proposed project is to maintain safe and reliable navigation within the lower Snohomish River by reducing the potential risks associated with shoaling in the navigation channel and settling basins.

5. Determination on the Availability of Less Environmentally Damaging Practicable Alternative to Meet the Project Purpose.

Several alternatives were evaluated to meet the project purpose.

a. **Alternative 1 (No Action).** The Corps would not dredge the lower Snohomish River navigation channel, or the upstream or downstream settling basins for the next five years. The settling basins would remain full and any additional material would shoal in these areas and also move further down stream and shoal within the navigation channel. The increased shoaling would reduce the ability of vessels to use the navigation channel.

b. **Alternative 2 (Dredge Navigation Channel and Settling Basins Alternate Years).** The Corps would perform dredging and disposal operations over the five-year time period, extending between fiscal years 2005 and 2009 in order to remove shoaled sediments from the navigation channel and settling basins. Dredging activities would alternate between the downstream and upstream basins (and their associated portions of the navigation channel) every other year after 2005 for the duration of this proposal (i.e. the downstream basin in 2006 and 2008; the upstream basin in 2007 and 2009). Both the downstream and upstream settling basins as well as the adjacent upstream portions of the navigation channel would be dredged in fiscal year 2005 because the annual dredging of the downstream basin was deferred from 2004. The dredging and disposal activities would be performed only between October 16 and February 14 of each fiscal year (or during other windows as may be determined by USFWS or NOAA Fisheries in the future) and would generally be accomplished within approximately three to four weeks.

c. **Alternative 3 (Dredge Channel and Both Settling Basins Every Year).** The Corps would perform dredging and disposal operations within the navigation channel and within both settling basins every year over the five-year time period of fiscal years 2005 through 2009. The dredging and disposal activities would be performed yearly between October 16 and February 14 of each fiscal year (or during other windows as may be determined by USFWS or NOAA Fisheries in the future). Under this alternative, yearly dredging would likely remove a smaller

volume of material from the channel and within each settling basin during each round of dredging than under Alternative 2.

d. **Alternative 4 (Dredge Only Shoals in the Navigation Channel).** The Corps would perform maintenance dredging and disposal operations only within the navigation channel, not within either of the settling basins. Dredging of the channel would be performed yearly between October 16 and February 14 (or during other windows as may be determined by USFWS or NOAA Fisheries in the future). Under this alternative, the entire length of the navigation channel would be dredged to remove shoals and the settling basins would continue to fill with sediments transported downstream by the river. Once the settling basins were completely filled, shoaling would be expected to increase within the navigation channel.

e. Findings. Alternative 1 would not maintain the federal navigation channel and settling basins in the lower Snohomish River and thus failed to meet the project purpose. The frequency of dredging in Alternative 3 is greater than that required by the project purpose to maintain a safe and reliable navigation channel. Alternative 3 would also be expected to have greater environmental effects due to the increased frequency of dredging activities within the action area. Alternative 4 would increase the scope of the project to encompass the entire navigation channel and would thus also have greater environmental effects due to the increased size of the action area. Alternative 4 also failed to meet the project purpose because it would not maintain the settling basins and would ultimately result in increased shoaling within the navigation channel.

The Corps has determined that Alternative 2 is the least environmentally damaging alternative that meets the project purpose of maintaining safe and reliable navigation in the lower Snohomish River. Alternative 2 would remove shoaled sediments over an appropriately sized project area to meet the project purpose, and does so at a frequency that is commensurate with the rate of shoaling within the river. While it is not part of the project purpose, Alternative 2 also reduces impacts to other aquatic ecosystems through the use of the dredged sediments as clean capping material for contaminated sediments in Elliott Bay (Seattle Washington) and by using the dredged sediments to renourish Jetty Island and thus maintain juvenile fisheries habitat in Port Gardner Bay (Everett Washington).

6. Determination on Significant Degradation, Either Individually or Cumulatively, To the Aquatic Environment.

a. Evaluation of Impacts on Ecosystem Function. The Corps has determined that dredging the navigation channel and settling basins will temporarily increase the cross-sectional area of the river in the dredged areas and would temporarily impact subtidal habitats within the channel and settling basins by the removal of shoaled sediments down to the authorized navigation depths. There will be no impact to

intertidal marsh, wetland, or riparian habitats, as dredging will take place only within the existing navigation channel and settling basins.

Dredging will temporarily reduce the populations of the benthic and epibenthic invertebrate community through removal of the benthic substrate and smothering as suspended sediments settle out of the water column. Invertebrate prey for juvenile salmonids and bottom fish will thus be temporarily reduced along the center-line of the dredged portions of the navigation channel and within the upstream and downstream settling basins. Total organic carbon could be slightly lower in the newly exposed sediments after dredging. Thus, the amount of food (in the form of organic matter) available for benthic invertebrates in these areas would be slightly reduced on a temporary basis.

While benthic and epibenthic prey species will be temporarily displaced, populations are expected to recover shortly (within one year) after dredging activities are completed. Because the dredging will occur only in a portion of the navigation channel and within the settling basins, adjacent undisturbed intertidal habitat along the edges of the dredged areas will continue to provide an established source of benthic and epibenthic invertebrates to colonize the newly disturbed subtidal substrate. Since new invertebrate communities will recolonize the dredging area, no long-term loss of biological productivity or prey base for juvenile salmonids or bottom fish is expected.

Disposal of the dredged sediments will also eliminate deeper subtidal invertebrate communities at the PSR Superfund site and PSSDA open water disposal site by smothering them. However, as with shallower benthic and epibenthic invertebrates within the navigation channel, recolonization from adjacent areas is expected within a relatively short timeframe (two to three years). If the dredged sediments are used to cap the contaminated sediments of the Marine Sediment Unit at the PSR Superfund site, the benthic invertebrate community in that area is expected to ultimately be restored and possibly improved through creation of cleaner benthic habitat. Thus, higher invertebrate diversity and abundance are expected in this area once exposure to contaminated sediments is reduced or eliminated through capping.

Therefore, although there will be temporary decreases in benthic and epibenthic prey within the dredging and disposal areas, this decrease is expected to cause an insignificant and discountable effect on local invertebrate populations in the action area and are not expected have adverse effects on listed fish species or adverse food web effects (as detailed in the 2005-2009 Biological Assessment, Corps 2003).

Important forage fish species such as Pacific herring and surf smelt are expected to avoid the dredging area, resulting in a temporary loss of forage fish from the immediate area during the dredging period. Sandlance could be entrained in the sediment ‘bites’ of the clamshell bucket or by the suction action of the hydraulic dredge during daytime dredging, but they are unlikely to be affected by dredge ‘bites’ that occur at night since these fish diurnally burrow into higher elevation beaches at night. Dredging and disposal activities are not expected to effect the spawning of

Pacific herring, surf smelt, or sand lance because there is no appropriate spawning habitat within the vicinity of the dredging or disposal activities. Forage fish are expected to immediately return to their usual foraging areas and behaviors after the dredging and disposal activities stop, thus no long-term loss of forage fish as a salmonid prey base or as food web support for birds or mammals is expected. Therefore, although there will be temporary disturbance to forage fish populations, coupled with temporary decreases in water quality surrounding the dredging and disposal operations, these are expected to be insignificant and discountable effects on local forage fish populations in the action area and are not expected have adverse effects on listed fish species through food web interactions (as detailed in the 2005-2009 Biological Assessment, Corps 2003).

Based on the operation of the clamshell dredge bucket, and the ability of salmonids and other mobile fishes to avoid entrainment in hydraulic dredges, the proposed dredging is not likely to entrain juvenile, sub-adult, or adult salmonids or other mobile fishes. The temporary increases in noise, turbidity, and water column disturbance during the dredging is expected to signal adult fish to avoid the area during dredging activities. Because the dredging is confined to the center of the navigation channel, adults can readily avoid the disturbed portion of the water column by moving toward the shoreline and either holding or transiting around the area being dredged. The proposed dredging is not likely to adversely affect adult salmonids if their upstream migration overlaps the dredging period. The proposed dredging and disposal activities have been timed so that few juvenile salmonids are expected to migrating through the waterway or using the adjacent shoreline habitats. If any early migrants are moving through the area during the period of dredging, they are likely to remain near the shoreline, thereby avoiding the disturbances associated with dredging in the main navigation channel.

Therefore, although there will be temporary increases in noise and disturbance, coupled with temporary decreases in water quality surrounding the dredging and disposal operations, these are expected to be insignificant and discountable effects on local fish populations in the action area and are not expected have adverse effects on listed fish species (see Section 5.5 for more details on federally listed fish species, and the 2005-2009 Biological Assessment, Corps 2003).

Sediment contaminate testing minimizes the potential resuspension or transport of contaminated sediments to other areas by preventing contaminated sediments from being disturbed during dredging. The proposed maintenance dredging is thus not expected to change the degree or nature of sediment contamination within the action area or to have an adverse effect on listed species (as detailed in the Biological Assessment, Corps 2003). By using the dredged sediments to cap the MSU of the PSR Superfund site, the Preferred Alternative would limit the mobilization, resuspension, transport, and biological accumulation of existing contaminated sediments in Elliott Bay for the benefit of the environment in the action area.

Dredging of the sediments will temporarily increase turbidity and decrease dissolved oxygen concentrations in the water column in the immediate vicinity of the dredging

operation. While water quality conditions would worsen on a temporary and localized basis during dredging, total suspended sediment and dissolved oxygen levels sufficient to cause adverse effects would be very limited in extent and duration. Dredging operations would be timed between October 16 and February 14 specifically to avoid juvenile salmonid out-migration periods to reduce impacts to sensitive fish species. This timing will dramatically reduce the temporal overlap between anticipated declines in water quality during dredging and disposal and the presence of juvenile salmonids and thus reduce exposure to a negligible level. Temporary increases in turbidity are also expected during release of the sediments from the bottom-dump barges and upon contact of the dredged sediments with the sea floor at the PSR Superfund site or the PSSDA open water site. More limited turbidity is expected once the hydraulically dredged sediments have settled out at the upland disposal site (Riverside Business Park) and the overflow water reenters the river.

The proposed dredging and disposal would occur when background levels of turbidity are naturally higher due to high winter levels of precipitation and runoff; this further reduces the proportional effect of any temporary increases in turbidity. Therefore, temporary increases in turbidity and decreases in dissolved oxygen during dredging and disposal activities are expected to be insignificant and discountable and are not expected to result in long-term degradation of the existing water quality condition within the action area or to have adverse effects on listed species (as detailed in the 2005-2009 Biological Assessment, Corps 2003).

Resident bird and marine mammal populations that utilize the lower Snohomish River are believed to be acclimated to the highly urbanized area surrounding the downstream settling basin and navigation channel. Resident individuals wintering along the shore or within areas of saltmarsh may avoid the center of the navigation channel during dredging, but this behavioral effect is expected to be temporary. Resident birds and marine mammals resting or foraging in Port Gardner Bay and Elliott Bay are also expected to avoid the immediate area of the disposal activities while the barges are being emptied over the PSSDA site or the PSR Superfund site. Resident birds and marine mammals are expected to immediately return to their usual foraging areas and behaviors after the dredging stops and thus the proposed action is not expected to reduce the foraging prey base for resident or migrating birds or marine mammals. Terrestrial animals foraging along the shoreline and riparian areas could be flushed from the immediate shoreline area during dredging. Animals within the immediate vicinity of the dredge material disposal area of the Riverside Business Park site would also likely temporarily leave the area during placement of the dredged sediments onto the site.

However, all of these species are expected to immediately return to their usual foraging and resting areas and typical behaviors after the dredging and disposal activities stop or move out of their immediate vicinity. The proposed dredging and disposal activities are thus expected to have insignificant and discountable effects on resident and migratory birds, marine mammals, and terrestrial animals in the action area and are not expected have adverse effects on listed bird or marine mammal species (as detailed in the 2005-2009 Biological Assessment, Corps 2003).

b. Evaluation of Impacts on Recreational, Aesthetic and Economic Values. There is potential for some disruption of aesthetic and recreational resources and vessel traffic during the mobilization and de-mobilization of the dredges and barges. There would be a temporary and localized reduction in air quality due to emissions from equipment and increases in noise would occur during dredging and disposal of the sediment. However, these disruptions would be temporary and only affect only the immediate vicinity of the dredging and disposal operations. There would be a temporary disruption to local bird and wildlife watching from shore and from the river channel as a result of the dredging and disposal activities, but the disruption would cease once dredging and disposal operations were concluded. Due to the time of year (winter) recreational use of the river is expected to be limited. There would be little disruption to local vehicular traffic as a result of the dredging and disposal activities due to the aquatic nature of the vessels used. Ultimately, by removing the shoaling sediments from the navigation channel and settling basins, the ability of vessels to safely navigate the lower river and thus provide economic value to the action area would be maintained.

Due to their temporary and localized nature, any changes to recreational, aesthetic, and economic values within the action area as a result of dredging and disposal activities are expected to be insignificant and discountable. The Preferred Alternative is not expected to result in long-term degradation of recreational, aesthetic, or economic values within the action area.

Findings. The Corps has evaluated all relevant aspects of the dredging and disposal actions and finds that the dredging and disposal of sediments from the lower Snohomish River will not individually or cumulatively result in significant degradation of the aquatic ecosystem. The Corps also finds that there will be no significant impacts, either cumulatively or individually, on the recreational, aesthetic, or economic values of the aquatic environment.

7. Determination on Inclusion of All Appropriate and Practicable Measures To Minimize Potential Harm to the Aquatic Ecosystem.

a. Impact Avoidance and Minimization Measures. The dredging window of October 16 through February 14 was selected in order to avoid impacts to sensitive life history stages (juveniles) of anadromous salmonids from decreased water quality during the dredging operations. Avoiding the shoreline and associated intertidal habitats that have high value to fish and wildlife species (including important rearing and foraging habitats for threatened and endangered fish species) will also minimize the impact of the dredging operations to local fish and wildlife species.

Water quality monitoring during dredging, disposal, and discharge of water from the Riverside Business Park site will minimize water quality effects of the dredging and discharge of sediments. The Corps will shut down dredging

operations to allow the water column to clear if water quality conditions set forth by the Washington Department of Ecology are temporarily exceeded.

The locations for disposal have been chosen to minimize the effects of the discharge of the dredged sediments by beneficially using the dredged sediments to the maximum extent practicable. Use of the sediments for capping the PSR Superfund site will minimize the human health and food web effects of continuing chemical contamination of the benthic community in Elliott Bay. Use of the sediments to renourish Jetty Island will offset erosion of the island's habitats and will maintain existing intertidal habitats that benefit fish and wildlife species. Upland disposal at the Riverside Business Park site does not impact any sensitive aquatic sites and was specifically selected because it has been used previously to contain dredged materials. The PSSDA non-dispersive open water site in Port Gardner was also specifically selected because it has been used previously for the discharge of dredged materials and it is located at water depth that will not disrupt water current or circulation patterns.

b. **Compensatory Mitigation Measures.** Unavoidable impacts from the dredging and disposal of sediments to subtidal habitats and invertebrate communities are expected to be temporary and insignificant in nature. As a result of the steps taken to avoid and minimize impacts, no long-term loss of aquatic habitat will result from the dredging and disposal activities and no compensatory mitigation is required.

Findings. The Corps finds that all appropriate and practicable measures have been taken to minimize harm to the aquatic environment.

8. Determination on Other Factors In the Public Interest.

a. **Fish and Wildlife.** The Corps has coordinated with State and Federal Agencies, as well as with the Tulalip Tribes to assure careful consideration of fish and wildlife resources within the action area. The Corps has prepared a Biological Assessment in accordance with the Endangered Species Act. The Corps has received letters of concurrence with Section 7(a)(2) of the Endangered Species Act from the NOAA Fisheries Service and the U.S. Fish and Wildlife Service. The Corps received concurrence from USFWS on December 16, 2003 and from NOAA Fisheries on October 31, 2003 and as amended via email on December 15, 2003 in response to the September 30, 2003 Biological Assessment and the November 13, 2003 amendment to that document. The Corps also received concurrence from both Services on July 22, 2004 on a subsequent amendment to the BA dated May 28, 2004, which included the Riverside Business Park site as a permitted disposal location.

b. **Water Quality.** Public Notice CENWS OD-TS-NS-22 (April 14, 2004) served as an application for a Section 401 Water Quality Certification from the Washington Department of Ecology (Ecology). The Corps received a Section 401 Water Quality certificate for this project on September 17, 2004. The Corps will

abide by the conditions of the Section 401 Water Quality Certification as issued by the Washington Department of Ecology to ensure compliance with Washington water quality standards.

c. **Historical and Cultural Resources.** Dredging Guidance Letter No. 89-01 (March 13, 1989) states that it is the policy of the Corps of Engineers that cultural resources surveys should not be conducted for maintenance dredging and disposal activities proposed within the boundaries of previously constructed navigation channels or previously used disposal areas. The proposed maintenance dredging does not deepen, widen, or otherwise change the location or configuration of the established navigation channel, settling basins, or disposal sites. Accordingly, no new cultural resources surveys were conducted for this project.

   Based on previous research by the Corps archeologist and review of the dredging and disposal locations by the Tulalip Tribes, there does not appear to be any cultural resources located associated with the downstream or upstream settling basins, the navigation channel, Jetty Island, or the potential upland disposal sites. Similarly, there are no cultural resources listed for the project area that are eligible for the National Register. This information was previously coordinated with the State Historic Preservation Office in March 1988 and is thus consistent with the National Historic Preservation Act. However, if any cultural resources are encountered during dredging or disposal activities, all work will cease and the State Historic Preservation Officer and local Native American Tribes will be notified.

   The lower Snohomish River is within the usual and accustomed fishing areas for the Tulalip Tribe. Continued coordination with the Tulalip Tribes will ensure no conflict between the proposed dredging and disposal activities and the usual and accustomed fishing activities of the Tribes.

d. **Activities Affecting Coastal Zone.** The Corps prepared a Coastal Zone Management Act (CZMA) Consistency Determination dated April 20, 2004 to ensure that the maintenance dredging and disposal activities will be conducted in a manner consistent with the Washington State Coastal Zone Management Program to the maximum extent practicable. The Consistency Determination dated April 22, 2004 was submitted to the Washington Department of Ecology for their concurrence in conjunction with the Corps' application for a Section 401 Water Quality Certification. The Corps received a Coastal Zone Consistency statement on September 17, 2004 from the Washington Department of Ecology.

e. **Navigation.** The primary purpose of the maintenance dredging and disposal project is to assure a safe and reliable navigation channel by removing shoaled sediments from the navigation channel and settling basins. The Corps has determined that there will be no substantial impairment of navigation or anchorage within the action area as a result of this project.

f. Environmental Benefits. The quality of the environment within the action area will benefit from the use of the dredged sediments as a cap at the PSR Superfund site and to renourish Jetty Island. Isolation of the contaminated sediments at the PSR Superfund site will benefit the benthic invertebrate community and will consequently benefit the entire food web of Elliott Bay, including human who consume fish and invertebrates from the waters of Puget Sound. The addition of clean sediment to Jetty Island will offset the natural erosion and consequent loss of habitat from the island and will help to maintain existing intertidal habitats of the island that are beneficial rearing grounds for fish and wildlife.

Findings. The Corps has determined that this project is within the public interest.

9. Conclusions. Based on the analyses presented in project NEPA documents, as well as the following 404(b)(1) Evaluation and General Policies for the Evaluation of Permit Applications analysis, the Corps finds that this project complies with the substantive elements of Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.

404(b)(1) Evaluation [40 CFR § 230] and Evaluation for General Policies for the Evaluation of Permit Applications [33 CFR §320.4]

404(b)(1) Evaluation [40 CFR§230]

Potential Impacts on Physical and Chemical Characteristics (Subpart c).

1. Substrate [230.20]

Only dredged material suitable for unconfined, open-water disposal can be discharged at the Puget Sound Dredged Disposal Analysis (PSSDA) disposal sites. These sites are designated locations chosen based on currents, biological sensitivities, and human activities in order to dispose of dredged materials at locations that are ecologically safe, as well as economically and logistically viable. Candidate material for disposal is thoroughly tested, through a series of tiered chemical and biological testing protocols, to determine if it is suitable grain size and chemical composition, including the presence of chemicals that are known to bioaccumulated in aquatic food webs.

The Port Gardner PSSDA site has received approximately 2,020,973 cubic yards of dredged sediments since its inception in 1989. Deposition of dredged sediments at the PSSDA open water non-dispersive sites will slowly change the bottom elevation and contours. However, the estimated 15-year capacity of the site is 8,243,000 cubic yards; to date the site is thus at 24.5 percent of its estimated capacity. During this round of maintenance dredging, the PSSDA site would receive sediments from either basin in excess of the quantities needed for beneficial use at the PSR Superfund, Riverside Business Park, or Jetty Island sites.

PSDDA protocol testing of the sediments from the portions of the downstream settling basin and adjacent portions of the navigation channel to be dredged in FY 2005 took place the week of September 22, 2003. On January 28, 2004, the results of this testing determined that sediments from the downstream settling basin and channel are again appropriate for open water disposal at the Port Gardner PSSDA site. Sediments from the upstream basin were similarly tested in March 2004. On July 7, 2004, the results of this testing determined that the sediments from the upstream settling basin and channel are also appropriate for open water disposal at the Port Gardner PSSDA site.

EPA confirmed on April 27, 2004 that the sediments from the downstream basin were acceptable for use as capping material for the PSR Superfund site. EPA is in the process of confirming that sediments from the upstream basin are also suitable for use as capping material for the PSR Superfund site. Material within the downstream settling basin is characterized as 48 to 76 percent very fine to coarse sands with approximately 18 to 50 percent fines with one percent or less gravel or silty sands; this material is appropriate for use both as capping material at the PSR Superfund site and for renourishment of Jetty Island. The sediments within the upstream settling

basin are characterized as 71 to 97 percent sands; this material is appropriate for capping the PSR Superfund site and for rehandling as clean fill at the Riverside Business Park site.

2. **Suspended Particulates/Turbidity [230.21.**
   Dredging will result in short-term increases in suspended particulates and turbidity within the dredged areas and surrounding mixing zones. Dredging operations will be carefully monitored and actively managed to minimize the concentration and duration of periods of elevated turbidity and to ensure that elevated turbidity levels do not extend past the permitted mixing zones, as specified in the 401 Water Quality Certification issued by the Washington Department of Ecology. The Corps expects increased turbidity to be localized to the immediate area surrounding the dredging and to take place over a short time frame (three to four weeks). Deposition of the dredged sediments onto the PSR Superfund site, the PSSDA open water site, and onto Jetty Island and the Riverside site will also result in short-term, localized increases in turbidity. However, due to the relatively large grain size of the sediments anticipated from the upstream and downstream settling basins, the sediments are expected to settle out of the water column fairly quickly and thus increased levels of turbidity are expected to be of short duration. No reductions in primary productivity, foraging success, oxygen availability, or increases in contaminate mobility are expected due to the short duration, limited area, and clean sediment.

3. **Water [230.22].**
   Dredging and disposal of sediments will result in short-term decreases in water quality, associated with increased turbidity. Dissolved oxygen levels in the water may decline in the immediate vicinity of the dredging and at the disposal locations due to the suspension of anoxic bottom sediments creating elevated chemical oxygen demand. However, dissolved oxygen levels within the river, Port Gardner Bay, and Elliott Bay are generally high during the time period of the dredging (October through February) and declines in water quality are expected to be of short duration and localized to the immediate area surrounding the dredging and disposal operations. Water quality monitoring as specified in the 401 Water Quality Certification issued by the Washington Department of Ecology will ensure that water quality conditions are maintained outside of the allowable mixing zone around the dredging machinery and at the disposal locations and points where return waters reenter the Snohomish River and Port Gardner Bay (i.e. from the Riverside and Jetty Island sites). Containment measures implemented by EPA are expected to ensure isolation of chemical contaminates during capping of the PSR Superfund site. Thus, no long-term changes to the chemical or physical characteristics of the receiving waters are expected.

4. **Current Patterns and Water Circulation [230.23].**
   Dredging the navigation channel and the settling basins will not disrupt current patterns or water circulation within the lower Snohomish River. The maintenance dredging will return the shoaled portions of the navigation channel and settling basins to their authorized width and depth, but will not alter obstruct flow, change the

direction or velocity of water movement, or otherwise significantly change the dimensions of the navigation channel or settling basins.

Similarly, the Corps does not expect any changes to the current patterns or water circulation at the disposal sites. The PSSDA site in Port Gardner Bay is a non-dispersive site, indicating that current velocities are low (peak 1% current velocities less than 25 cm/sec and move predominantly northward to westward. The site is relatively flat, with slopes of less than one foot vertical over a horizontal distance of 200 feet. With these low current velocities, dredged sediment remains primarily within the disposal zone, where environmental effects on sediment and benthos are monitored by the Dredged Material Management Program agencies, of which the Corps is the lead agency. The placement of dredged sediments onto Jetty Island and onto the Riverside Business Park site will also not alter the current patterns or circulation within Port Gardner Bay or the lower Snohomish River. Capping of the PSR Superfund site is similarly not expected to change current patterns or circulation within Elliott Bay due to its depth and discrete location.

5. **Normal Water Fluctuations [230.24].**
   Dredging the navigation channel and the settling basins will not alter normal water-level fluctuations within the lower Snohomish River and Port Gardner Bay. The Corps expects no change in the periods or extremes of tidal fluctuation. By removing shoaled sediments from the settling basins, the dredging will increase the channel capacity of the river in these areas, but this change is not expected to significantly affect the transport of flood flows down the river or to alter local flood potentials. The Corps similarly expects no change in normal water fluctuations at any of the disposal sites due to the deposition of dredged sediments.

6. **Salinity Gradients [230.25].** Neither the maintenance dredging nor the disposal of dredged sediments will create any obstructions that could divert or restrict the flow of salt or fresh water within the action area. Thus, the Corps expects no change in salinity gradients within the lower Snohomish River, Port Gardner Bay, or Elliott Bay.

Potential Impacts on Biological Characteristics of the Aquatic Ecosystem (Subpart D)

1. **Threatened and Endangered Species [230.30].**
   The Corps has prepared a Biological Assessment for this project and coordinated with the U.S. Fish and Wildlife Service and NOAA Fisheries Service to assure compliance with the Endangered Species Act. The Biological Assessment concluded that the maintenance dredging and disposal was not likely to adversely affect Coastal/Puget Sound bull trout (*Salvelinus confluentus*), Puget Sound chinook salmon (*Oncorhynchus tshawytscha*), marbled murrelets (*Brachyramphus marmoratus*), Stellar sea lions (*Eumetopias jubatus*), and bald eagles (*Haliaeetus leucocephalus*) and would have no effect on humpback whales (*Megaptera novaengliae*) or leatherback sea turtles (*Dermochelys coriacea*). The Corps has received letters of concurrence with Section 7(a)(2) of the Endangered Species Act from the NOAA Fisheries Service and the U.S. Fish and Wildlife Service. The Corps received

concurrence from USFWS on December 16, 2003 and from NOAA Fisheries on October 31, 2003 and as amended via email on December 15, 2003 in response to the September 30, 2003 Biological Assessment and the November 13, 2003 amendment to that document. The Corps also received concurrence from both Services on July 22, 2004 on a subsequent amendment to the BA dated May 28, 2004, which included the Riverside Business Park site as a permitted disposal location.

2. **Fish, Crustaceans, mollusks and other aquatic organisms in the food web [230.31].** Benthic organisms (including mollusks, crabs, shrimp, invertebrates, and bottom-dwelling fish) in and adjacent to the dredged shoals and the footprint of the disposal areas at the PSR Superfund site, Jetty Island, and the PSSDA site in Port Gardner Bay will be destroyed by the dredging and disposal of sediments. However, these impacts are expected to be temporary in nature and limited in extent to the immediate vicinity of the dredging and disposal. The temporary reduction in benthic prey may affect fish, birds, and marine mammals that prey on these organisms. However, this impact is expected to be temporary because the benthic community is expected to recolonize the disturbed areas relatively quickly from adjacent undisturbed areas. No long-term disruption of the food web is expected. Capping the PSR Superfund site with clean sediments is expected to ultimately isolate contaminated sediments and prevent their bioaccumulation within the aquatic food web.

3. **Other Wildlife [230.32].** Aquatic and terrestrial birds and mammals in the immediate vicinity of the dredging will be temporarily disturbed and likely displaced from their habitats within and immediately adjacent to the navigation channel and settling basins. However, these impacts are expected to be temporary in nature and limited in extent to the immediate vicinity of the dredging and disposal. No long-term disruptions to wildlife or food-webs is expected.

Potential Impacts on Special Aquatic Sites (Subpart E)

1. **Sanctuaries and Refuges [230.40].** Not applicable.

2. **Wetlands [230.41].** No dredging or disposal of material will take place in wetland areas along the shoreline of the lower Snohomish River. None of the wetlands located on the Riverside site will be filled by placement of the dredged sediments within the dredge material cell on the southern portion of the site. A small portion of Wetland C (an intertidal salt marsh) and the adjacent riparian vegetation along the shoreline will be temporarily disturbed by the placement and presence of the hydraulic pipeline during dredging of the upstream settling basin. However, these impacts will occur for a short period of time during the dormant season for the plants and will be confined to the immediate area under and around the pipeline. No long-term change in the species diversity, plant density, or character of these wetland and riparian areas is expected once the pipeline is removed at the end of the sediment placement into the dredged material cell.

3. **Mud Flats [230.42].** No dredging or disposal of material will take place in the areas of intertidal mudflat that fringe the navigation channel, settling basins, and shoreline of the lower Snohomish River.

4. **Vegetated Shallows [230.43].** There are eelgrass beds located to the west of Jetty Island. No dredging or disposal will occur within the eelgrass beds and the Corps will use careful construction measures to avoid disturbance of off shore eelgrass beds during deposition of dredged sediments onto the western shoreline of Jetty Island.

5. **Corral Reefs [230.44].** Not applicable.

6. **Riffle and Pool Complexes [230.45].** Not applicable.

Potential Effects on Human Use Characteristics (Subpart F)

1. **Municipal and Private Water Supplies [230.50].** Not applicable.

2. **Recreation and Commercial Fisheries [230.51].** This project is not expected to impact the suitability of the lower Snohomish River, Port Gardner Bay, or Elliott Bay for recreational or commercial fisheries. While local fish populations may experience be disturbed by the turbidity, noise, and activity associated with the dredging and disposal operations, these impacts are expected to be temporary in nature and limited in extent to the immediate vicinity of the dredging and disposal. No long-term disruptions to fish populations is expected. Recreational fishing may be temporarily disrupted in the immediate vicinity of the dredging and disposal activities, as vessels would have to navigate around dredging and barge equipment. However, these impacts are not expected to be significant. There are no commercial fisheries within Elliott Bay or Port Gardner Bay to be impacted by this project. The Corps continues to coordinate with the Tulalip Indian Nation regarding tribal fishing that may occur with the lower Snohomish River and in Port Gardner Bay during the period of dredging and disposal activities.

3. **Water-related Recreation [230.53].** Due to the timing of the dredging and disposal activities (October through February), water related recreation on the lower Snohomish River, on Jetty Island, and within Port Gardner and Elliott Bays is expected to be very limited. While some disturbance to bird and wildlife watching, recreational boating, kayaking, and hiking along the shoreline may take place, such disturbance is expected to be temporary in nature and limited in extent to the immediate vicinity of the dredging operations.

4. **Aesthetics [230.53].** The dredging and disposal of the sediments will not significantly change the general character of the lower Snohomish River, Port Gardner Bay, Jetty Island, or Elliott Bay or the quality of life of local residents. The aesthetics of the action area may be temporarily impacted during the period of active dredging due to the noise and temporary turbidity, but this impact is expected to be temporary in nature and limited in extent to the immediate vicinity of the dredging. The deposition of sediments onto Jetty Island will change the aesthetics of the

renourished portion, giving it the appearance of an elevated sand dune. As the dredged material cell within the Riverside Business Park site is currently devoid of vegetation and contains previously dredged sediments, no change to the aesthetics of the site is expected. Both the PSSDA and the PSR Superfund disposal sites are underwater, and as such, are not viewable.

5. **Parks, National and Historic Monuments, National Seashores, Wilderness Areas, Research Sites and Similar Preserves [230.54].** Not applicable.

Evaluation and Testing (Subpart G)

1. **General Evaluation of Dredged or Fill Material [230.60].** The sediments of the settling basins and adjacent portions of the navigation channel are considered 'low-moderate' ranked for contaminates. PSSDA protocol sediment suitability testing determined on January 28, 2004 that sediments from the downstream settling basin and channel are appropriate for open water disposal at the Port Gardner PSSDA site; sediment suitability testing determined on July 7, 2004 that sediments from the upstream settling basin and adjacent portion of the channel are also appropriate for open water disposal at the Port Gardner PSSDA site. Sediments suitable for disposal at the PSSDA open-water sites are also considered appropriate for beneficial use at the Jetty Island and Riverside Business Park sites.

   EPA confirmed on April 27, 2004 that the sediments from the downstream basin were acceptable for use as capping material for the PSR Superfund site. EPA is in the process of confirming that sediments from the upstream basin are also suitable for use as capping material for the PSR Superfund site. These confirmations were based on tests for the Washington State Department of Ecology's Sediment Management Standards (SMS) and Atterberg Limits. The sediment characterizations collected in calendar year 2004 have a 'recency frequency' of five to seven years; contaminate testing will thus be required again in 2009 to 2011 prior to dredging.

2. **Chemical, Biological, and Physical Evaluation and Testing.** All candidate material for disposal at PSSDA and Superfund sites is thoroughly tested, through a series of tiered chemical and biological testing protocols, to determine if it is suitable grain size and chemical composition, including the presence of chemicals that are known to bioaccumulated in aquatic food webs. These evaluations have been completed (see 1. above) and the material has been found suitable for both open water disposal and beneficial use.

Actions to Minimize Adverse Effects (Subpart H)

1. **Actions concerning the location of the discharge [230.70].** The locations for disposal have been chosen to minimize the effects of the discharge on the dredged sediments by beneficially using the sediments to the maximum extent practicable. Use of the sediments for capping the PSR Superfund site will minimize the human

health and food web effects of continuing chemical contamination of the benthic community in Elliott Bay. Use of the sediments to renourish Jetty Island will offset erosion of the island's habitats and will maintain existing intertidal habitats that benefit fish and wildlife species. Upland disposal at the Riverside Business Park site does not impact any sensitive aquatic sites and was specifically selected because it has been used previously to contain dredged materials. The PSSDA non-dispersive open water site in Port Gardner was also specifically selected because it has been used previously for the discharge of dredged materials and it is located at water depth that will not disrupt water current or circulation patterns.

2. **Actions concerning the material to be discharged [230.71].** PSSDA protocol sediment suitability testing, as well as tests for the Washington State Department of Ecology's Sediment Management Standards (SMS) and Atterberg Limits has been conducted to ensure that the material to be dredged and discharged is not contaminated and will not pollute the receiving water bodies.

3. **Actions controlling the material after discharge [230.72].** Dredged sediments used to renourish Jetty Island will be held in place behind a containment levee constructed to reduce the sediment plume that occurs while placing the sediments onto the island.

4. **Actions affecting the method of dispersion [230.73].** The PSSDA site in Port Gardner Bay is a non-dispersive site, intended to limit the transport of deposited sediments outside of the disposal zone. The berm around the dredged material cell on the Riverside Business Park site is designed to contain the dredged sediments on the site and limit the dispersion of sediments off of the site. Similarly, a containment levee will be used on Jetty Island to reduce the sediment plume as the material is deposited onto the island.

5. **Actions related to technology [230.74].** A pipeline dredge will be used to place dredged sediments onto the Riverside Business Park site and Jetty Island because it provides for direct placement and minimal rehandling of the sediments, thus minimizing spillage during rehandling and transport of the dredged sediments.

6. **Actions affecting plant and animal populations [230.75].** The dredging window of October 16 through February 14 was selected in order to avoid impacts to sensitive life history stages (juveniles) of anadromous salmonids from decreased water quality during the dredging operations. Avoiding the shoreline and associated intertidal habitats that have high value to fish and wildlife species (including important rearing and foraging habitats for threatened and endangered fish species) will also minimize the impact of the dredging operations to local fish and wildlife species.

   Water quality monitoring during dredging, disposal, and discharge of water from the Jetty Island and Riverside Business Park sites will minimize water quality effects of the dredging and discharge of sediments on local plant and animal populations. The Corps will shut down dredging operations to allow the water column to clear if water

quality conditions set forth by the Washington Department of Ecology are temporarily exceeded.

The Corps has also coordinated the dredging and disposal operations with the U.S. Fish and Wildlife Service and NOAA Fisheries Service to assure compliance with the Endangered Species Act. The Corps continues to coordinate with the Tulalip Indian Tribes to ensure minimal impact to tribal fisheries.

7. **Actions affecting human use [230.76].** The Corps has taken all appropriate and practicable steps to assure minimal impacts to human use, their safety and general appreciation of the area. The dredging window of October 16 through February 14 also minimizes potential overlaps between the dredging and disposal operations and summer periods of higher recreational use of the lower river. This winter window also minimizes aesthetic and transportation related impacts to the local area.
8. **Other Actions [230.77].** Unavoidable impacts from the dredging and disposal of sediments to subtidal habitats and invertebrate communities are expected to be temporary and insignificant in nature. As a result of the steps taken to avoid and minimize impacts, no long-term loss of aquatic habitat will result from the dredging and disposal activities. The combination of the containment levees on the Riverside Business Park site and on the Jetty Island site will control runoff during deposition of dredged sediments. No significant ecological change in the aquatic environment is expected as a result of these dredging and disposal activities.

General Policies for Evaluating Permit Applications [33 CFR §320.4]

1. **Public Interest Review [320.4(a)].** The Corps finds these actions to be in compliance with the 404(b)(1) guidelines and not contrary to public interest.

2. **Effects on wetlands [320.4(b)].** No wetlands will be permanently or significantly altered by the proposed dredging or disposal activities. See 404(b)(1) evaluation, *Potential Impacts to Special Aquatic Sites (Subpart E), (2) Wetlands 230.41*.

3. **Fish and Wildlife [320.4(c)].** The Corps has worked diligently to avoid and minimize effects of the proposed dredging and disposal activities on fish and wildlife. The Corps has received letters of concurrence with Section 7(a)(2) of the Endangered Species Act from the NOAA Fisheries Service and the U.S. Fish and Wildlife Service. The Corps received concurrence from USFWS on December 16, 2003 and from NOAA Fisheries on October 31, 2003 and as amended via email on December 15, 2003 in response to the September 30, 2003 Biological Assessment and the November 13, 2003 amendment to that document. The Corps also received concurrence from both Services on July 22, 2004 on a subsequent amendment to the BA dated May 28, 2004, which included the Riverside Business Park site as a permitted disposal location.

4. **Water Quality [320.4(d)].** The Corps actively coordinated with the Washington Department of Ecology to obtain a Clean Water Act Section 401 Water Quality Certificate for this project, including a temporary water quality modification and

associated points of compliance, as well as water quality monitoring during dredging and upland disposal activities. The Corps received a Section 401 Water Quality certificate for this project on September 17, 2004. The Corps will abide by the conditions of the Section 401 Water Quality Certification as issued by the Washington Department of Ecology to ensure compliance with Washington water quality standards.

5. **Historic, Cultural, Scenic, and Recreational Values [320.4(e)].** No Wild and Scenic Rivers, historic properties, National Landmarks, National Rivers, National Wilderness Areas, National Seashores, National Recreational Areas, National Lakeshores, National Parks, National Monuments, estuarine and marine sanctuaries, or archeological resources will be impacted by the proposed dredging and disposal activities.

   The Corps has coordinated with representatives of the Tulalip Tribes and determined that the dredging and disposal activities will have no effect on historic or cultural resources. This information was previously coordinated with the State Historic Preservation Office in March 1988 and is thus consistent with the National Historic Preservation Act.

   Recreational values will be temporarily decreased during the periods of active dredging and disposal, but this effect is not expected to be long-term or significant.

6. **Effects on Limits of the Territorial Sea [320.4(f)].** Not applicable.

7. **Consideration of Property Ownership [320.4(g)].** Not applicable.

8. **Activities Affecting Coastal Zones [320.4(h)].** The Corps prepared a Coastal Zone Consistency statement and determined that the proposed dredging and disposal activities are consistent to the maximum extent practicable with the Snohomish County Shoreline Master Program and thus with the Washington State Coastal Zone Management Program. The Corps submitted the consistency statement to the Washington Department of Ecology on September 24, 2003 and also included it in the Application for 401 Water Quality Certification submitted to the Washington Department of Ecology on April 22, 2004. The Corps received a Coastal Zone Consistency statement from the Washington Department of Ecology on September 17, 2004.

9. **Activities in Marine Sanctuaries [320.4(i)].** Not applicable.

10. **Other Federal, State, or Local Requirements [320.4(j)]. Please also refer to the Environmental Assessment, Section 9 Environmental Compliance.**
    a) National Environmental Policy Act (NEPA). The draft Environmental Assessment (EA) was prepared, dated May 11, 2004. The Environmental Assessment was finalized on September 20, 2004 via incorporation of comments received on the draft EA and Public Notice and to satisfy the documentation requirements of NEPA.

b) Endangered Species Act. In accordance with Section 7(a)(2) of the Endangered Species Act, a Biological Assessment was prepared by the Corps and submitted to NOAA Fisheries Service and U.S. Fish and Wildlife Service on September 29, 2003. The BA was subsequently twice amended, with a November 13, 2003 Memorandum amending proposed dredging dates to FY 2005 through 2009 and a May 28, 2004 amendment proposing inclusion of Riverside Business Park site for disposal. The Corps received concurrence from USFWS on December 16, 2003 and from NOAA Fisheries on October 31, 2003 and as amended via email on December 15, 2003 in response to the BA and the November 13, 2003 amendment. The Corps also received concurrence from both Services on July 22, 2004 on a subsequent amendment to the BA dated May 28, 2004, which included the Riverside Business Park site as a permitted disposal location.

c) Clean Water Act. This document records the Corps evaluation and findings regarding this project pursuant to Section 404 of the Clean Water Act. The Corps requested a Clean Water Act Section 401 Water Quality Certification from the Washington Department of Ecology on April 22, 2004. The Corps received a Section 401 Water Quality certificate for this project on September 17, 2004, which included a temporary water quality modification and associated points of compliance, as well as water quality monitoring during dredging and upland disposal activities. The Corps will abide by the conditions of the Section 401 Water Quality Certification as issued by the Washington Department of Ecology to ensure compliance with Washington water quality standards.

d) Coastal Zone Management Act. The Corps prepared a Coastal Zone Consistency statement that was submitted to the Washington Department of Ecology on September 24, 2003 and also included in the Application for 401 Water Quality Certification submitted to the Washington Department of Ecology on April 22, 2004. The Corps received a Coastal Zone Consistency statement from the Washington Department of Ecology on September 17, 2004.

e) Rivers and Harbors Act. This document records the Corps' evaluation and findings regarding this project pursuant to the Section 10 of the Rivers and Harbors Act.

f) National Historic Preservation Act. Dredging Guidance Letter No. 89-01 (March 13, 1989) states that it is the policy of the Corps of Engineers that cultural resources surveys should not be conducted for maintenance dredging and disposal activities proposed within the boundaries of previously constructed navigation channels or previously used disposal areas. Based on previous research by the Corps archeologist and review of the dredging and disposal locations by the Tulalip Tribes, there does not appear to be any cultural resources located associated with the downstream or upstream settling basins, the navigation channel, Jetty Island, or the potential upland disposal sites. Similarly, there are no cultural resources listed for the project area that are eligible for the National Register. This information was previously coordinated

with the State Historic Preservation Office in March 1988 and is thus consistent with the National Historic Preservation Act.

g) Fish and Wildlife Coordination Act. The Corps has consulted with U.S. Fish and Wildlife Service and NOAA Fisheries Service as part of the required consultation for Section 7(a)(2) of the Endangered Species Act. Through this consultation process, the Corps has given consideration to fish and wildlife resources and has made adequate provisions for fish and wildlife resources through the mitigating measures incorporated into this project to protect fish and wildlife consistent with the Fish and Wildlife Coordination Act (see 404(b)(1) evaluation, *Potential Impacts on Biological Characteristics of the Aquatic Ecosystem (Subpart D) and Actions to Minimize Adverse Effect (Subpart H).*

11. **Safety of Impoundment Structures [320.(k)].** Not applicable.

12. **Floodplain Management [320.(l)].** The proposed maintenance work will not alter any floodplain areas.

13. **Water Supply and Conservation [320.4(m)].** Not applicable.

14. **Energy Conservation and Development [320.4(n)].** Not applicable.

15. **Navigation [320.4(o)].** No impairment of navigation or anchorage will occur as a result of this project. The maintenance dredging and disposal will ensure safe and predictable navigation within the lower Snohomish River and will maintain the federal navigation project. Local marinas will be notified of the project so they may anticipate minor navigation interruptions that could occur during dredging and disposal activities.

16. **Environmental Benefits [320.4(p)].** Beneficial effects to the quality of the environment from the proposed maintenance dredging and disposal include beneficial use of the dredged sediments to renourish Jetty Island and thus protect the embayment along the arm of the island. By protecting the embayment, intertidal marsh and mudflat habitats are protected for juvenile salmonids, forage fish, and the benthic invertebrates.

17. **Economics [320.4(q)].** Not applicable.

18. **Mitigation [320.4(r)].** See 404(b)(1) evaluation, *Actions to Minimize Adverse Effect (Subpart H).*

APPENDIX B:

NOAA FISHERIES SERVICE AND U.S. FISH AND WILDLIFE SERVICE

ENDANGERED SPECIES ACT CONCURRENCE LETTERS

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

NMFS Tracking No.:
2003/01258

October 31, 2003

Mark T. Ziminske
Corps of Engineers, Seattle District
Environmental Resources Section CENWS-PM-PL-ER
Post Office Box 3755
Seattle, Washington 98124-3755

Re: Endangered Species Act Section 7 Informal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for the proposed Maintenance Dredging of the Snohomish River Navigation Channel. WRIA 7.

Dear Mr. Ziminske:

This correspondence is in response to your request for consultation under the Endangered Species Act (ESA). Additionally, this letter serves to meet the requirements for consultation under the Magnuson-Stevens Fishery Conservation and Management Act (MSA).

Endangered Species Act

The Army Corps of Engineers (COE) submitted a Biological Assessment (BA) to NOAA's National Marine Fisheries Service (NOAA Fisheries) for the above referenced project on October 1, 2003 and requested NOAA Fisheries' concurrence with a determination of "may affect, not likely to adversely affect" for Puget Sound chinook salmon (*Oncorhynchus tshawytscha*) and Stellar sea lion (*Eumetopias jubatus*). This consultation with the COE is conducted under section 7(a)(2) of the ESA, and its implementing regulations, 50 CFR 402.

The COE proposes to conduct maintenance dredging of the Snohomish River navigation channel. The navigation channel is located in the lower 6.5 miles of the Snohomish River. The dredging activity will occur primarily in the two settling basins, one located at the upper end of the navigation channel, near the I5 bridge, the other located downstream near the Everett Marina. The dredge material will be disposed of in the Port Gardner Puget Sound Dredge Disposal Analysis site or used to cap contaminated sediment in Elliott Bay. The BA calls for several dredge events over 5 years.

NOAA Fisheries concurs with your findings of "may affect, not likely to adversely affect," for the reasons stated in the BA: (1) Dredging will occur during a time of the year when chinook salmon juveniles are unlikely to be present; (2) the dredge techniques and technology will not entrain fish; and (3) dredge activities will be restricted to the central portions of the river channel, well away from intertidal habitat.

This concludes informal consultation on this action in accordance with 50 CFR 402.14(b)(1). The COE must re-analyze this ESA consultation if: (1) New information reveals effects of the action that may affect listed species in a way not previously considered; (2) the action is modified in a manner that causes an effect to the listed species that was not previously considered; or (3) a new species is listed, or critical habitat designated, that may be affected by the identified action.

Magnuson-Stevens Fishery Conservation and Management Act

Federal agencies are required, under section 305(b)(2) of the MSA and its implementing regulations (50 CFR 600 Subpart K), to consult with NOAA Fisheries regarding actions that are authorized, funded, or undertaken by that agency that may adversely affect Essential Fish Habitat (EFH). The MSA section 3 defines EFH as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." If an action would adversely affect EFH, NOAA Fisheries is required to provide the Federal action agency with EFH conservation recommendations (MSA section 305(b)(4)(A)). These consultations are based, in part, on information provided by the Federal agency and descriptions of EFH for Pacific coast groundfish, coastal pelagic species, and Pacific salmon contained in the Fishery Management Plans developed by the Pacific Fishery Management Council and approved by the Secretary of Commerce.

The proposed action is described on pages two through eleven of the BA. The project area includes habitat which has been designated as EFH for various life stages of 17 species of groundfish, four species of coastal pelagics, and three species of Pacific salmon (see Table 1 enclosure).

The EFH Conservation Recommendations: Because the conservation measures that the COE included as part of the proposed action (pages 59, 60 and 63 of the BA) to address ESA/EFH concerns are adequate to avoid, minimize, or otherwise offset potential adverse effects to the EFH of the species in Table 1, conservation recommendations pursuant to MSA (section 305(b)(4)(A)) are not necessary. Since NOAA Fisheries is not providing conservation recommendations at this time, no 30-day response from the COE is required (MSA section 305(b)(4)(B)).

This concludes consultation under the MSA. If the proposed action is modified in a manner that may adversely affect EFH, or if new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations, the COE will need to reinitiate consultation in accordance with the implementing regulations for EFH at 50 CFR 600.920(l).

If you have questions regarding either the ESA or EFH consultation, please contact Robert Donnelly of the Washington Habitat Branch Office at (206) 526-6117, or by electronic mail at bob.donnelly@noaa.gov.

Sincerely,

D. Robert Lohn
Regional Administrator

cc: Nancy Brennan-Dubbs, USFWS
George Hart, COE

Table 1. Species of fishes found in Puget Sound with designated EFH in the estuarine composite EFH.

Groundfish Species	Sablefish *Anoplopoma fimbria*	**Coastal Pelagic Species**
Spiny Dogfish *Squalus acanthias*	Bocaccio *S. paucispinis*	anchovy *Engraulis mordax*
California Skate *R. inornata*	Brown Rockfish *S. auriculatus*	Pacific sardine *Sardinops sagax*
Ratfish *Hydrolagus colliei*	Copper Rockfish *S. caurinus*	Pacific mackerel *Scomber japonicus*
Lingcod *Ophiodon elongatus*	Quillback Rockfish *S. maliger*	market squid *Loligo opalescens*
Cabezon *Scorpaenichthys marmoratus*	English Sole *Parophrys vetulus*	**Pacific Salmon Species**
Kelp Greenling *Hexagrammos decagrammus*	Pacific Sanddab *Citharichthys sordidus*	chinook salmon *Oncorhychus tshawytscha*
Pacific Cod *Gadus macrocephalus*	Rex Sole *Glyptocephalus zachirus*	coho salmon *O. kisutch*
Pacific Whiting (Hake) *Merluccius productus*	Starry Flounder *Platichthys stellatus*	Puget Sound pink salmon *O. gorbuscha*

Luiting, Victoria T NWS

From: Bob Donnelly [Bob.Donnelly@noaa.gov]
Sent: Monday, December 15, 2003 4:20 PM
To: Luiting, Victoria T
Subject: Re: FW: update information for Snohomish River Dredging BA

Victoria

I have reviewed the document that contains the proposed changes to the Snohomish River Dredge Project. The revised proposal involves changes in dredge timing, possible use of additional dredging techniques, and possible changes in the disposal sites. The original proposal has the NOAA Fisheries tracking number 2003/01258.

The proposed revisions to the project are not likely to change the original affect determination. Therefore I agree with your determination of may affect, not likely to adversely affect for the revised project proposal.

Bob Donnelly
NOAA Fisheries
206 526 6117

Victoria.T.Luiting@nws02.usace.army.mil wrote:

> Good morning Bob,My understanding is that yesterday you obtained a copy of our letter and updated project information for the Snohomish Dredging through the good graces of Ken Brunner and George Hart.Please confirm for me that you did get the information you need to review and let me know if you have any questions or comments on that material. I've have come to realize that we didn't get a date stamp on the letter, but that the attached project information was dated November 13, 2003. If you would be so kind as to refer to the whole package with a November 13, 2003 date, that would help us with our record keeping. thanksHave a good Friday!
> -----Original Message-----
> **From:** Luiting, Victoria T NWS
> **Sent:** Wednesday, December 10, 2003 3:57 PM
> **To:** 'Bob Donnelly'
> **Cc:** Hart, George A NWS; Miller, Patricia R NWS
> **Subject:** RE: update information for Snohomish River Dredging BA
> The update information WAS sent by hard-copy letter to the Lacey office on or around November 13, 2003 - addressed to Steve Landino, to be forwarded to you. That was the protocol I was given. Sorry it didn't make it to you in a timely fashion. Let's try the more direct route.Can you provide me with your direct mailing address and I will send the information to you directly. We would like to maintain the 'paper chain' of a hard copy going out.thanks-----Original Message-----
> **From:** Bob Donnelly [mailto:Bob.Donnelly@noaa.gov]
> **Sent:** Wednesday, December 10, 2003 2:04 PM
> **To:** Luiting, Victoria T
> **Subject:** Re: update information for Snohomish River Dredging BA
>
> Victoria
>
> In looking over the earlier email traffic it appears an updated BE was sent via regular mail. I went through the mess in my "cube" I do not see the aforementioned BE.

Luiting, Victoria T NWS

From: Bob Donnelly [Bob.Donnelly@noaa.gov]
Sent: Thursday, July 22, 2004 12:53 PM
To: Luiting, Victoria T NWS
Subject: Re: Amendment to the Snohomish River Dredging BA

Victoria

You requested our review of the proposed changes to the lower Snohomish River Dredge project (NOAA Fisheries number 2003/01258). We reviewed the documents and E-mails and have concluded that the proposed modifications will not change your earlier NLAA determination for the project, which we concurred with.

Sincerely yours,
Robert Donnelly
NOAA Fisheries
206 526 6117

"Luiting, Victoria T NWS" wrote:

> Bob, thank you for your prompt review of the amendment.
> I will address your comments in order:
> 1. Using machinery which is parked on the upland, disturbed portion of the Riverside site to pull the empty pipeline up over the marsh bench and then onto the site is the least disruptive method of getting the pipe into the site. I went out to look at the area of marsh in question to assess potential impacts - I was a wetland biologist for five years before my tenure here at the Corps.
>
> The area of marsh through which the pipeline passes is narrow, and there are several large logs laying in the marsh and extending up the bank, perpendicular to the shoreline. During placement of the pipeline, it is set on the logs and then pulled up the bank, sliding the pipeline bottom on the logs. Also note that the pipeline is empty during this action, so it is light weight; there was no evidence that the pipe had caught or dragged through the marsh while it was moved into place during past use of the site. These factors, coupled with the timeframe in which this occurs (winter dormancy for the marsh plants) minimizes the impacts to the marsh and appears unlikely to degrade the marsh or negatively effect its foodweb support or habitat functions. This landing area has been used in the past during previous placements of material at the Riverside site and was virtually indistinguishable from the adjacent areas of marsh on either side. If you would like a site visit to take a look for yourself, I would be happy to take you out there. Also, we have a photo of the landing area taken during a recent trip to the area, but I am not able to access it on our network until Monday, I'll email it as soon as I can so you can more clearly see the area I am describing.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Western Washington Fish and Wildlife Office
510 Desmond Dr. SE, Suite 102
Lacey, Washington 98503

received ERS
DEC 16 2003

In Reply Refer To:
1-3-04-I-0003

Colonel Debra M. Lewis, District Engineer
Seattle District, Corps of Engineers
ATTN: Environmental Resource Section(Hart)
P.O. Box 3755
Seattle, Washington 98124-3755

Dear Colonel Lewis:

Subject: Corps Snohomish River Navigational Channel Maintenance Dredging

This is in response to your letter dated October 1, 2003, Memorandum for the Services, and enclosed Biological Evaluation (BE). The letter, Memorandum for the Services, and BE for dredging approximately 500,000 cubic yards of material from the Snohomish River navigational channel in Everett, Snohomish County, Washington, were received in our office on October 2, 2003. Your letter requests our concurrence with your determination of "may affect, not likely to adversely affect" for bald eagles (*Haliaeetus leucocephalus*), bull trout (*Salvelinus confluentus*), and marbled murrelets (*Brachyramphus marmoratus*), as evaluated in accordance with section 7(a)(2) of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*). In a letter dated November 13, 2003, the Corps requested a modification to the original design due to repriortization of dredging needs. The original project was to start dredging in fiscal year 2004 and continue through fiscal year 2008. The Corps would now like to dredge starting in fiscal year 2005 and complete the cycle in 2009. The Corps originally intended to dredge either the upper basin or lower basin based on need, however, the Corps now intends to dredge both the upper and lower basin in 2005 then rotate basins until 2009.

In the previous maintenance dredging in the Snohomish (1-3-00-I-1412), the U.S. Fish and Wildlife Service (Service) requested that the Corps conduct fish monitoring within the mouth of the Snohomish River so that the agencies could gain a better understanding of when bull trout might be migrating through the dredging areas. Furthermore, the Corps was asked to monitor the dredge slurry for bull trout from the hydraulic cutterhead dredge. The dredge slurry monitoring only found crustaceans and flat fish in the slurry. The draft report from the fish monitoring will not be available until February 2004, but initial indication suggests that bull trout are not present during the time the Corps wishes to conduct dredging (October 15 through February 15). Once this report is finalized, the Service may allow multiple year dredging. Based on the above information, the Service is concurring only on dredging during the 2005 fiscal year.

TAKE PRIDE IN AMERICA

We believe that sufficient information was provided to determine the effects of the proposed project to federally listed species and to conclude whether this project is likely to adversely affect those species. We, therefore, concur with the "may affect, not likely to adversely affect" determination for bald eagles, bull trout, and marbled murrelets. Our concurrence is based on the information and conservation measures described in the BE, Memorandum for the Services, cover letter, and the following information:

Bull trout

-Work will be conducted during a time when bull trout are least likely to be present.
-Dredging will occur in a previously dredged area.
-No eelgrass or forage fish spawning areas will be affected.
-No nearshore dredging will occur.

Bald eagles

-No nest are located within 3 miles of the project area.
-No wintering, perching or foraging habitat will be impacted.

Marbled murrelets

-No suitable nesting habitat exists within 1 mile of the project.
-No foraging habitat will be impacted.

This concludes informal consultation pursuant to the regulations implementing the Endangered Species Act (50 CFR 402.13). This project should be reanalyzed if new information reveals effects of the action that may affect listed species or critical habitat in a manner, or to an extent, not considered in this consultation. The project should also be reanalyzed if the action is subsequently modified in a manner that causes an effect to a listed species or critical habitat that was not considered in this consultation, and/or a new species is listed or critical habitat is designated that may be affected by this project.

If you have further questions about this letter or your responsibilities under the Act, please contact Brian Missildine at (360)753-9561 or Lynn Childers at (360)753-9440.

Sincerely,

Original signed by Lynn P. Childers 12/16/03

Ken S. Berg, Manager
Western Washington Fish and Wildlife Office

cc:
WDFW, Region 4
DOE, Bellevue (A. Kelly)

Luiting, Victoria T NWS

From: Brian_Missildine@r1.fws.gov
Sent: Thursday, July 22, 2004 3:39 PM
To: Luiting, Victoria T NWS
Subject: Re: FW: Amendment to the Snohomish River Dredging BA

Torrey,

The U. S. Fish and Wildlife Service concurs with the Corps original determination of "may affect, not likely to adversely affect" listed species under our jurisdiction. This is based on the original BE, the addendum to the BE, and emails between NOAA-Fisheries, U. S. Fish and Wildlife and the Corps. As a conservation measure we would encourage the Corps to monitor the wetlands where the pipe is being place to ensure minimal damage and maximum survival of the vegetation that will be impacted. We also encourage the Corps to seek out additional appropriate locations where the beneficial use material may be applied. If you have any additional questions, please contact me.

Brian Missildine
Fish and Wildlife Biologist
USFWS
510 Desmond Dr Suite 102
Lacey, WA 98503
ph 360-753-9561
fax 360-534-9331

When you come to the edge of all the light you know, are about to step off into the darkness of the unknown, faith is knowing one of two things will happen; There will be something to stand on, or you will be taught to fly....Barbara J. Winter

"Luiting, Victoria T NWS" <Victoria.T.Luiting@nws02.usace.army.mil>
07/22/2004 03:31 PM

To: "Hart, George A NWS" <George.A.Hart@nws02.usace.army.mil>, "Miller, Patricia R NWS" <Patricia.R.Miller@nws02.usace.army.mil>
cc: "'brian_missildine@fws.gov'" <brian_missildine@fws.gov>
Subject: FW: Amendment to the Snohomish River Dredging BA

NOAA Fisheries concurrence on the addition of the Riverside site to our BA.

-----Original Message-----
From: Bob Donnelly [mailto:Bob.Donnelly@noaa.gov]
Sent: Thursday, July 22, 2004 12:53 PM
To: Luiting, Victoria T NWS
Subject: Re: Amendment to the Snohomish River Dredging BA

Victoria

APPENDIX C:

PUBLIC NOTICE

CENWS OD-TS-NS-22

US Army Corps of Engineers®
Seattle District

Public Notice

Navigation Section
CENWS OD-TS-NS
PO Box 3755
Seattle, WA 98124-3755

Public Notice Date: April 14, 2004
Expiration Date: May 7, 2004
Reference: CENWS OD-TS-NS-22

U.S. ARMY CORPS OF ENGINEERS FISCAL YEARS 2005-2009 MAINTENANCE DREDGING, SNOHOMISH RIVER NAVIGATION CHANNEL, DOWNSTREAM AND UPSTREAM SETTLING BASINS, EVERETT, WASHINGTON

Interested parties are hereby notified that the U.S. Army Corps of Engineers, Seattle District (Corps), is soliciting comments on the proposed maintenance dredging project, Snohomish River, Everett Harbor. The Port of Everett is the local sponsor for the federal navigation project. Maintenance dredging within the lower Snohomish River is necessary to protect navigational safety by removing areas of sediment shoaling within the navigation channel and the settling basins.

During the five-year period of this Public Notice, FY 2005-2009, the Corps proposes dredging by either hydraulic pipeline or mechanical clamshell of the downstream and upstream settling basins and portions of the federal navigation channel. Disposal of the dredged materials shall occur at: confined upland disposal sites furnished by the Port of Everett, the Department of Natural Resources' Port Gardner open water site and/or sites providing beneficial use of the sediment, including Jetty Island and the Environmental Protection Agency (EPA) Pacific Sound Resources (PSR) Superfund site in Elliott Bay.

In FY 2005, the Corps proposes to hydraulically or mechanically dredge approximately 260,000 CY from the downstream settling basin. The Corps may also include dredging approximately 200,000 CY from the upstream basin during FY2005. The volumes are based on hydrographic surveys of April 2003. The 460,000 CY of material from these basins shall be distributed to provide greatest benefit to the navigation requirements and potential beneficial uses of the material. In FY2005, EPA's Pacific Sound Resources superfund site in Elliott Bay may request approximately 200,000 CY to use as a containment cap. The Port of Everett is requesting approximately 150,000 CY for use at the Riverside Business Park upland site.

In the remaining years of this five-year public notice, FY2006-2009, the Corps proposes to alternate the dredging between the downstream and upstream settling basins and adjacent portions of the navigation channel. The dredging quantities, location and method will depend on the shoaling present as determined by the results of bathymetric surveys conducted each year prior to dredging. Clamshell dredging with bottom dump

barge disposal at the Port Gardner open water site or the PSR site may be used for some of the materials from the downstream and/or upstream settling basins. Hydraulic pipeline dredging with confined upland disposal may be used for some of the materials from the downstream and/or upstream settling basins. Water flowing from the hydraulic dredging shall be discharged into navigable waters.

LOCATION

The project area extends from Possession Sound upstream approximately 6.5 miles along the lower Snohomish River in Everett Harbor. The locations of proposed dredging and disposal sites are shown on three enclosed figures.

AUTHORITY

This public notice is being issued in accordance with rules and regulations published as 33 CFR 337.1, Navigation and Navigable Waters, Practice and Procedure; 39 F.R. 26635-641, 22 July 1974 and 33 CFR 320-329. The project, adopted 25 June 1910 and modified by subsequent acts, consists of navigation channels, two settling basins and dikes to serve navigation in Everett Harbor and the Snohomish River.

PROPOSED PROJECT

During the period of 2005-2009, hydraulic pipeline and/or clamshell dredging of approximately 800,000 cubic yards of clean sandy material from the upstream settling basin and 200,000 cubic yards from several shoals in the 8-foot deep river channel is proposed with disposal at a combination of several confined upland sites, PSR and/or the Port Gardner open water site. Also proposed is hydraulic pipeline and/or clamshell dredging of approximately 500,000 cubic yards of clean sandy dredged material from the downstream settling basin with disposal at Jetty Island, PSR and/or Port Gardner open water site. Water flowing from the hydraulic dredging shall be discharged into navigable waters.

Dredging will be performed during the October 16 through 14 February periods of each fiscal year.

Downstream Disposal

The proposed locations for disposal of material dredged from downstream are:

- Port Gardner open water site
- Pacific Sound Resources site
- Jetty Island

In FY2005, disposal is proposed for either Port Gardner or the PSR site by bottom-dump barge. No placement of dredged material is proposed for Jetty Island in FY2005.

In FY 2006-2009, a portion of the dredged material from the downstream settling basin is proposed to be hydraulically placed on Jetty Island to nourish and extend an eroding berm as needed to protect an existing saltmarsh habitat. This action is dependent on coordination with the Port of Everett and resource agencies. Disposal of dredged material is also anticipated at the Port Gardner site.

The Port of Everett has indicated that additional candidate upland disposal sites for the downstream basin dredged material may be identified in the future (FY06-FY09). However, actual placement of material on these additional candidate sites is contingent upon securing necessary permits and coordinating with resource agencies for compliance with the Endangered Species Act.

Upstream Disposal

The proposed locations for disposal of material dredged from upstream are:

- Port Gardner open water site
- Pacific Sound Resources site
- Port of Everett designated upland sites

The Port of Everett proposed confined upland disposal sites as depicted in the enclosed drawing are:

- Kimberly-Clark site (formerly known as the Scott Paper Disposal Area);
- Langus Riverfront Park Disposal Area (formerly known as the City site);
- Riverside Business Park Disposal Areas (formerly known as the Weyerhaeuser sites); and
- Baywood Disposal Area.

At present, FY2005, the Port of Everett has capacity to accept up to 150,000 CY of dredged material at the Riverside Business Park disposal areas. Subsequent upland disposal by hydraulic pipeline, during FY2006-2009, is contingent on permits and the available capacity of the other upland sites. These upland sites have previously been used for confined upland disposal of dredged material. During FY 2005, another possible disposal option by bottom-dump barge is the PSR Superfund site, depending on the acceptance of the material for use as a containment cap.

Upstream dredged material shall also be used in projects providing beneficial use of the material. If no upland sites or no beneficial use is available, mechanical dredging with disposal at the Port Gardner open water site is proposed.

Because the anticipated FY 2005-2009 dredging volume exceeds the estimated disposal capacity of the proposed upland sites, some variation in actual distribution of dredged volumes is expected. Actual volumes placed at the upland sites will vary based on the outcome of required coordination, necessary permits and site activities including beneficial uses, which affect site availability and actual capacity.

Shorelines permits number SMA#1-97 and #2-97 permit the disposal of dredged material onto Jetty Island and the Langus Riverfront Park Disposal Area.

ENVIRONMENTAL COMPLIANCE

An Environmental Impact Statement (EIS) dated June 1975 for the Federal navigation project has been filed with the Council on Environmental Quality by the Seattle District, Corps of Engineers. Pursuant to the National Environmental Policy Act (NEPA), a draft Environmental Assessment (EA) is currently being prepared. Once complete, the draft EA will be posted on the Seattle District web site at: http://www.nws.usace.army.mil/ers/envirdocs.html. The EA will support the Corps determination that the proposed work will not significantly affect the quality of the human environment and, therefore, an Environmental Impact Statement is not required.

A detailed Coastal Zone Management Act consistency statement was prepared and was submitted to the Department of Ecology and will be included as an appendix to the NEPA EA. This statement will support the Corps determination that the proposed maintenance work is consistent to the maximum extent practicable with the enforceable policies of the State of Washington Coastal Zone Management Program.

In September 2003, in accordance with Section 7 (a)(2) of the Endangered Species Act, the Corps entered into an informal consultation with the U.S. Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration (NOAA) Fisheries via preparation of a Biological Assessment (BA) regarding routine maintenance dredging and disposal activities in the Federal navigation channel. The BA was amended with updated project information via a November 13, 2003 letter from the Corps. The consultation concluded with a NOAA Fisheries concurrence letter dated October 31, 2003 as well as via a December 15, 2003 email from NOAA Fisheries concurring with the effect determination of "may affect, but not likely to adversely affect" for species under the jurisdiction of NOAA Fisheries for the period of FY 2005-2009. USFWS concurred with the effect determination of "may affect, but not likely to adversely affect" for species under the jurisdiction of USFWS, via a letter/email dated December 16, 2003, for the FY 2005 dredging and disposal operations. Following recent confirmation of beneficial use at the Riverside Business Park areas, the Corps will reconsult with NOAA Fisheries and USFWS regarding the potential effects of upland disposal on listed species. The Corps will also annually reconsult with USFWS for dredging and disposal operations to be conducted under this Public Notice beyond FY 2005.

Previous dredged material analysis data from the downstream basin and channel indicates shoal material consists primarily of clean sands and silt. No water quality problems have been detected in conjunction with previous hydraulic pipeline or clamshell dredging in areas of proposed maintenance. The dredge material at the downstream settling basin has been determined suitable for open water disposal by the multi-agency Dredged Material Management Office (DMMO) suitability determination dated January 28, 2004. The dredge material at the upstream settling basin was sampled in March of 2004 to determine acceptance by DMMO for open water disposal.

Water quality effects are expected to be limited to the immediate areas of dredging and disposal and significant adverse effects on fisheries resources are not expected. A Section 401 Water Quality certification from the Washington Department of Ecology is being requested.

The decision whether to do the work will be based on an evaluation of the probable impact on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit, which reasonably may be expected to accrue from the proposal, must be balanced against its reasonably foreseeable detriments. All factors which may be relevant to the proposal will be considered; among those are: conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, flood plain values, land use, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, consideration of property ownership and, in general, the needs and welfare of the people.

PUBLIC HEARING

Any person who has an interest which may be affected by the disposal of this dredged material may request a public hearing. The request must be submitted in writing to the district engineer within the comment period of this notice and must clearly set forth the interest which may be affected and the manner in which the interest may be affected by this activity.

COMMENT AND REVIEW PERIOD

Comments on these factors will be accepted and made part of the record and will be considered in determining whether it would be in the best public interest to proceed with the proposed project. Comments should reach this office, ATTN: Navigation Section, not later than the expiration date of this public notice to ensure consideration. Requests for additional information should be directed to the Project Manager, Patricia Miller, at (206) 764-6908.

Patricia R. Miller, P.E.
Project Manager
Navigation Section

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
P.O. Box 47600 • Olympia, Washington 98504-7600
(360) 407-6000 • TDD Only (Hearing Impaired) (360) 407-6006

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY

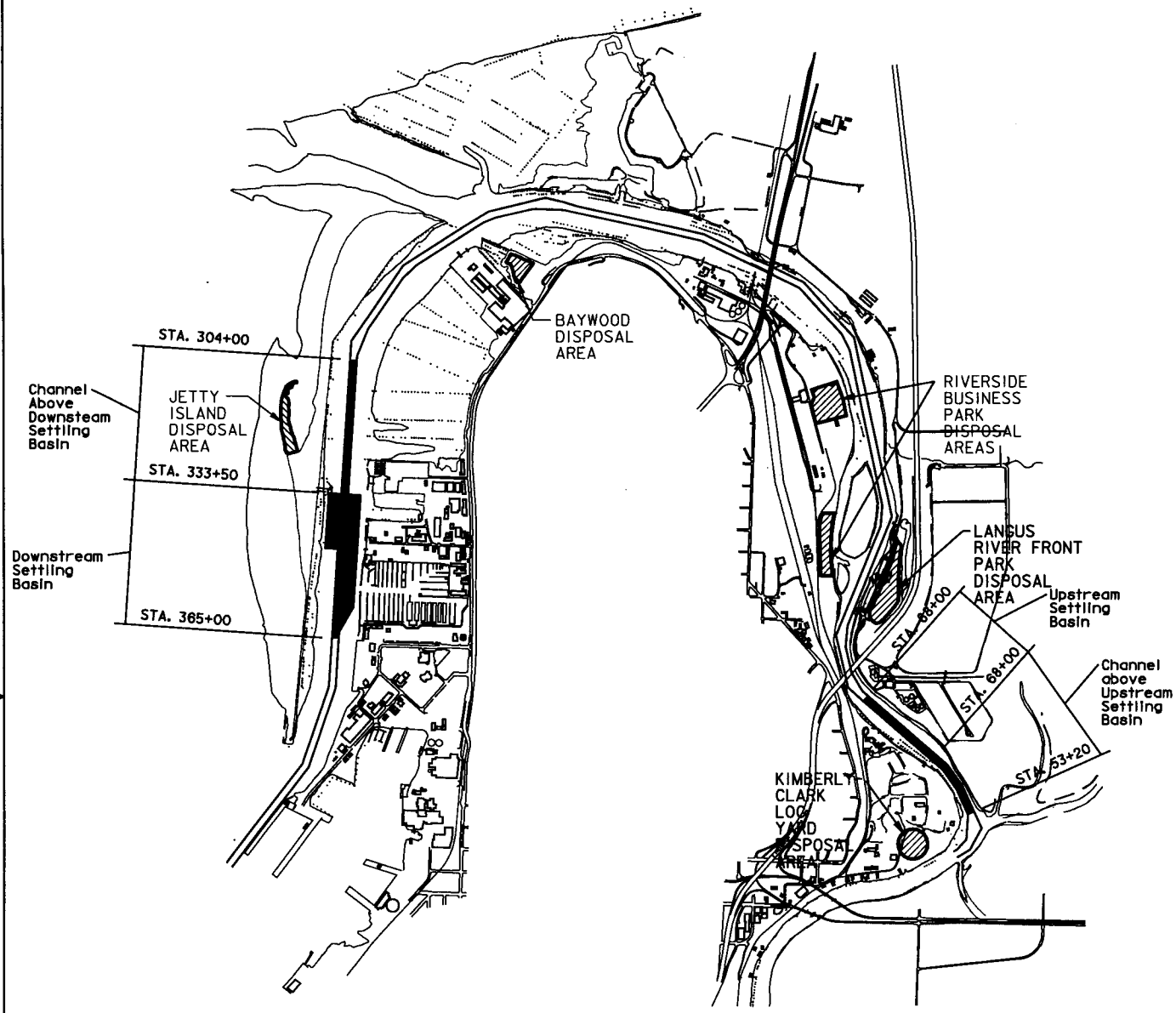
Notice of Application for
Water Quality Certification

Date: April 14, 2004

Notice is herby given that a request has been filed with the Department of Ecology, pursuant to the requirements of Section 401 of the federal Clean Water Act of 1977 (PL 95-217), to certify that the project described in the U.S. Army Corps of Engineers Public Notice No. OD-TS-NS-22 will comply with the Sections 301, 302, 303, 306, and 307 of the Act, and with applicable provisions of State and Federal water pollution control laws.

Any person desiring to present views on the project pertaining to compliance with water pollution control laws may do so by providing written comments within 30 days of the above publication date to:

Federal Permit Coordinator
Department of Ecology
SEA Program
Post Office Box 47600
Olympia, Washington 98504-7600



DREDGING AREA

PROPOSED DISPOSAL SITE

U.S. ARMY ENGINEERS DISTRICT, SEATTLE
CORPS OF ENGINEERS
Seattle, Washington

FISCAL YEARS 2005–2009
EVERETT HARBOR & SNOHOMISH RIVER, WA
MAINTENANCE DREDGING

DATE:	PUBLIC NOTICE:	SHEET 1 OF 3
15 MAR 04	CENWS-OD-TS-NS-22	

DATE AND TIME PLOTTED: 07-APR-2004 11:39

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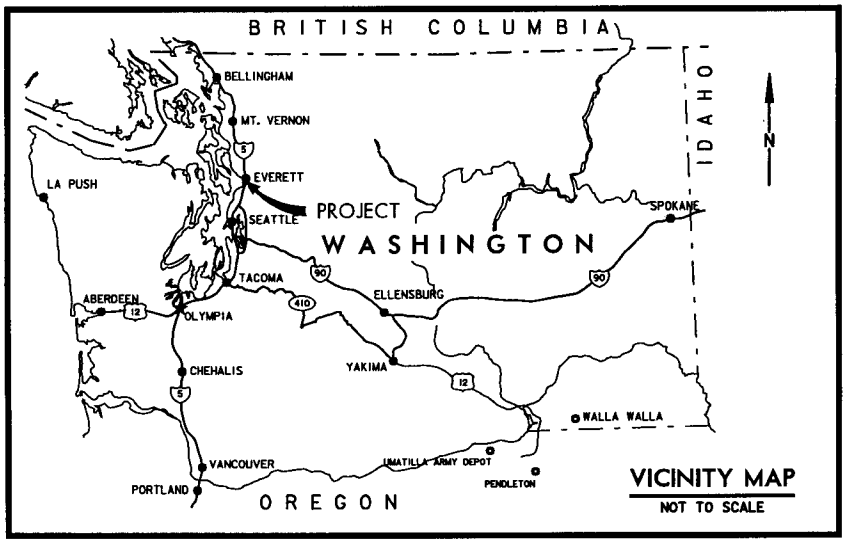

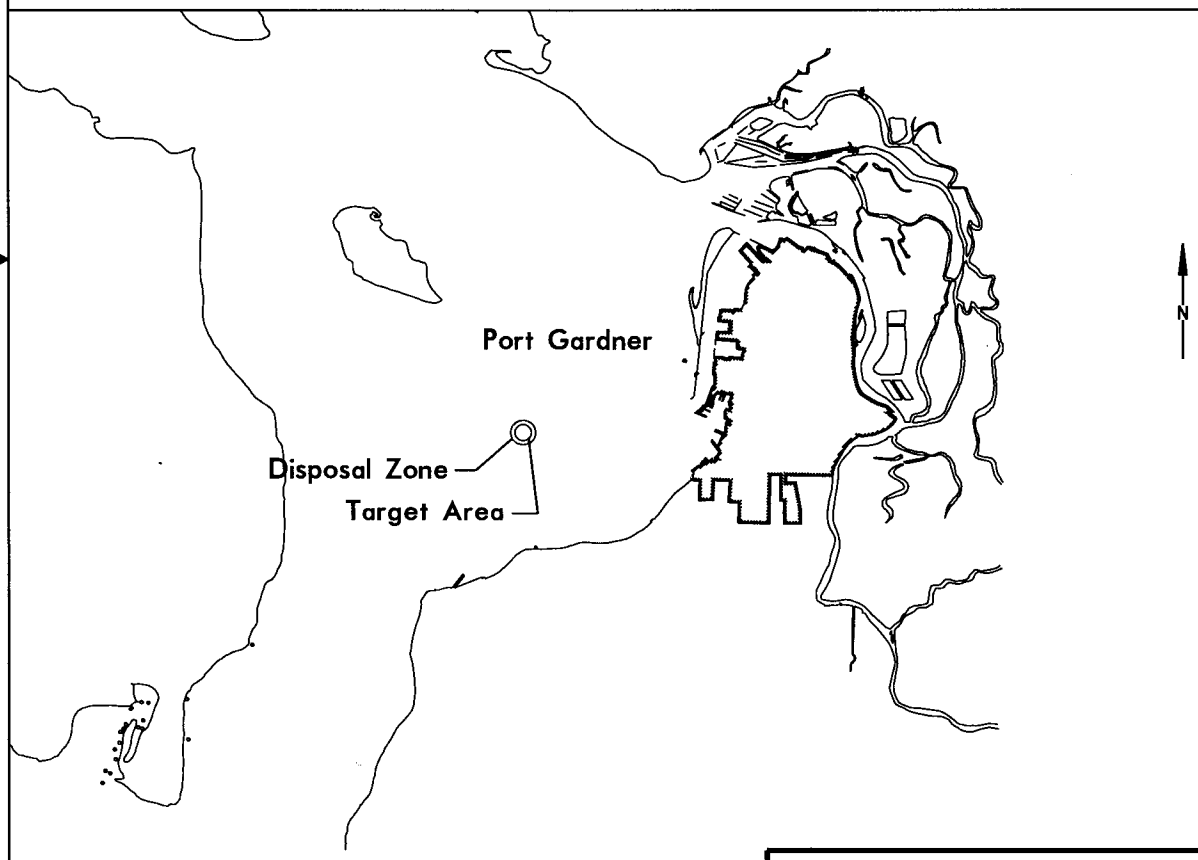

PORT GARDNER DISPOSAL SITE
TYPE: Nondispersive
AREA: 318 Acres
DEPTH: 420 ft.
DISPOSAL ZONE: 1800 ft. Diameter
TARGET AREA: 1200 ft. Diameter
BARGE POSITIONING METHOD: GPS
NAD 83 LOCATION: Lat 47° 58.85′
Long 122° 16.67′

U.S. ARMY ENGINEERS DISTRICT, SEATTLE
CORPS OF ENGINEERS
Seattle, Washington

FISCAL YEARS 2005–2009
EVERETT HARBOR & SNOHOMISH RIVER, WA
MAINTENANCE DREDGING

DATE:	PUBLIC NOTICE:	SHEET 2 OF 3
15 MAR 04	CENWS-OD-TS-NS-22	

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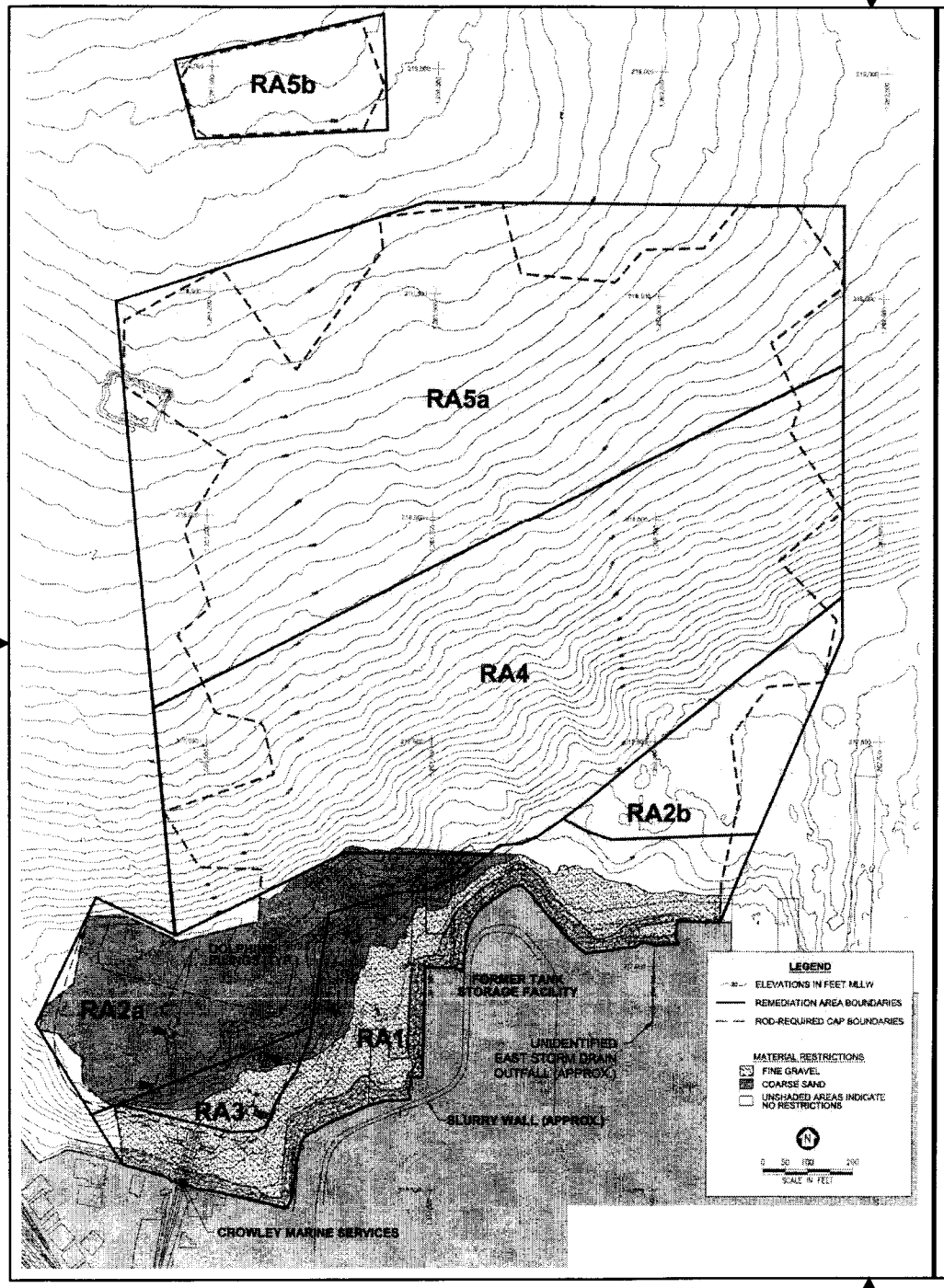

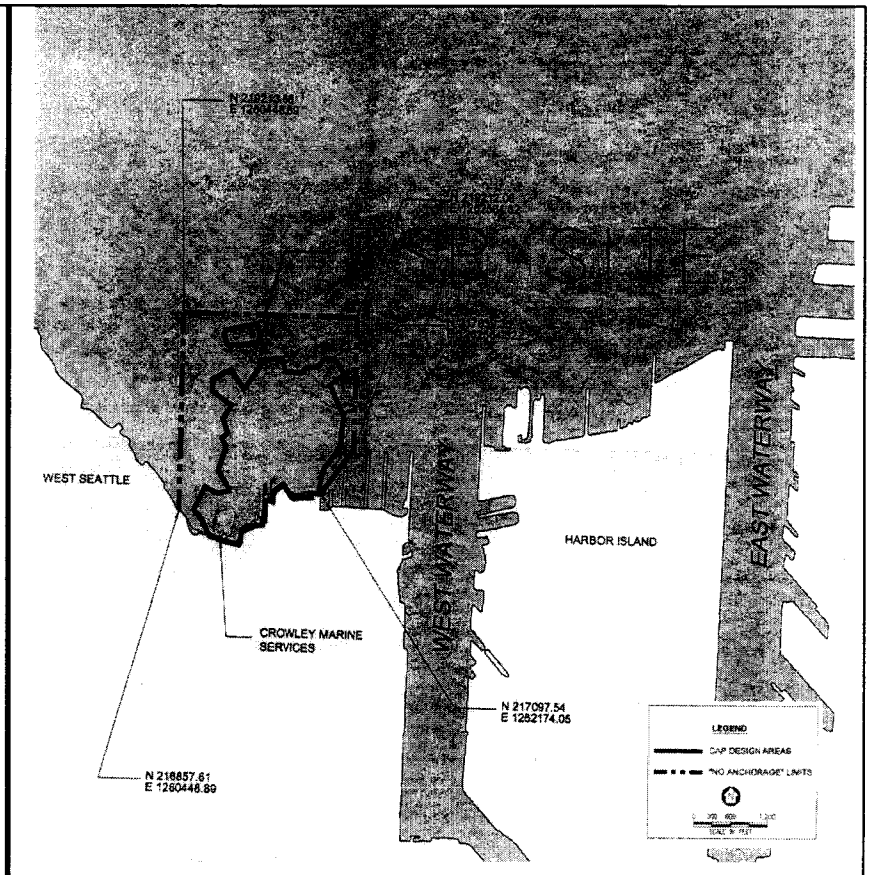

U.S. ARMY ENGINEERS DISTRICT, SEATTLE
CORPS OF ENGINEERS
Seattle, Washington

FISCAL YEARS 2005-2009
EVERETT HARBOR & SNOHOMISH RIVER, WA
MAINTENANCE DREDGING

DATE:	PUBLIC NOTICE:	SHEET 3 OF 3
15 MAR 04	CENWS-OD-TS-NS-22	

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APPENDIX D:

Finding of No Significant Impact

DEPARTMENT OF THE ARMY
SEATTLE DISTRICT, CORPS OF ENGINEERS
P.O. BOX 3755
SEATTLE, WASHINGTON 98124-3755

REPLY TO
ATTENTION OF

September 20, 2004

CENWS-PM-PL-ER

Fiscal Years 2005–2009 Maintenance Dredging, Snohomish River Navigation Channel, Downstream and Upstream Settling Basins, Everett Washington

Finding of No Significant Impact

1. Background. The Seattle District, U.S. Army Corps of Engineers (Corps), in partnership with the Port of Everett, is proposing to conduct maintenance dredging of the lower Snohomish River located along the City of Everett, Washington. The proposed maintenance dredging project encompasses dredging the lower 6.5 miles of the river channel including the downstream settling basin, the upstream settling basin and the adjacent portions of the navigation channel, disposal of dredged sediments via open water and upland disposal, as well as use of the sediments as a capping material.

2. Purpose and Need. The purpose of the proposed project is to maintain safe and reliable navigation within the lower Snohomish River by reducing the potential risks associated with shoaling in the navigation channel and settling basins. Without annual maintenance dredging, shoaling would lead to a shallower navigation channel and would reduce the depth of the settling basins, thus reducing the ability of large ships to enter and leave the Port of Everett safely and increasing the need for harbor dredging.

3. Action. The downstream settling basin and adjacent portion of the channel would be dredged in FY 2005 (between 16 October 2004 and 14 February 2005) using clamshell equipment and dredged materials loaded onto a bottom-dump barge. Sediments would be transported to the Puget Sound Resources (PSR) Superfund site in Elliott Bay to be used as capping material or to the Puget Sound Sediment Disposal Areas (PSSDA) open water disposal site. The total estimated volume available from the downstream settling basin and adjacent portion of the channel is approximately 260,000 cubic yards of sediment based on condition surveys conducted in spring of 2003.

The upstream settling basin and adjacent portion of the channel would also be dredged during the same time period in FY 2005. These areas would be dredged by hydraulic pipeline; the dredged material would be beneficially used for redevelopment of the Riverside Business Park site by directly placing the sediment onto the site. Clamshell dredging would be used to remove any remaining sediment for transport by bottom-dump barge to the PSR Superfund site or to the PSSDA open water disposal site. The total estimated volume available from the upstream settling basin and adjacent portion of the channel is approximately 200,000 cubic yards of sediment based on condition surveys conducted in spring 2004.

The Corps then proposes to dredge the downstream and upstream basins again in alternating years as conditions warrant through fiscal year 2009. Dredging and disposal activities would be repeated in the downstream basin in fiscal years 2006 and 2008 and in the upstream basin in fiscal years 2007 and 2009 under this action. Sediment would be dredged from the channel and the basins by either hydraulic pipeline dredge or clamshell dredge, depending on the proximity and characteristics of the disposal site. Preferential disposal options would favor beneficial use over open water disposal. Total volumes dredged between fiscal years 2005 and 2009 would not exceed the permitted maximum of 800,000 cubic yards from the upstream settling basin, 500,000 cubic yards from the downstream settling basin, and 200,000 cubic yards from the navigation channel, as presented in April 14, 2004 Public Notice CENWS-OD-TS-NS-22.

4. Summary of Environmental Impacts. Impacts from the dredging and disposal activities will generally be highly localized in nature, short in duration, and minor in scope. While there will be a loss of subtidal habitats for benthic invertebrates and demersal fish species, this loss is expected to be temporary as these areas continuously reshoal and benthic populations are expected to recolonize the dredged areas quickly. There would likely be small-scale, temporary increases in turbidity and decreases in dissolved oxygen within the river channel as a result of dredging activities. Increases in turbidity and dissolved oxygen impacts will be localized and temporary. There will be no loss of intertidal mudflat or marsh habitats. Impacts from this navigation project should not be significant, either individually or cumulatively.

In order to reduce these impacts and potential related effects on juvenile salmonids in the river, all ‘in-water’ construction work will take place between October 16 and February 14 of each year. Avoiding ‘in-water’ work during peak salmonid out migration periods (generally between February 15 and July 15) would minimize the short-term effects of the project on juvenile salmonids and allow for maximum recovery of the benthic, epibenthic, and forage fish communities prior to the subsequent year’s juvenile salmonid outmigration period. Beneficial use of the dredged sediments will have positive effects by capping contaminated sediments (at the PSR Superfund site), providing clean fill for redevelopment of formerly contaminated industrial sites (Riverside Business Park), and by renourishing eroding upland areas (Jetty Island).

No significant adverse impacts to fish and wildlife habitat, air quality, noise, aesthetics, historical resources, cultural resources, or the social or economic environment are anticipated as a result of the project.

The attached Final Environmental Assessment provides an evaluation of the proposed maintenance dredging and disposal project and its effects on the existing environment; it includes a Clean Water Act Section 401 Water Quality Certification and Coastal Zone Consistency Certification, a Section 404(b)(1) analysis, Endangered Species Act concurrence letters from the U.S. Fish and Wildlife Service and NOAA Fisheries Service, and the National Historic Preservation Act Section 106 compliance letter from the State Historic Preservation Officer.

5. Finding. For the reasons described above, I have determined that the maintenance dredging and disposal project will not result in significant adverse environmental impacts. The project will not constitute a major Federal action significantly affecting the quality of the human environment, and, therefore, does not require an environmental impact statement.

_____ _____

Date

Debra M. Lewis
Colonel, Corps of Engineers
District Engineer