SECTION 404(b)(1) EVALUATION
COLUMBIA RIVER CHANNEL IMPROVEMENT PROJECT

I. Introduction

Section 404 of the Clean Water Act (CWA) of 1977, as amended, requires that all projects involving the discharge of dredged or fill material into waters of the United States be evaluated for water quality and other effects prior to making the discharge. All disposal of dredged or fill materials associated with the Columbia River channel improvement project are activities undertaken by or at the direction of the Corps of Engineers. Federal regulations, at 33 CFR 336.1, provide that a Section 404 permit will not be issued for such discharges of dredged material by the Corps; however, the Corps shall apply the Section 404(b)(1) guidelines to the project. This evaluation assesses the effects of the discharge, as described below, for the Columbia River channel improvement project, utilizing guidelines established by the U.S. Environmental Protection Agency (USEPA) in conjunction with the Secretary of the Army under the authority of Section 404(b)(1) of the Act. This revised evaluation reflects currently available information and analysis, and supercedes all earlier 404(b)(1) evaluations, including Exhibit E to the Final *Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement*, dated August 1999 (Final IFR/EIS).

II. Description of Proposed Action

Proposed Action

The proposed action is to deepen the Columbia River portion of the Columbia and lower Willamette Rivers federal navigation channel from its current authorized 40- feet depth with advanced maintenance to 45-feet, to an authorized depth of 43-feet with advanced maintenance to 48- feet based on the recommendations in the Final *Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement*, dated August 1999 (Final IFR/EIS). Actions to deepen the Willamette River portion of the federal navigation channel have been deferred until completion of Superfund cleanup efforts and will be subject to a separate 404(b)(1) evaluation. Additional information and analysis of the project as currently proposed is provided in the Draft Supplemental *Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement*, dated July 2002 (Draft Supplemental IFR/EIS). The Final SEIS is expected to be released to the public in December 2002 with the issuance of a record of decision in February 2003. The actions to be specifically addressed under the guidelines include the following.

(1) Potential wetland fills at two sites totaling 16.1 acres. Both sites are located in Washington: 10.7 acres at Mt. Solo (W-62.0) and 5.4 acres at Puget Island (W-44.0).

(2) In-water (flowlane) disposal for the 43-foot channel alternative includes 3 million cubic yards (mcy) for construction and 24 mcy of maintenance material during the first 20 years. Flowlane disposal sites are in or adjacent to the Columbia River federal navigation channel in both Oregon and Washington at depths generally ranging from 50 to 65 feet. New

flowlane disposal areas will be used at depths below 65 feet and above 35 feet at locations described in Section II(c) below.

(3) Placement of material at 3 beach nourishment sites: Sand Island, Oregon, Skamokawa Beach, Washington, and Miller Sands Spit, Oregon. Sump locations at Columbia River Mile (CRM) 21 (Harrington Sump) and at CRM 18-20 (Tongue Point, Oregon) would also be used for placement of dredged material.

(4) In-water placement of dredged material for restoration of intertidal emergent marsh habitat at Martin Island embayment, Washington.

(5) In-water placement of dredged material for restoration of tidal marsh-intertidal flat habitat at Lois Island embayment, Oregon, and at Miller/Pillar between Pillar Rock and Miller Sands Islands, Oregon.

(6) Two restoration measures (interim and long-term) are being considered at Tenasillahe Island, Oregon. The interim actions would be directed at improving connectivity and water exchange between sloughs/backwater channels interior to the levees at the Julia Butler Hansen National Wildlife Refuge and the Columbia River. The interim measure includes construction of two temporary cofferdams at existing tidegates to allow installation of improved outlet structures in a "dry" environment. These improved outlet structures would improve fisheries access and egress. Inlet improvements, channels, and water control structures would be constructed at three locations to direct Columbia River waters into the interior sloughs to improve fisheries access and improve water quality and circulation in the interior sloughs.

(7) The long-term measure at Tenasillahe Island involves breaching the flood control levee surrounding Tenasillahe Island at five locations. These breach locations include the two existing tidegates and the three proposed inlet sites for the interim restoration measures. This action will improve conductivity of interior channels and restore tidal circulation to approximately 1,778 acres of estuarine habitat; a substantial gain in salmonid habitat is envisioned.

(8) Tidegate retrofits for salmonid passage at Burris Creek in Woodland Bottoms, Washington.

(9) The Shillapoo Lake, Washington, ecosystem restoration feature creates waterfowl and wildlife habitats on 470 to 839 acres. The concept for the restoration feature would be to create cells hydraulically separated by levees, but interconnected by water control channels and structures. This will require modifications to the outlet structure involving excavation and/or fill and emplacement of a porous rock levee to block carp access to the wetland management cells comprising the project feature.

(10) Development of managed wetland habitat at the Webb and Woodland Bottoms mitigation sites.

Purpose and Need

As originally stated in the Final IFR/EIS, the purpose of the proposed project is to improve the deep-draft transport of goods on the Columbia and lower Willamette Rivers navigation channel, and to provide ecosystem restoration for fish and wildlife habitats. As noted above, actions to deepen the Willamette River portion of the federal navigation channel have been deferred until completion of Superfund cleanup efforts. The planning period for the project is 50 years. For purposes of Section 404(b)(1) analysis, deepening of the authorized navigation channel is a water dependent activity.

The need for navigation improvements has been driven by the steady growth in-waterborne commerce on the Columbia River and the use of larger and more efficient vessels to transport bulk commodities, which comprise the majority of export tonnage shipped. With the increased use of deep-draft vessels for transport, limitations posed by the existing channel dimensions now occur with greater frequency. Ships with design drafts near the 40-foot depth constraint cannot fully utilize their carrying capacity. Also, water depth availability problems cause vessel delays. By improving navigation, the opportunity to realize greater National Economic Development (NED) benefits (limited to a maximum authorized depth of 43 feet) would result from reducing transportation costs by allowing deep-draft vessels to carry more tonnage, and by reducing vessel delays.

The ecosystem restoration component covered by this evaluation was scoped and coordinated with state and federal agencies in accordance with Corps Engineers' Circular 1105-2-210, dated June 1, 1995, *Ecosystem Restoration in the Civil Works Program*.

Additional ecosystem restoration features and research and monitoring actions resulting from consultation of the project under Section 7 of the Endangered Species Act (ESA) have been incorporated into the project since publication of the Final IFR/EIS. The additional ecosystem restoration features and research and monitoring actions are based on opportunities identified to enhance juvenile salmonid feeding and rearing habitat for listed salmonid species. The primary purpose of these ecosystem restoration features is to restore habitat conditions for salmonids and other listed species, which would contribute to the recovery and long-term viability of the listed species. These features also would provide benefits to many other species of fish and wildlife.

General Description of Dredged or Fill Material

The material to be dredged and disposed as part of the Columbia River channel deepening and maintenance is predominately medium grain sand with some fine and coarse grain sand. The proposed 43-foot deepening alternative would result in flowlane disposal of an estimated 3 mcy during construction and an estimated 24 mcy over the first 20-years of maintenance. This maintenance quantity is estimated to be 20-30 mcy less than if current dredging and disposal practices were continued.

As described in Section 5.1.7 of the Final IFR/EIS, since the 1930s, the Corps has collected sediment data on the Columbia and Willamette Rivers. A comprehensive Sediment Quality

Evaluation was prepared for the study (See Appendix B of the Final IFR/EIS). Since issuance of the Final IFR/EIS, the Corps has reviewed the analysis of thousands of collected samples from within and outside the channel. The likelihood of contaminants in the Columbia River portion of the federal navigation channel is low based upon all of the past testing and evaluation discussed in the Final and Supplemental IFR/EIS. All material dredged will be evaluated under joint USEPA and Corps Dredged Material Evaluation Guidelines prior to disposal. The Sediment Quality Evaluation and compliance with USEPA/Corps Guidelines prior to dredging meet the evaluation and testing requirements of 40 CFR Part 230 Subpart G.

Ecosystem restoration activities at Tenasillahe Island, Shillapoo Lake, and the tidegate retrofit at Burris Creek will include the construction of cofferdams and levees. The fill material used for these activities will consist of clean sand and/or insitu material. A porous rock dam will also be constructed at Shillapoo Lake.

Mitigation at Webb and Woodland Bottoms will include construction of levees with insitu material.

Description of the Proposed Discharge Sites

Flowlane sites are in or adjacent to the Columbia River federal navigation channel at depths generally from 50 to 65 feet. However, there would be exceptions to the general depth criteria for the channel improvement project. The actual disposal sites cannot be designated beyond the general description in the first sentence of this section. They vary from year to year depending on the condition of the channel. Flowlane disposal could occur at depths of 35 to 65 feet between CRMs 64 and 68 and CRMs 90 and 101. Flowlane disposal could occur in areas over 65 feet deep in four specific areas: downstream of CRM 5; CRMs 29 to 40; CRMs 54 to 56.3 on the Oregon side of the channel; and CRMs 72.2 to 73.2 on the Washington side. The substrate at these locations is predominately medium grain sand with some fine and coarse grain sand.

The two wetland discharge sites total approximately 16.1 acres. Both sites are located in Washington [10.7 acres at Mt. Solo (W-62.0) and 5.4 acres at Puget Island (W-44.0)]. These sites lie behind flood control levees, and are drained and used for a variety of agricultural purposes.

Harrington Sump is a deepwater (~-40 feet CRD) site located between RM 20-22 in Oregon waters that historically and currently is used for placement of dredged material by hopper dredges. The sandy substrate at this location is comparable to the dredged material placed there. The sump is typically filled over a 2-3 year period, to approximately 35 ft CRD and then dredged to approximately 45 foot CRD with material disposed on Rice Island.

The temporary (2-year) sump to be used near Tongue Point (CRM 18-20), on the Oregon side, and immediately adjacent to the navigation channel, occurs in-water 38 to 60+ feet deep. The sandy substrate at this location is comparable to the dredged material to be placed there from the adjacent navigation channel.

The three sites selected for beach nourishment Sand Island, Oregon, Skamokawa Beach, Washington, and Miller Sands Spit, Oregon. are non-vegetated erosive shoreline areas with sandy substrate.

The Lois Island embayment totals 357 acres, and was dredged as a mooring basin for decommissioned WWII ships. This restoration action would restore approximately 190 acres of the embayment to marsh habitat. The existing substrate averages about -18 feet CRD and consists of predominately medium grain sand with some fine and coarse grain sand. The Miller/Pillar restoration feature between Pillar Rock and Miller Sands Islands is approximately 230 acres. The existing substrate averages about -25 feet CRD and consists of predominately medium grain sand with some fine and coarse grain sand. Since the site is naturally erosive, a pile dike field would be constructed to stabilize the site and maintain bathymetry comparable to pre-erosion conditions. A stable bathymetry at historic depths is anticipated to improve benthic invertebrate productivity and fisheries resource use.

The Martin Island embayment is an approximately 34-acre area formed via excavation of material to provide fill for an adjacent portion of Interstate 5, and was subsequently used for log moorage and recreational boating, including moorage. The average depth of the embayment is approximately -20 feet CRD. Silt that settled in this quiet backwater and bark debris from log storage activities likely make up the bottom substrate.

The Tenasillahe Island (interim) sites affected by temporary cofferdam construction are silty to fine sand substrates at 2 to 4 foot depths. The inlet structures would principally entail construction through the flood control levee with minor construction activities in adjacent intertidal lands with a silt substrate. Long-term activities at Tenasillahe Island would include breeching the levees to restore full tidal circulation.

Tidegate retrofits proposed at the five primary locations would primarily entail construction work in levee material with a minor construction element potentially in the adjacent intertidal zone comprised primarily of silts.

Construction actions associated with the Shillapoo Lake ecosystem restoration feature would primarily occur interior to the main flood control levee on agricultural lands. Some construction work would occur in levee material with a minor construction element potentially in the adjacent intertidal zone comprised primarily of silts. Sediment discharge to adjacent waters would be minimal. Rock fill would occur in the existing discharge channel from the pump station to serve as a carp access barrier to the interior managed wetlands.

The Webb and Woodland Bottoms mitigation sites will be developed for wetland and riparian habitat by constructing low levees inside the main flood control dike and constructing gradual sloping banklines within the mitigation sites.

III. Alternatives

The project alternatives were described and analyzed in Chapter 4 of the Final IFR/EIS and draft Supplemental IFR/EIS [no action, non-structural, and structural (channel deepening at 41, 42, and 43 feet), and disposal alternatives]. Alternatives other than the 43' deepening alternative were screened out on a number of grounds. The 41 and 42-foot alternatives were eliminated because they failed to maximize NED benefits. The regional port alternatives were eliminated because of higher anticipated construction, transportation or environmental costs. The non-structural / LoadMax alternative has been fully developed and implemented.

As required by the 404(b)(1) guidelines, a detailed evaluation of disposal alternatives, including upland and flowlane disposal and shoreline disposal, was performed in conjunction with preparation of the Final IFR/EIS. All practicable alternatives to the proposed disposal sites were studied with the coordination and cooperation of Federal and state resource agencies. Refinements to the disposal plan have been made since issuance of the Final IFR/EIS to further reduce impacts to wetlands. As discussed in the Final and Draft Supplemental IFR/EIS and below, practicable alternatives to the proposed in-water disposal areas and the two affected wetland sites do not exist.

The Supplemental IFR/EIS describes ecosystem restoration features in addition to those proposed in the Final IFR/EIS (Tidegate Retrofits, Improved Embayment Circulation [Walker/Lord Islands and Fisher/Hump Islands], and Shillapoo Lake). The additional restoration features include Lois Island Embayment, Miller/Pillar, Tenasillahe Island (interim and long-term features), Purple Loosestrife Control Program, Cottonwood/Howard Island Columbian White-tailed Deer Reintroduction, and Bachelor Slough Aquatic Restoration. The additional ecosystem restoration features were developed through the ESA consultation process with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS) for ESA-listed salmon and other species as well as generally restoring fish and wildlife habitat.

a. Upland Disposal Sites (Includes two Wetland Sites)

The process used for screening upland disposal sites is described in Section 4.4.3.4 of the Final IFR/EIS. Over 157 sites were reviewed. Multiple environmental and engineering criteria were applied to screen the sites and select those proposed for disposal of project dredged materials.

One of the environmental criteria applied was avoidance of wetlands to the extent practicable. As a result of the screening process, comments on the draft EIS, and subsequent adjustments in disposal site boundaries, the total area of wetland fill was reduced from 30 acres for the plan evaluated in the draft EIS to 16.1 acres in the current recommended plan.

The two areas of wetland fill, 10.7 acres at Mt. Solo and 5.4 acres at Puget Island, are in river areas where the in-water disposal capacity is insufficient to handle the amount of material to be dredged. No other practicable means exists for disposing of dredged material without impacting a comparable or greater amount of wetland habitat. Other upland or in-

water sites are not available in the vicinity or are already being used to capacity. The disposal sites containing wetland habitat lie behind flood control dikes, are actively drained and are used for agricultural purposes. These wetlands provide limited wildlife habitat value. The Puget Island and Mt. Solo disposal sites lie behind flood control dikes and are outside the Federal Emergency Management Agency 100-year floodplain.

b. In-water Disposal

Flowlane disposal is used in areas where no other disposal alternatives exist or where the quantity of material to be dredged is too small to warrant use of a pipeline dredges that would be necessary for upland disposal. Flowlane disposal is not expected to have a significant impact on aquatic resources. Benthic invertebrate productivity is generally low in the deeper channel areas and impacting these areas would not affect the overall productivity of the Columbia River.

Shoreline disposal locations were selected because of beneficial use that they provide. Sand Island protects a county/public park and riparian habitat. Skamokawa beach provides the resale of material and protects the public beach. Miller Sands protects an important aquatic habitat.

The Harrington Sump is necessary in the estuary in order to eventually place material upland on Rice Island. The Rice Island upland disposal site is located within the estuary adjacent to Harrington Sump. Material is temporarily placed in the sump when river conditions or equipment availability does not allow direct placement of material on Rice Island. Pipeline dredges later remove the material from Harrington Sump and place it upland for permanent disposal. The sump has been used for decades and is a disturbed area with low productivity. Use of Harrington Sump reduces the need for flowlane disposal elsewhere in the estuary. The Tongue Point Sump is to be used during construction to temporarily store disposal material that will ultimately be placed on the Lois Island ecosystem restoration site by a pipeline dredge.

Two ecosystem restoration sites will be constructed utilizing dredge material in the estuary to help restore valuable habitat. The Lois Island embayment will be filled with material to an elevation approx 7 feet mllw in order to develop tidal marsh habitat. This action would occur during the two-year construction period. The Miller Pillar ecosystem restoration feature will restore subtital and/or intertidal habitat in a naturally erosive area. Both of these restoration sites have been identified through the ESA consultation as beneficial to listed salmonid stocks.

The mitigation habitat development at the Martin Island embayment will also utilize dredged material to accomplish the habitat objective. Project mitigation, including mitigation for wetland impacts such as the proposed creation of intertidal emergent marsh at Martin Island, was developed through an interagency team approach. The mitigation team included representatives from the Corps, Washington Departments of Ecology and Fish and Wildlife, US Fish and Wildlife Service, and Oregon Department of Fish and Wildlife.

c. Other Restoration

The ecosystem restoration features described in the Final IFR/EIS that involve discharges of dredged or fill material into the waters of the U.S. include Tenasillahe Island and Shillapoo Lake. The purpose of these restoration features is to benefit listed ESA species, including salmonid ESUs and also to improve fish and wildlife habitat conditions. The Shillapoo Lake restoration feature and the Burris Creek tidegate retrofit feature were formulated as the result of a series of workshops with federal and state resource agencies. Tenasillahe Island restoration was a result of the ESA consultation process between the Corps, NMFS and USFWS. The discharges that are a part of these features are necessary in order to realize the purpose of the features. There are no practicable alternatives to these discharges.

d. Other Wildlife Mitigation

The wildlife habitat mitigation described in the Final IFR/EIS that involve discharges into the waters of the U.S. includes Martin Island (Martin Island embayment was addressed in paragraph b above), Woodland Bottoms, and Webb mitigation sites. The purpose of these wildlife mitigation actions is to offset project-related wildlife habitat losses for riparian, wetland and agricultural lands. These mitigation actions were developed through an interagency process (WDFW, ODFW, USFWS, WDOE and COE) utilizing the USFWS's Habitat Evaluation Procedures to assess project related losses and net gains in habitat units at potential mitigation sites. The selected mitigation sites produced the best net gain in habitat units at the least cost. The discharges that are a part of these mitigation actions are necessary in order to attain the wildlife habitat improvements. There are no practicable alternatives to these discharges.

IV. Factual Determinations (40 CFR § 230.11)

Physical Substrate Determinations

Sediments in the mainstem Columbia River typically are composed of fine to course sand with less than 1% in the silt to clay size classification and less than 1% volatile solids. The dredging sites within the navigation channel, access channels, and all flowlane disposal sites and sumps are located within the mainstem of the Columbia River. Flowlane disposal sites are typically located near associated dredging sites and are subject to similar hydraulic forces. The riverbed generally consists of sand waves that have minimal compaction or consolidation. Therefore, the materials in the extraction sites and the substrate of the in-river discharge sites are similar in particle size, shape and compaction.

The disposal of dredged material would alter the depth and/or gradient of the flowlane disposal sites and sumps via raising the bottom elevation. As previously noted, the disposal location and depth of flowlane sites cannot be determined until shortly before the time of discharge due to the dynamic nature of the river bottom. However, rise in bottom elevation is expected to range from two to six feet depending on individual flowlane sites. This range of rise is not expected to cause significant changes in-water circulation, current pattern, water fluctuation and water temperature. The elevation rise in the disposal sites may affect

the contours of the surrounding substrate; however, any such affect is expected to be insignificant. The physical characteristics of bottom sediments would not change significantly as the dredged material is essentially the same composition as material found at the discharge site.

The substrate of both disposal sites containing wetland habitat is primarily silty clay loam. Placement of dredged material at the sites would change the physical composition to primarily sand. The top one foot of topsoil would be removed at the Puget Island disposal site would be removed and stockpiled prior to deposition and then replaced on the surface as each of the three disposal cells at the location are filled. All wetland function and value will be lost at these locations; therefore, these wetland discharges will not be addressed any further under these factual determinations.

The sandy substrate of the three-shoreline disposal sites is the same as the material that will be placed there. Disposal will raise the riverbed of shallow water areas along the beach. Some areas could change from shallow water to beaches. Disposal would erode away in three to four years. All of these sites have been used in the past to maintain the Columbia River. These sites tend to be non-vegetated erosive sites with low benthic productivity. There are no expected impacts to downstream habitat as a result of these sites.

The substrate of the two ecosystem restoration sites and one wildlife mitigation site utilizing dredged material for fill ranges from coarse sand to silt. Placement of dredged material at Miller/Pillar would raise the bottom elevations from 6 to 24 feet with predominately medium grain sand with some fine and coarse grain sand. For Lois Island embayment, the elevation increase would range from 1 to 32 feet and average about 24 feet. The bottom elevation of Martin Island embayment would rise approximately 20 feet to an intertidal level post-construction.

Implementation of the interim measure at Tenasillahe Island would result in a temporary modification to the physical substrate associated with placement of cofferdams established to allow construction in the dry. These structures would be removed once the outlets are modified. The improved outlets are not anticipated to modify the physical substrate at the outlets beyond existing condition. Some modification to the substrate will occur at the three inlet works to be established. These may include excavation of entrance and exit channels either mechanically or in combination with hydraulic forces associated with the initiation of flows at these locations.

The long-term restoration measure at Tenasillahe Island will entail breaching (excavation) the flood control levee at the two existing outlets and three proposed inlet locations associated with the interim measure. The restoration of tidal flows to the interior of Tenasillahe Island may result in the natural development of channels and/or modification to the existing drainage channels and substrate from the reintroduction of hydraulic forces. Disposal of excavated material from the breaches will be atop the remaining levee section to the extent practicable but deposition on interior lands that are currently pastures (drained wetlands) may occur, subject to further evaluations, for development of riparian forest habitat.

Tidegate retrofits at Burris Creek would have minimal impacts to the existing substrate. Typically, construction earthwork would be limited to the flood control levee if it proceeded beyond a simple replacement or modification of the tidegate at the end of the culvert. No change in the existing condition of the surrounding substrate due to changes in flow is anticipated with these modifications.

The Shillapoo Lake ecosystem restoration feature will entail construction of water control levees interior to the main flood control levee and modifications to the outlet works. The interior levees are per the Washington Department of Fish and Wildlife's management desires for the presently agricultural and Shillapoo Wildlife Management Area lands comprising the restoration feature. Structural modifications to the present outlet works will primarily encompass the flood control levee with minor disturbance to the outlet channel to Lake River. Another project feature entails placement of a porous rock fill (levee) across the outlet channel to block carp access to the interior managed wetlands. The substrate of the area is composed of silty clay loam. The levees will be constructed from these native soils.

The discharges at the Webb and Woodlands Bottoms mitigation sites will use clean sand and insitu materials, and will not adversely impact the existing substrate.

The cumulative impacts of other ongoing and currently authorized activities involving discharges of dredged or fill material that potentially affect physical substrate (e.g., existing filling and diking, ongoing maintenance dredging, maintenance of the mouth of the Columbia River, operation of the Federal Columbia River power system, and existing development along the Columbia River) are reflected in the current substrate conditions found at the sites discussed above. Future activities, including potential future upland development, are not anticipated to affect physical substrate except in the immediate vicinity of such projects. While future cleanup of the Willamette River under the federal superfund program could potentially affect substrate in a limited area downstream of the Willamette's confluence with the Columbia, the cleanup plan has not been developed yet and therefore the potential effect of the cleanup cannot be predicted at this time.

Water Circulation, Fluctuation and Salinity Determinations

The proposed in-water disposal, including flowlane, two sumps, and shoreline disposal, would affect minor changes in hydrologic features such as circulation patterns, downstream flows, or normal water level fluctuations. Discharges at shoreline disposal sites are intended to offset shoreline erosion. However, the minor changes in hydraulic features are not expected to otherwise result in any significant impacts to aquatic communities, shoreline and substrate erosion and deposition rates, the deposition of suspended particulates, the rate and extent of dissolved and suspended components of the water body. Water quality characteristics such as water chemistry, clarity, color, odor, taste, dissolved gas levels, temperature, or nutrients would not be affected to any measurable degree. As discussed in Sections 6.2.2.2 and 6.2.2.3 of the Final and Supplemental IFR/EIS and Appendix F of the Final IFR/EIS, channel deepening and related disposal could cause a minor increase in salinity in the main channel in the lower part of the estuary. The hydraulic analysis of water

surface elevations and salinity concentrations support the expectations of minor changes. Since the water surface profiles and thus the energy gradients are essentially unchanged, the flow in side channels and shallows would also be unchanged. The results of salinity intrusion modeling show insignificant changes in salinity concentrations outside the main channel. This result indicates that there would be very little hydraulic change away from the main channel. Based on the results of sediment analysis [see subpart (d) below], and that dredged material would originate from nearby in-water locations, physical or chemical characteristics of the receiving water would not be adversely affected. Additional analysis of salinity and hydraulic effects, including potential minor changes in the location of the Estuarine Turbidity Maximum (ETM) associated with deepening (as opposed to disposal of dredged or fill material), is included in the Supplemental IFR/EIS.

The proposed restoration actions at Tenasillahe Island, and the tidegate retrofits at Burris Creek are intended to improve water circulation within these sloughs, backwaters and embayments. The creation of tidal marsh habitat within the Lois Island embayment is not anticipated to alter flow or water circulation patterns in the adjacent area. The placement of a pile dike field and subsequent fill between the pile dikes at Miller/Pillar to restore subtidal and or intertidal elevations would have a negligible impact to flows into lower Cathlamet Bay. The porous rock levee across the outlet/inlet for the Shillapoo Lake restoration effort is intended to maintain flow through the existing tidegate and pumping station at this location but preclude the passage of carp to the interior managed waters.

The creation of the intertidal habitat in the Martin Island embayment is in a protected area and is therefore not expected to alter circulation patterns adjacent to this site. The discharges at the Webb and Woodlands Bottoms mitigation will occur behind the main flood control dikes and will have no effect on water circulation, fluctuation and salinity.

The cumulative impacts of other ongoing and currently authorized activities involving discharges of dredged or fill material that potentially affects water circulation, fluctuation and salinity are reflected in the current conditions described in the Final and Supplemental IFR/EIS. Future activities, including potential future upland development, are not anticipated to affect water circulation, fluctuation or salinity except in the immediate vicinity of such projects. While future cleanup of the Willamette River under the federal superfund program could potentially affect water circulation, fluctuation and salinity in a limited downstream area, the cleanup plan has not been developed yet and therefore the potential effect of the cleanup cannot be predicted at this time.

Suspended Particulate/Turbidity Determination

Hopper dredges discharge through doors in the bottom of the hull while under power and traveling at slow speeds, generally around 1 or 2 knots. Hopper dredges typically discharge their load in a 5-20 minute period. A hopper dredge may make 6-15 disposal cycles per day. Loaded draft depths for hopper vessels vary with their capacity but will typically fall in the 15-30 foot depth range which is essentially the range for load discharge. The hopper dredges generates a turbidity plume that is limited in extent to the area below the discharge depth and immediately along the vessel path for the 5-20 minute disposal effort. The discharged sand settles quickly to the river bottom. The sediment concentrations in the plume are

limited because of the small amount of fines in the disposal material. River currents will carry the plume a short distance before it mixes with the river.

For pipeline dredges, dredged material is continuously pumped through a discharge diffuser that is located 20 feet below the water surface. The discharged sand settles rapidly to the bottom and a plume of fine grained sediments is carried away by the river currents. The downstream extent of the plume will depend on the river velocities and channel geometry at each discharge site.

Short-term minor increase in turbidity would occur in the mixing zones of Project in-water disposal sites and in-water work areas associated with mitigation and ecosystem restoration features. This condition would temporarily inhibit light penetration through the water column for a short period of time (hours) and would not significantly affect aquatic organisms. The dredging and disposal activity in the Project will involve the same type of sandy material, and will be performed with the same type of equipment and the same method of operations, as existing maintenance dredging of the 40-foot channel. Both states have previously issued state water quality certifications that have included approved mixing zones. With the issuance of state water quality certifications containing approved mixing zones and/or short-term modifications as appropriate, the expected increase in turbidity levels would not violate state water quality standards. Best management practices (BMP) would be utilized for the dredge and fill actions associated with the deepening and all in-water disposal, as well as the Lois Island embayment, Miller/Pillar ecosystem restoration features and Martin Island embayment development for wildlife mitigation. Best management practices would also be implemented for other ecosystem restoration features entailing work in-water, including construction of temporary cofferdams to contain and allow settling time for suspended sediments at Tenasillahe Island, and potentially for the Burris Creek tidegate retrofits. The BMP's are described in the BA and BO. See further discussion in Chapters 4 and 6 of the Final and Supplemental IFR/EIS.

All other discharges will occur in wetland areas. These discharges are not expected to involve flowing or standing water where turbidity would be an issue.

The cumulative impacts of other ongoing and currently authorized activities involving discharges of dredged or fill material that potentially affect suspended particulates and turbidity are reflected in the current conditions described in the Final and Supplemental IFR/EIS. Future activities, including potential future upland development, are not anticipated to affect suspended particulates or turbidity except in the immediate vicinity of such projects. While future cleanup of the Willamette River under the federal superfund program could potentially affect suspended particulates and turbidity in a limited downstream area, the cleanup plan has not been developed yet and therefore the potential effect of the cleanup cannot be predicted at this time.

Contaminant Determinations

With the exception of some discharge of materials associated with the mitigation sites and several of the ecosystem restoration features (Tenasillahe Island, Burris Creek tidegate retrofit, Shillapoo Lake), all of the material proposed to be discharged pursuant to this

404(b) evaluation is dredged material from the navigation channel and from existing access channels between the navigation channel and shoreside berths at three grain facilities, one gypsum plant and one container terminal. Actual deepening of these berths will require separate Section 404 permitting and review.

The discharges into the mitigation sites and several ecosystem restoration sites that do not involve material dredged from the navigation channel will be either insitu material or clean sand or rock from non-contaminated sources. Currently available information indicates no reason to suspect contaminants in the insitu material.

Sediments in the mainstem Columbia River typically are composed of sand with less than 1% in the silt to clay size classification and less than 1% volatile solids. The material present in the mainstem Columbia River meets exclusionary criteria as defined under the Marine Protection, Research, and Sanctuaries Act (MPRSA) and the CWA and, therefore, would not be subject to further testing under these two environmental laws. However, this material has been subjected to both physical and chemical testing as part of this project. The mainstem sediment has been determined, in accordance with the 1998 Dredged Material Evaluation Framework (DMEF), Lower Columbia River Management Area (USEPA/COE 1998), to be suitable for unconfined in-water disposal by the USEPA, Corps, and the States of Oregon and Washington.

Sediment testing still will be required for material dredged from the turning basin at Astoria. The evaluation would be conducted by and coordinated with the appropriate agencies prior to any dredging and disposal action.

Material from the areas dredged in the Columbia River has been collected and analyzed since dredging first began in the early 1900s. Prior to the passage of the MPRSA and CWA physical analyses was conducted to determine dredging capability and to estimate production. After passage of these two environmental laws, analyses were expanded to include chemical and biological analyses as well as the traditional physical analyses. Physical analyses are also conducted as a regular parameter evaluated during benthic infauna studies conducted in the river. Many of these infauna studies have been conducted along the slopes and outside of the navigational channel during dredged material disposal site evaluation studies. The Corps has identified and is entering into a SEDQUAL database over 100 separate studies that have been conducted on the Columbia River by the Corps since 1980. This includes sampling of over 3,100 stations for a total of over 4,100 samples.

While the nature of the mainstem material meets the exclusion from testing as provided in the regulations and evaluation guidelines, the Corps and USEPA decided to conduct confirmatory testing for the entire project. Sixty-seven separate shoal areas were identified for sampling through assessment of the of the 1994 navigation channel bathymetry. In June 1997, 89 surface grab samples were collected from the 67 shoals in the Columbia River project area (CRMs 3.0 to 106.2). In addition to physical analysis, 23 were further analyzed for chemical contaminants.

As in accordance with the DMEF, chemical tests were performed including; inorganic total metals (9), polynuclear aromatic hydrocarbons (PAHs), total organic carbon (TOC), total volatile solids (TVS), acid volatile sulfide (AVS), pesticides and polychlorobiphenyls (PCBs), pore water tributyltin (TBT), and P450 reporter gene system (RGS), a dioxin/furan screen. Information regarding the sediment testing and results can be found in Appendix B of the Final IFR/EIS, *Columbia and Willamette River Sediment Quality Evaluation*. The dredged material was determined to be suitable for unconfined in-water disposal.

Additional evaluation of materials proposed for dredging was conducted as part of the ESA re-consultation and can be found in Appendix B of the Biological Assessment and in the Biological Assessment amendment letter (both found at Exhibit H of the Supplemental IFR/EIS). The additional evaluation confirmed the earlier conclusion that the primarily sandy dredged material does not contain unacceptable concentrations of contaminants and is suitable for unconfined in-water disposal. No additional testing is necessary.

The cumulative impacts of other ongoing and currently authorized activities involving discharges of dredged or fill material that potentially affect contaminants are reflected in the current conditions described in the Final and Supplemental IFR/EIS. Future activities, including potential future upland development, are not anticipated to affect contaminants except in the immediate vicinity of such projects. While future cleanup of the Willamette River under the federal superfund program could potentially affect contaminants in a limited downstream area, the cleanup plan has not been developed yet and therefore the potential effect of the cleanup can not be predicted at this time. Further, because the purpose of the cleanup is to effectively control contaminants and protect human health and the environment, it is likely that a major focus of cleanup design will be on avoiding and eliminating any off-site contaminant impacts.

Aquatic Ecosystem and Organism Determinations

Impacts to the aquatic ecosystem associated with discharge of dredged material will occur. Impacts associated with flowlane discharge of dredged material are expected to be minimal since the substrate of the main navigation channel consists primarily of sand naturally formed into sand waves by river currents. These sand waves are constantly eroding and reforming and do not provide the stable habitat needed for productive benthic communities. Sampling in the channel areas has confirmed their low productivity for benthic invertebrates. Additionally, those portions of the sand waves in the dredging prism are disturbed by annual dredging operations that typically occur from May through September for the navigation channel.

In-water disposal operations consist of flowlane disposal, use of two sumps and three shoreline disposal sites. Flowlane disposal is done in or adjacent to the channel margins typically at depths from 50-65 feet. These areas are generally similar to the channel areas and are not considered very productive for benthic communities. Static benthic communities would be covered and would not likely recover because of the continuous use of the sites. However, populations of these organisms are not considered to be very high because of the dynamic nature of the flowlane habitat.

Mobile organisms present in flowlane disposal areas, such as smelt, sturgeon and crab, are adapted to the dynamic nature of the habitat arising from continuous movement of sand via river currents. They are mobile organisms and generally should be physically capable of avoiding the disposal in most instances. Sturgeon occur in the flow lane disposal sites as both adults and juveniles. The behavioral research by the USGS, funded by the Corps, will be used to manage the dredging and disposal operations to minimize impacts to sturgeon populations. Dungeness crabs are located primarily in the lower reaches of the estuary but can occur as far upriver as mile 15 when river flow is low and up river salinity is high. Crabs could be present in Harrington Sump as well as the flowlane site at RM 5. Studies have shown that crab are able to dig out of disposal materials, although some individual crab do not dig out and are smothered. The number of crabs impacted will depend upon how many are in the disposal site, which is dependent upon river and tide conditions. A study to develop a model of crab abundance versus salinity is being developed by Battelle NW Labs for the Portland District. This model will be used to schedule dredging and disposal to avoid periods of high crab abundance to the extent practicable in order to minimize impacts.

Studies have shown that smelt spawning is not successful in the high-energy areas like those used for flowlane disposal. Larval smelt move up into the water column after hatching; consequently, it is likely that smelt larvae would not be affected by aquatic disposal operations. Based on the above, it is likely that smelt populations would not be affected by flowlane disposal.

Shoreline disposal sites are located in areas that are highly erosive and do not provide much, if any, habitat for benthic communities. Consequently, use of these sites is not expected to have a significant impact on the benthic productivity of the area. Through consultation with the NMFS, only three shoreline disposal sites (Sand Island and Miller Sands Spit, Oregon and Skamokawa, Washington) are cleared for disposal operations.

Proposed wildlife mitigation actions would restore wetland functions of high value on approximately 210 acres over the three wildlife mitigation areas. Wetland habitat development would occur in the context of a larger, diverse, natural area, with a substantial riparian forest component, at each mitigation site. Riparian habitat restoration would restore approximately 228 acres of this habitat feature compared to the approximately 50 acres impacted by disposal. Fill activities associated with the Martin Island embayment mitigation site will convert the aquatic ecosystem at the site to intertidal emergent marsh.

Proposed ecosystem restoration features at Lois Island embayment and Miller/Pillar would restore approximately 590 acres of low to moderately productive subtidal habitat to highly productive shallow subtidal and tidal marsh habitat. Tidegate improvements at Burris Creek and inlet structures (interim action) at Tenasillahe Island would improve water quality and salmon habitat in several sloughs within the island complex. Implementation of the long-term feature at Tenasillahe Island, breaching the flood control dikes, would restore approximately 1,778 acres of habitat to tidal influence in the future. The Shillapoo restoration feature creates waterfowl and wildlife habitat on 470 to 839 acres (dependent upon planned acquisition).

The USFWS and the NMFS have both determined that the proposed action, including ecosystem restoration features, is not likely to jeopardize the continued existence of threatened or endangered species under their purview. The NMFS believes that the most predictable impacts from the proposed action to ESA-listed salmonids and their habitats in the lower Columbia River, estuary, and river mouth are short-term, physical changes during the construction and subsequent maintenance period of the project. Expected impacts to key physical processes will be limited and short-term in nature during construction and maintenance. Further discussions of aquatic impacts are included in the Final IFR/EIS, Supplemental IFR/EIS and Biological Assessments prepared by Portland District for this action and in the biological opinions prepared by the USFWS and NMFS.

The cumulative impacts of other ongoing and currently authorized activities involving discharges of dredged or fill material that potentially affect the aquatic ecosystem and organisms are reflected in the current conditions described in the Final and Supplemental IFR/EIS. Future activities, including potential future upland development, are not anticipated to affect the aquatic ecosystem and organisms except in the immediate vicinity of such projects. Further, any such projects that may affect the aquatic ecosystem and organisms are likely to require independent evaluation under the Endangered Species Act and NEPA. While future cleanup of the Willamette River under the federal superfund program could potentially affect the aquatic ecosystem and organisms in a limited downstream area, the cleanup plan has not been developed yet and therefore the potential effect of the cleanup cannot be predicted at this time.

Proposed Disposal Site Determinations

In-water disposal, flowlane and sump disposal, may be conducted by either hopper or pipeline dredges. The aerial extent of the mixing zone for in-water disposal is influenced by river conditions, material type, and dredge equipment. These factors are discussed in detail in the BA, SEIS, and the FEIS.

Flowlane disposal sites are located in or adjacent to the Columbia River federal navigation channel from RM 3 to RM 106, at depths generally from 50 to 65 feet. However, there would be exceptions to the general depth criteria for the channel improvement project. The actual disposal sites cannot be designated beyond the general description in the first sentence of this section. They vary from year to year depending on the condition of the channel. Flowlane disposal could occur at depths of 35 to 65 feet between CRMs 64 and 68 and CRMs 90 and 101. Flowlane disposal could occur in areas over 65 feet deep in four specific areas: downstream of CRM 5; CRMs 29 to 40; CRMs 54 to 56.3 on the Oregon side of the channel; and CRMs 72.2 to 73.2 on the Washington side. The sump sites are located near RM's 18-20 and 20-22. River currents along the river are influenced by upstream discharges and ocean tides and typically vary from –1 fps to +3 fps. The Columbia River is generally not stratified except in the estuary where salinity intrusion causes stratification. The stratification is not expected to significantly influence mixing of the disposal plume.

The substrates at the flowlane and sump locations are predominately medium grain sand with some fine and coarse grain sand with less than 1 percent silt or clay. Columbia River suspended sediment concentrations vary seasonally, but are generally between 10-20 mg/l during the dredging season.

Hopper dredges discharge through doors in the bottom of the hull while under power and traveling at slow speeds, generally around 1 or 2 knots. Hopper dredges typically discharge their load in a 5-20 minute period. A hopper dredge may make 6-15 disposal cycles per day. Loaded draft depths for hopper vessels vary with their capacity but will typically fall in the 15-30 foot depth range which is essentially the range for load discharge. The hopper dredges generates a turbidity plume that is limited in extent to the area below the discharge depth and immediately along the vessel path for the 5-20 minute disposal effort. The discharged sand settles quickly to the river bottom. The sediment concentrations in the plume are limited because of the small amount of fines in the disposal material. River currents will carry the plume a short distance before it mixes with the river.

For pipeline dredges, dredged material is continuously pumped through a discharge diffuser that is located 20 feet below the water surface. The discharged sand settles rapidly to the bottom and a plume of fine grained sediments is carried away by the river currents. The downstream extent of the plume will depend on the river velocities and channel geometry at each discharge site.

For flowlane and sump disposal the river current would carry away fine sediment but since the disposal material would be mostly sand, the extent and duration of the plume would be minor. No mud flats and vegetated shallows would be affected by disposal in these areas as it occurs in and adjacent to the navigation channel which is generally distant from these habitat types The material would not introduce toxic substances (see above discussion of contaminant determinations) into the surrounding waters.

Shoreline disposal can generate elevated suspended sediment concentrations near the shoreline at the three shoreline disposal sites. The suspended sediment concentrations decrease rapidly as the disposal water mixes with the river discharges.

The Lois Island and Miller-Pillar restoration sites will be filled by pipeline dredge. The disposal operation will be similar to a shoreline disposal. The suspended sediment plume will also be similar to that caused by shoreline disposal. The currents at the Lois Island site are generally lower than those in the main river channel and the plume will move away more slowly than at the shoreline disposal sites. The Miller-Pillar site will have reduced current velocities within the pile dike field, but the plume will rapidly mix with the river currents outside of the dike field.

The Martin Island mitigation site will be filled by pipeline dredge. The disposal operation will be similar to a shoreline disposal. The suspended sediment plume will also be similar to that caused by shoreline disposal. The currents at the Martin Island site are generally lower than those in the main river channel and the plume will move away more slowly than at the shoreline disposal sites.

Potential Effects on Human Use Characteristics.

Municipal and Private Water Supplies: There are no municipal or private water supply intakes in the vicinity of the disposal areas.

Recreational and Commercial Fisheries: Impacts to recreational and commercial fisheries will occur. Fill at Lois Island embayment will restrict the area available for recreational fishermen, principally for sturgeon, and commercial fisherman who utilize this area as part of the Select Area Fishery established in the lower Columbia River. The Miller/Pillar location would impact a portion of the Miller Sands gill net drift rendering it unsuitable for commercial fishing use. As indicated by the evaluation of contaminates above, the commercial and recreational fisheries are not anticipated to be impacted by contaminants. Disposal operations are not expected to disrupt migration and spawning areas. Dredging impacts to crab, including flowlane discharge of dredged material, are anticipated to impact a small fraction of the crab population in the estuary. The crab population in the estuary is only part of the total crab population in the area. Therefore, the project is not anticipated to adversely affect the crab fishery.

Water-related recreation: Water related recreation in the project area consist of: pleasure craft, jet skies, water skiing, wind surfing, canoeing, and kayaking . Impact to water related recreation is expected to be minor in areas where disposal will occur. Dredges will be operating in localized areas within the project area for short periods of time. Although there may be some disturbances to individual recreators, these disturbances will be minimal. Disposal within the Martin Island embayment to create emergent marsh habitat will prevent the recreational boaters' use of that area.

Aesthetics: No impacts to aesthetics are anticipated.

Parks, etc: There are two public beaches that are also shoreline disposal locations. While material is being disposed of at this location, there will be minor disturbances to shoreline use by individuals using the beach. The periodic placement of material at these locations enables continued public use of these areas. There are no national and historical monuments, national seashores, wilderness areas, and research sites within the discharge areas.

Determination of Cumulative Effects on the Aquatic Ecosystem

The proposed discharge of dredged material is not expected to have any significant adverse cumulative effects on the aquatic ecosystem.

The wetlands proposed for dredged material disposal do not contribute much value to the aquatic ecosystem in their current state as they lie behind flood control dikes, are subject to drainage, and are impacted by current agricultural activities. Proposed enhancement and development of wetlands through implementation of the wildlife mitigation plan, and

shallow water, riparian, slough and tidal marsh habitat improvements through restoration, would add cumulative resource value to the lower Columbia River ecosystem.

Other discharges of dredged material associated with the project are not predicted to have significant adverse effects either alone or in combination with other existing or reasonably predicted discharges of dredged or fill material. As discussed above, the cumulative effects of other ongoing and currently authorized activities involving discharges of dredged or fill material (e.g., existing filling and diking, ongoing maintenance dredging, maintenance of the mouth of the Columbia River, operation of the Federal Columbia River power system, and existing development along the Columbia River) are reflected in the current conditions described in the Final and Supplemental IFR/EIS.

While not caused by or connected to channel improvement, some future development of port, marine, and industrial facilities is reasonably foreseeable within the project area. Similarly, continued urban and industrial development in the project area is reasonably foreseeable in response to regional and national economic trends.

Future urban, industrial and port development as it is implemented, would likely include some discharge of dredged or fill material which would in turn result in localized impacts to aquatic ecosystems (e.g., wetlands, riparian and shallow water habitat, and water quality). The NMFS and USFWS May 2002 Biological Opinions discuss such potential development and its potential impacts (e.g. increased localized demand for electricity, water and buildable land with indirect effects to water quality; and, the increased need for transportation, communication and other infrastructure;) on listed species, as well as state, local, tribal and private actions to benefit listed species.

Given the large geographic area involved and the uncertainties associated with state, local, tribal and private actions, the precise nature and timing of future development, and its environmental impact, are extremely difficult to predict. However, given the minimal adverse effects to aquatic ecosystems (if any) anticipated for the discharge of dredged materials associated with the entire Columbia River channel improvement project (including the ecosystem restoration features and mitigation measures), the discharges under the proposed project are not anticipated to contribute significantly to any adverse cumulative effects resulting from unrelated development projects. Further, all significant future development, including future discharge of dredged or fill material, will likely be subject to additional independent environmental reviews by state and federal agencies under the NEPA, CWA, ESA, and similar state programs.

Cleanup of the lower Willamette River under the federal Superfund program is also reasonably foreseeable and may directly affect the Columbia River and its aquatic ecosystem. At this time, the remedial investigation and feasibility study have not yet been completed and a cleanup plan has not been selected. Therefore, it is not possible at this time to determine the nature or magnitude of any short-term or long-term impacts of the cleanup action on the aquatic ecosystem or whether such impacts would be cumulative to any impacts (positive or negative) of the channel improvement project.

Determination of Secondary Effects on the Aquatic Ecosystem

The proposed action would not result in fluctuating river levels. Surface runoff from disposal sites would be negligible as precipitation is expected to readily percolate into the sand. The rehandling (sale) of sand from upland disposal and shoreline disposal sites would not affect the aquatic ecosystem as the activity would occur behind containment dikes and/or above the high tide line. No other secondary effects resulting from the discharge of dredge material are anticipated.

IV. Findings of Compliance (40 CFR § 230.12)

a. No significant adaptations of the guidelines were made regarding this evaluation.

b. Alternatives. Alternatives to the proposed action were considered, including the no-action alternative. Upland disposal of all Columbia River dredged material is not practicable from a physical or economic standpoint and would affect substantially more wetlands and wildlife habitat if it were implemented. All alternative disposal actions have been evaluated for engineering and environmental suitability using an array of screening criteria. Avoidance of wetlands, critical (ESA) riparian habitat and habitat important to threatened and endangered species are among the screening criteria considered in the analysis. Any remaining wetlands or riparian areas affected by disposal were considered unavoidable in achieving a practicable disposal plan. A wildlife mitigation plan addressing impacts to agricultural, wetland and riparian habitats has been developed in cooperation with federal and state resource agencies. Ecosystem restoration features were formulated as the result of a series of workshops with federal and state resource agencies and the public, and through the ESA reconsultation process between the Corps, NMFS and USFWS, and was based on review of potential alternative actions that would benefit listed ESA species, including salmonid ESUs and Columbian white-tailed deer, and also improve fish and wildlife habitat conditions generally.

c. Water Quality Standards [40 CFR § 230.10(b)(1)]. The project complies with state water quality standards. The Corps has applied to the States of Oregon and Washington for water quality certifications under Section 401 of the Clean Water Act for all discharges of dredged material into waters of the United States associated with the project. Issuance of these certifications will reflect the states' reasonable assurance of compliance with state water quality standards.

d. Toxic Effluent Standards [40 CFR § 230.10(b)(2)]. The USEPA has designed 65 substances and compounds as toxic pollutants under section 307 (see 40 CFR § 401.15), but it has adopted effluent standards under this subsection only for manufacturers and formulators of aldrin, dieldrin, DDT, DDD, DDE, endrin, toxaphene, benzidene, and polychlorinated biphenyls (PCBs; see 40 CFR part 129). The disposal of dredged material associated with this project would not violate toxic effluent standards of Section 307 of the CWA.

e. Endangered Species [40 CFR § 230.10(b)(3)]. The proposed action has been evaluated under the ESA through formal consultation with the USFWS and the NMFS. Biological Assessments prepared by the Corps for species under the jurisdiction of the USFWS principally concluded that the proposed action would have no affect on nine listed species and determined that certain actions may affect Columbian white-tailed deer, bald eagles and peregrine falcons. Subsequently, Aleutian Canada goose and peregrine falcon were delisted. Further, the Corps concluded that the project had a limited potential to adversely affect bull trout and coastal cutthroat trout (USFWS jurisdiction) and listed Columbia River salmonid ESUs (NMFS jurisdiction) and formal consultation was entered into with the USFWS and NMFS to address affects to these species. The Biological Opinion prepared by the NMFS concluded that the proposed action is not likely to jeopardize the continued existence of all listed Columbia River salmonid ESUs under their jurisdiction. NMFS also concluded that the project would not result in the destruction or adverse modification of then-designated critical habitat for salmonids.[1] The USFWS concluded that the proposed action is not likely to jeopardize the continued existence of bull trout, coastal cutthroat trout (subsequently not listed), bald eagles, or Columbian white-tailed deer. They concurred with the Corps' determination on the other listed species under their jurisdiction. The Corps will comply with numerous terms and conditions listed in the Biological Opinions prepared by the Services in order to implement the 'reasonable and prudent measures' identified. Corps actions will address dredging impact minimization measures, best management practices, monitoring activities, ecosystem restoration features, and ecosystem research actions.

f. Marine Sanctuaries [40 CFR § 230.10(b)(4)]. No marine sanctuary designated under Title III of the Marine Protection, Research, and Sanctuaries Act of 1972 will be affected by the proposed action.

g. No Significant Degradation [40 CFR § 230.10(c)].

As discussed in the Final and Supplemental IFR/EIS and in the factual determinations above:

(1) The proposed action, including wildlife mitigation actions and ecosystem restoration features, would not result in significant adverse effects on human health or welfare, including municipal water supplies, plankton, fish, shellfish, or wildlife.

(2) Significant adverse effects on life stages of aquatic life and other wildlife dependent on the aquatic ecosystem, on ecosystem diversity, productivity, or stability, or on recreational, esthetic, or economic values would not occur.

(3) No significant adverse effects on aquatic ecosystem diversity, productivity and stability are expected due to avoidance, impact minimization, mitigation of impacts, and implementation of best management practices, monitoring actions, and research actions to assess project-related impacts throughout the project life.

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[1] Although the Biological Assessment and Biological Opinion addressed potential effects on salmonid critical habitat, NMFS has since withdrawn the designation of such habitat.

(4) No significant adverse effects of the discharges are expected on recreational, aesthetic and economic values.

h. Minimization of Impacts [40 CFR § 230.10(d)]. Initial efforts focused on avoiding or minimizing impacts to the extent practicable during selection of disposal sites. Avoidance was accomplished by focusing disposal at existing and previously used disposal sites. Sites with wetland and riparian habitat were avoided to the extent practicable. The two wetland sites that will be filled are of low quality, function and value. Adjustment of disposal site boundaries to avoid riparian and wetland habitat where possible, based on site visits and aerial photography, has also continued throughout the process. Additional appropriate steps to minimize potential adverse impacts, in accordance with the BMP's that resulted from the ESA consultaion, would be specified in the dredging contracts for new construction efforts and/or dredging orders for O&M dredging actions. With the inclusion of appropriate and practical conditions to minimize pollution or adverse effects to the aquatic ecosystem, the proposed discharge is specified as complying with the requirements of Section 404(b)(1) guidelines.

V. Conclusions

The factual determinations and findings in this evaluation summarize and incorporate information on and analysis of related issues contained in the Final and Supplemental IFR/EIS.

On the basis of the factual determinations and findings made above, I conclude that the proposed disposal sites for discharge of dredged materials as outlined in the *Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement* and the *Supplemental Integrated Feasibility Report and Environmental Impact Statement* comply with the Guidelines at 40 CFR Part 230 and with the requirements of Executive Order 11,990 (Protection of Wetlands).

I further conclude, based on the factual determinations and findings made above, in combination with the Final and Supplemental IFR/EIS' analysis of other potential environmental impacts of the project as well as the projected contribution to National Economic Development, that the proposed discharge of dredged material associated with the project is in the overall public interest.

Date: _____

Richard W. Hobernicht
Colonel, EN
Commanding