SECTION 404(b)(1) EVALUATION
COLUMBIA RIVER NAVIGATION CHANNEL IMPROVEMENT STUDY
COLUMBIA AND LOWER WILLAMETTE RIVERS NAVIGATION PROJECT
OREGON AND WASHINGTON

I. Introduction

Section 404 of the Clean Water Act of 1977 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. This evaluation assesses the effects of the discharge described below utilizing guidelines established by the U.S. Environmental Protection Agency (USEPA) under the authority of Section 404(b)(1) of the Act.

II. Description of Proposed Action

Proposed Action

The proposed action is to deepen the Columbia and Lower Willamette River Federal Navigation Channel from its currently authorized 40-foot depth to a maximum depth of 43 feet based on the recommendations in the Final *Integrated Feasibility Report for Channel Improvements and Environmental Impact Statement*, dated August 1999 (Final IFR/EIS). The actions to be specifically addressed under the guidelines are:

(1) Potential wetland fills at two sites totaling 15.2 acres. Both sites are located in Washington; 9.8 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 at depths generally ranging from 45 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) In-water placement of dredged material for restoration of shallow water habitat at Lois Island embayment and between Pillar Rock Island and Miller Sands.

(4) Restoration of aquatic circulation and riparian habitat in Bachelor Slough, Ridgefield National Wildlife Refuge, Washington.

(5) Restoration of aquatic circulation in Tenasillahe Island sloughs, Julia Butler Hansen National Wildlife Refuge, Oregon, which would include construction of two temporary cofferdams to allow installation of inlet structures in a “dry” environment.

Purpose and Need

The purpose and need for the project has been defined by Congress to improve the deep-draft transport of goods on the authorized Columbia and lower Willamette River navigation channel (limited to a maximum depth of 43 feet) and to provide ecosystem restoration for fish and wildlife habitats. The purpose and need are described more fully in Section 1.1 of the Supplemental IFR/EIS. For purposes of 404(b)(1) analysis, deepening of the authorized navigation channel is water dependent. The channel is adjacent to and in the proximity of special aquatic sites and while impacts to those sites have been minimized, they cannot be avoided completely due to the operational limitations of hopper, pipeline and clamshell dredges. Upland disposal sites must be adjacent to the river in order to move the materials directly to the disposal site. This requires upland sites all along the navigation channel.

The proposed in-water restoration at Lois Island embayment, between Miller Sands and Pillar Rock Island, and Bachelor Slough are the result of formal consultations with the National Marine Fisheries Service (NMFS) and U.S. Fish and Wildlife Service (USFWS) under the Endangered Species Act. The Tenasillahe Island and Bachelor Slough restoration features are recommended by USFWS. Their purpose is to restore habitat to improve conditions for the survival of listed salmon stocks as well as to improve wildlife habitat.

General Description of Dredged or Fill Material

Current maintenance of the Columbia and Lower Willamette Rivers navigation channel requires dredging an average quantity of 5.5 mcy of sediments annually. About 4 mcy of this amount are dredged with a pipeline or hopper dredge and disposed in flowlane locations in or adjacent to the navigation channel. All of the material dredged from the Columbia River is coarse to medium-grained sand. All sediments evaluated under the current channel maintenance program have been determined to be suitable for unconfined in-water disposal. Dredged material disposed in-water (flowlane) would be reduced from an estimated 46 to 21 mcy over the next 20 years for the 43-foot deepening alternative. Estimated quantities proposed for wetland fills range from 0.5 to 1.0 mcy.

As described in Section 5.1.7 of the Supplemental 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 to the Final IFR/FEIS (August 1999). All material dredged will be tested and assessed under joint USEPA and Corps dredged material evaluation guidelines prior to flowlane or upland disposal. The likelihood of contamination by contaminants is low in the federal navigation channel based upon all of the past testing and evaluation discussed in the EIS. 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. Sediments proposed for dredging to improve aquatic circulation in Bachelor Slough are primarily silt and fine-grained sand. About 130,000 cubic yards of sediments would be dredged and will require further chemical analysis to determine their suitability for unconfined in-water disposal.

Description of the Proposed Discharge Sites

Flowlane sites are in or adjacent to the Columbia River at depths generally from 45 to 65 feet. However, there would be exceptions to the general depth criteria for the proposed channel deepening. The actual disposal sites cannot be designated. 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 five 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 coarse to medium-grained sand.

The wetland sites total a maximum of 15.2 acres. Both sites are located in Washington [9.8 acres at Mt. Solo (W-62.0) and 5.4 acres at Puget Island (W-44.0]. For the past several (up to 30) years, these sites have been drained and used for a variety of agricultural purposes. The Lois Island embayment site totals about 389 acres. The existing substrate averages about 18 feet CRD and consists of fine-grained sand and silt. The area between Pillar Rock and Miller Sands Islands is about 162 acres. The existing substrate averages about 25 feet CRD and consists of medium to coarse-grained sand. The Bachelor Slough aquatic area totals about 85 acres. Discharge within the slough would be minor and incidental for the primarily dredging action. The existing substrate consists of silts and fine-grained sand. The Tenasillahe Island sites affected by temporary cofferdam construction are fine sand substrates at 2 to 4 foot depths.

III. Alternatives

The Final IFR/EIS describes the alternatives to the proposed project in detail. In addition to alternatives to the overall project, specific alternatives were evaluated for flowlane disposal areas and upland disposal sites. As discussed in the Final IFR/EIS, none of the alternatives to the proposed action adequately meet the purpose and need defined by Congress. As required by the 404(b)(1) Guidelines, a detailed evaluation of upland and flowlane disposal alternatives was performed in conjunction with preparation of the Final IFR/EIS. All practicable alternatives to the disposal sites proposed to be used were studied. As discussed in the Final IFR/EIS and below, practicable alternatives to the proposed flowlane disposal areas and the two affected wetland sites do not exist.

The Supplemental IFR/EIS describes the proposed restoration at Lois Island embayment and Pillar Rock-Miller Sands, and Tenasillahe Island and Bachelor Slough aquatic restoration. The restoration features were developed through the ESA consultation process with NMFS for listed salmon species and USFWS for fish and wildlife habitat restoration.

a. <u>In-water (Flowlane) Disposal</u>

In-water disposal avoids impacts to special aquatic sites, like shoreline areas, mudflats, wetlands and vegetated shallows. As proposed, in-water disposal will not affect any special aquatic sites since disposal will occur primarily at depths of 35 to 65 feet and no shallow water areas will be affected. The areas used for in-water disposal inherently change yearly depending on natural changes in the river that necessitate dredging. As noted in the Final IFR/EIS, the greatest use of in-water disposal will be in areas where there are few upland

disposal site options. The alternatives evaluated focused not on specific alternative in-water disposal sites, but rather on ways to avoid special aquatic site impacts and to minimize the amount of dredging that will be required in the future. By minimizing the amount of dredging required, the in-water disposal impacts are reduced.

b. Upland Disposal Sites

The process used for screening upland disposal sites is described in detail in Section 4.4.3.4 of the Final IFR/EIS. Over 157 sites were reviewed. Environmental and engineering criteria were applied to screen the sites. One of the criteria applied was avoidance of wetlands to the extent practicable. As a result of the screening and comments on the draft EIS, the total area of wetland fill has been reduced from 38 acres in the least cost plan evaluated in the draft EIS to only 15.2 acres in the recommended plan. The two remaining areas of wetland fill, 9.8 acres at Mt. Solo and 5.4 acres at Puget Island, are in river areas where no other practicable means exists for disposing of dredged material. Other upland or in-water sites are not available in the vicinity. The project sponsors will acquire the two wetland fill sites, along with other upland disposal sites. Following site acquisition and before any filling occurs, the wetlands on the sites will be delineated. The sponsors will obtain any required permits before any wetland fill occurs at either site. The two sites requiring some wetland fill currently serve no useful wetland functions such as wildlife habitat or flood storage. The sites have been drained and used for agricultural purposes for the past several years.

c. Restoration Sites

Selection of the proposed restoration sites was based on review of potential actions that would benefit listed salmon species and improve aquatic habitat conditions in general. The proposed locations were determined to be among the few aquatic sites, which would achieve this purpose. Further discussion of site selection criteria are included in the Supplemental IFR/EIS and 2001 Biological Assessment prepared for ESA-listed salmon.

IV. Factual Determinations (40 CFR § 230.11)

Physical Substrate Determinations

The substrate of all flowlane disposal sites is primarily sand. The disposal of dredged material would alter the depth and/or gradient of the sites slightly raising the bottom elevation. 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 wetland sites is primarily silty clay loam. Placement of dredged material at the sites would change the physical composition to primarily sand. The substrate of the restoration sites ranges from coarse sand to silt. Placement of dredged material in these sites would raise bottom elevations from 18 to 30 feet with medium to coarse-grained sand. Bottom elevations at Bachelor Slough would increase about 1-foot in depth. Bottom sediments would remain essentially the same type as prior to dredging.

Water Circulation, Fluctuation and Salinity Determinations

The disposal would affect minor changes in hydrologic features such as circulation patterns, downstream flows, or normal water level fluctuations. Water quality characteristics such as salinity, water chemistry, clarity, color, odor, taste, dissolved gas levels, temperature, or nutrients would not be affected to any measurable degree. As discussed in Sections 6.2.3.2 and 6.2.3.3 of the Final and Supplemental IFR/EIS and Appendix F of the Final IFR/EIS, channel deepening and related disposal could cause a minor concentration of flow in the main channel. 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 is included in the Supplemental IFR/EIS. The proposed restoration actions at Tenasillahe Island and Bachelor Slough are intended to improve water circulation within the sloughs.

Suspended Particulate/Turbidity Determination

Short-term minor increase in turbidity would occur in the immediate disposal vicinity of in-water sites. This condition would temporarily inhibit light penetration through the water column and thereby affect aquatic organisms. Since the dredged material is primarily sand, the expected short-term increase in turbidity levels would not violate state water quality standards. Best management practices would be utilized for the Tenasillahe Island and Bachelor Slough dredge and fill actions, including construction of temporary cofferdams to contain and allow settling time for suspended sediments. See further discussion in Chapters 4 and 6 of the Final and Supplemental IFR/EIS.

Contaminant Determinations

The primarily sandy dredged material would not contain unacceptable quantities, concentrations, or forms of contaminants deemed critical to the proposed placement sites. Sediments in the Columbia River are classified as clean river sand with sieve analysis gradients of fine to coarse sand. This material has been determined to be acceptable for unconfined in-water disposal by the USEPA and the States of Oregon and Washington. Sediments in the mainstem Columbia River typically are composed of sand with less than one to five percent in the silt to clay size classification and less than one percent volatile solids. The two dominant shoal forms are large sand waves and cutline shoals. Sand waves are present throughout the river channel and cause shoals across the channel. Cutline shoals are much larger and run parallel to the channel and develop at the same location year after year. The material present in the mainstem Columbia River meets exclusionary criteria as defined under the Marine Protection, Research, and Sanctuaries Act (MPRSA) and the Clean Water Act (CWA) and, therefore, would not be subject to further testing. Further

sediment testing would be required for sediments dredged for the Bachelor Slough aquatic restoration action.

In June 1997, surface grab samples were collected from the Columbia channel and surface and core samples were collected from the Willamette channel. Eighty-nine stations were sampled from the Columbia channel (CRMs 3.0 to 106.2) for physical analysis, and 23 were further analyzed for chemical contaminants. Sixty-eight samples were analyzed from 43 stations in the Willamette River (river miles 0.1 to 11.5) for physical analysis, and 45 (including replicate samples) were further analyzed for chemical contaminants.

The following chemical tests were performed: nine inorganic total metals, 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. A summary of the physical and chemical test results for Columbia River sediment is presented below. Additional 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*.

Physical analysis, total organic carbon, and total volatile solids. Approximately 95% of the material recovered was classified as poorly graded sand with a mean grain size of 0.56 mm and an average TVS of 0.62%. Of the 90 samples submitted for physical analysis, only 4 (CRMs 12.4, 83.3, 99.2, 100.2) exceeded 20% fines and had greater than 5% TVS.

Metals. Twenty-three sediment samples were analyzed for 9 metals: arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc. Of the samples tested, three samples (CRMs 12.4, 83.3, 100.2) showed the highest levels of metals. However, all three samples were well below the established screening levels.

Pesticides and polychlorobiphenyls. Pesticides were found in 4 of the 23 samples tested (CRMs 12.4, 83.3, 99.2, 100.2). The laboratory considered these values as estimate concentrations because the value was less than the method reporting limit, but greater than the method detection limit. PCBs were found only in one sample (CRM 100.2). None of the pesticide or PCB levels exceeded established screening levels.

Polynuclear aromatic hydrocarbons. Low levels of PAHs were found in most of the 23 samples submitted for chemical analysis. Three samples (CRMs 12.4, 83.3, 100.2) showed the largest individual amounts of both high and low density PAHs detected. All levels detected, as well as totals of low and high density PAHs, were well below the established screening levels, however.

P450 reporter gene system. P450 is the designation for a group of enzymes that play a key role in activating or deactivating many toxic chemicals including PAHs, PCBs, dioxins and furans. The sample at CRM 11.0 contained low levels of PAHs above background; CRM 12.4 contained somewhat higher levels of PAHs and low levels of chlorinated hydrocarbons. The sample at CRM 83.3 contained the highest PAH level and significant

amounts of chlorinated hydrocarbons (PCBs or dioxins/furans). Because PCBs were not detected, it is likely that the chlorinated hydrocarbons detected were dioxins or furans.

Aquatic Ecosystem and Organism Determinations

Flowlane disposal would continue to occur within the areas previously impacted. The organisms that have adapted to the ongoing maintenance practices would continue to be affected to the same degree. The two wetland sites have been significantly degraded by farming practices for the past 30 years.

Vegetation at the sites consists primarily of pasture grasses with scattered remnants of sedge. These wetland sites have been drained, cut off from their original river connections and/or intensively utilized for crop or pasture production. Filling these two wetland sites will have no effect on flow and circulation patterns because they have been cutoff and converted. Proposed mitigation would restore wetland functions of high value over a much larger (13.5 times) area. Riparian habitat restoration would restore over 200 acres compared to the approximately 50 acres impacted by disposal. Proposed restoration actions at Lois Island embayment and Pillar Rock-Miller Sands would restore approximately 550 acres of low to moderately productive subtidal habitat to highly productive shallow subtidal and tidal marsh habitat. Restoration of Bachelor Slough would improve over 90 acres of aquatic circulation and riparian habitat. Tidegate improvements and inlet structures at Tenasillahe Island would improve water quality and salmon habitat in several sloughs within the island complex. No threatened or endangered species would likely be placed in jeopardy by the proposed action. Dredging and disposal actions would be scheduled so that salmon migrations would not be disrupted. Further discussions of aquatic impacts are included in the Final IFR/EIS, Supplemental IFR/EIS and Biological Assessments prepared for this action.

Proposed Disposal Site Determinations

The mixing zone would be limited to the smallest practicable area. For flowlane disposal, the river current would carry sediment downstream but since the material would be mostly sand, the extent and duration of mixing would be minor. No mud flats and vegetated shallows would be affected by flowlane disposal. The placement of the sandy material would be in compliance with USEPA and state water quality standards. The material would not introduce toxic substances into surrounding water or violate the primary drinking water standard of the Safe Drinking Water Act (42 USC 300 et seq.). See above discussion of contaminant determinations. There are no municipal or private water supply intakes in the vicinity of the flowlane disposal areas. Impacts to recreational and commercial fisheries will occur. These impacts are addressed in Section 6.8.1 and 6.8.6 of the Final and Supplemental IFR/EIS. Disposal sites have been selected in order to minimize mounding and shoaling in order to reduce impacts to the fisheries. The overall amount of flowlane disposal will actually be reduced, compared to historic practices. Habitat impacts are addressed in the Final and Supplemental IFR/EIS and the Biological Assessments. Impacts to aesthetics are described in Section 6.8.5 of the Final and Supplemental IFR/EIS. The proposed action reduces shoreline disposal sites and increases the use of upland sites, thus reducing aesthetic impacts to aquatic sites.

Determination of Cumulative Effects on the Aquatic Ecosystem

The proposed action 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. Proposed creation of new wetlands through mitigation, and new shallow water, riparian, slough and tidal marsh habitat through restoration, would add cumulative resource value to the lower Columbia River ecosystem.

Determination of Secondary Effects on the Aquatic Ecosystem

The proposed action would maintain commercial navigation on the Columbia River resulting in continuing impacts to the aquatic ecosystem.

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 feasible from a physical or economic standpoint and would affect more wetlands if it were. All alternative disposal actions have been evaluated for engineering and environmental suitability using an array of screening criteria. Avoidance of wetlands, significant 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. Alternatives that may further reduce wetland fills will continue to be evaluated in conjunction with permitting the two remaining upland disposal sites that impact wetlands. A mitigation plan for agricultural, wetland and riparian habitat loss has been developed in cooperation with Federal and State resource agencies.

c. Water Quality Standards [40 CFR § 230.10(b)(1)]. The proposed action complies with applicable state water quality standards. Sediment has been collected and tested for physical and chemical properties from the mainstem Columbia and Willamette Rivers for this study (see Appendix B, *Columbia and Willamette River Sediment Quality Evaluation*). The Corps and the USEPA share the regulatory responsibility for the testing, evaluation and disposal of dredged material under the CWA and the MPRSA. All material dredged by the Corps or under Corps' regulatory permits would be evaluated under CWA or MPRSA guidelines. Except under specific circumstances, testing and assessment of dredged material as a hazardous waste pursuant to the Resource Conservation and Recovery Act is not considered technically appropriate. Under 40 CFR §261.4(g), dredged material from Corps civil works projects is not considered a hazardous waste. National policy reflects consistency with international agreements for the evaluation and management of dredged material, per the London Convention, as amended in 1998.

The guidelines and specifications for dredged material evaluations and disposal site management were developed jointly by the USEPA and the Corps. The evaluation guidelines have evolved over the past 20 years to reflect the results of long-term environmental effects of dredging research and the improvements in the technology. Both the MPRSA Testing Manual (the 'Green Book' 1991) and the CWA Inland Testing Manual (ITM 1995) adopt a tiered approach to the testing and management of dredged material. Regional manuals or framework documents are being developed to implement the national approach. The tiered testing framework allows for consistent design of project specific testing programs and the subsequent evaluation of test results meet statutory compliance for dredging and disposal of clean and contaminated sediments. These guidance documents establish the Regional Management Team, which is expected to result in more efficient completion of required evaluations, reduced costs, and data availability to the Corps and resource agencies.

Corps' projects containing fine-grained sediments dredged on a regular schedule are tested regularly (approximately every 5 to 10 years). The testing must provide current sediment quality information to allow dredging to proceed. New projects, projects dredged less often or sediments that meet exclusionary criteria are sampled and tested as needed. See above discussion of contaminant determinations.

d. Toxic Effluent Standards [40 CFR § 230.10(b)(2)]. The disposal of dredged material would not violate toxic effluent standards of Section 307 of the Clean Water Act. 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. Although sediment sampling discussed in the environmental impact statement for the project found aldrin, DDT, DDE, DDD, and PCBs, which could be released into the water column by dredging and disposal, USEPA's toxic pollutant effluence standards do not apply to such activities. None of the pesticide or PCB levels exceeded established screening levels.

e. Endangered Species [40 CFR § 230.10(b)(3)]. The proposed action has been evaluated under the Endangered Species Act through formal consultation with the USFWS and the NMFS. Biological Assessments prepared by the Corps conclude that the proposed action may affect listed species or critical habitat. The Biological Opinions prepared by the USFWS and the NMFS conclude that the proposed action would not likely adversely affect listed species.

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)].

(1) As discussed in the Final and Supplemental IFR/EIS, the proposed action, including mitigation and restoration, 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 restoration and avoidance and mitigation of impacts.

(4) No significant adverse effects of the discharges are expected on recreational, aesthetic and economic values, again due to avoidance and mitigation of impacts.

h. Minimization of Impacts [40 CFR § 230.10(d)]. Appropriate steps to minimize potential adverse impacts would be specified in the dredging contracts and/or dredging orders. 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.

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 *Supplemental Integrated Feasibility Report and Environmental Impact Statement* comply with the Guidelines at 40 CFR Part 230.

Date: _____

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Commanding