SUPPLEMENT

To the

REVISED CLEAN WATER ACT SECTION 404(b) (1) EVALUATION

For

MAJOR REHABILITATION OF THE JETTY SYSTEM AT THE MOUTH OF THE COLUMBIA RIVER IN PACIFIC COUNTY, WASHINGTON AND CLATSOP COUNTY, OREGON

I. Introduction and Project Description

This document incorporates by reference and supplements the *Revised Clean Water Act Section 404(b) (1) Evaluation for Major Rehabilitation of the Jetty System at the Mouth of the Columbia River in Pacific County, Washington, and Clatsop County, Oregon* – hereafter referred to as 404 (b) (1) Evaluation, (U.S. Army Corps of Engineers, Portland District (Corps), June 19, 2012). This supplement to the 404 (b) (1) Evaluation – hereafter referred to as Supplement – addresses updates to the preferred alternative/proposed action described in the both the draft *Supplemental Environmental Assessment* (SEA) and the *Revised Final Environmental Assessment for Columbia River at the Mouth, Oregon and Washington, Rehabilitation of the Jetty System at the Mouth of the Columbia River* (EA), (Corps, April 2013, and July 2012, respectively). Contingent on receipt of final clearance documents, the Corps issued a Finding of No Significant Impact (FONSI) on July 26, 2012 for the entire suite of actions, and a draft FONSI for actions specifically related to the South Jetty foredune augmentation on April 19, 2013.

The EA (incorporated by reference herein) and 404 (b) (1) Evaluation disclosed environmental impacts and provided a comprehensive analysis for all repairs and rehabilitation actions proposed for the jetty system at the Mouth of the Columbia River (MCR), including the following: (1) lagoon fill and critical repairs at the North Jetty; (2) scheduled repair and stabilization of the jetty length at the North Jetty; (3) scheduled repairs and stabilization of the jetty length at Jetty A; (4) interim repairs and intense monitoring at the South Jetty; and (5) foredune augmentation at the Clatsop Spit (Spit) adjacent to the South Jetty root. The Corps also proposed the formation of an Adaptive Management Team (AMT) comprised of the state and federal resource management agencies, along with compensatory mitigation for actions related to work on each of the jetties.

The draft SEA (incorporated by reference herein) clarified work of the preferred alternative as it relates to the foredune augmentation at Clatsop Spit adjacent to the South Jetty root. Since the EA and FONSI, further design was done related to the foredune. The draft SEA and this Supplement clarify the particulars of that work and further describe impacts to wetlands and waters of the U.S. that were not entirely covered in the EA or 404 (b) (1) Evaluation before the design evolved.

Since completion of the EA, the Corps' proposed design to augment the existing foredune adjacent to the South Jetty has evolved to reflect the following updates: (1) additional design options and material sources were considered as part of a value engineering (VE) study; (2) the locations of the proposed associated construction access and staging areas were altered to avoid cultural resource, shore pine forest, and additional dune impacts, but would have unanticipated minor wetland impacts; (3) an adjustment in the project design elevation would result in previously unforeseen fill in 404 waters of the U.S.; and (4) newly proposed compensatory mitigation would offset effects of fill in wetlands and waters of the U.S.

The preferred alternative is a cobble berm, dynamic revetment feature, which was described as cobble fill in the EA. The VE study explored design options in more detail, and findings reinforced the decision to select the preferred alternative. The location of the construction staging and access areas in the EA were immediately north of the jetty root. The staging areas proposed in the draft SEA and analyzed in this Supplement are now south of the jetty root along an existing roadway. The cobble fill design in the EA did not extend below the Clean Water Act (CWA) Section 404 jurisdictional Ordinary High Water (OHW) elevation. Whereas, in the draft SEA and this Supplement the proposed design does extend below OHW into Waters of the U.S. The EA did not anticipate fill effects in wetlands for a staging and access area south of the jetty root, nor did it account for fill effects as a result of the cobble placement. Therefore, additional compensatory mitigation has been proposed for unavoidable fill impacts.

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 dredge and fill materials associated with the major repair and rehabilitation activities at the Mouth of the Columbia River (MCR) jetty system are activities undertaken by or at the direction of the Corps of Engineers. Federal regulations at 33 Code of Federal Regulations (CFR) 336.1 provide that a Section 404 permit will not be issued for such fill material by the Corps to itself; however, the Corps shall apply the Section 404(b) (1) guidelines to the project. This Supplement assesses the effects of removal and fill actions described below 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. Guidelines for conducting a 404 (b) (1) Evaluation are described at 40 CFR 230.1-12.

The following discussion only covers and supplements discussions pertaining to the updates for the foredune augmentation actions, and is not a complete description of water quality impacts, which the 404 (b) (1) Evaluation contains. Only affected sections of the 404 (b) (1) Evaluation have been updated and included.

II. Description of Proposed Action

a. Location

The South Jetty is located in Clatsop County, Oregon near the cities of Warrenton/Hammond and Astoria. The foredune augmentation is immediately adjacent to the South Jetty root at the neck of Clatsop Spit in Fort Stevens State Park.

b. Project Description

This section only includes updated, excerpted details for the foredune augmentation feature. It does not include a full description of the entire preferred alternative; further details can be found in the EA and SEA.

The EA described the dune augmentation at the root of the South Jetty as cobble fill and as cobble berm foredune augmentation. The cobble berm is part of what forms the dynamic revetment, and for the purposes of this Supplement, all of these terms are synonymous. As indicated in the EA, draft SEA, and draft FONSI, the Corps proposes to construct a cobble berm/ dynamic revetment as foredune augmentation and has further refined its design composition.

Construction is proposed to occur in late summer to early fall 2013. Work would be sequenced to account for tide action. It is anticipated that construction would be completed before onset of the fall-winter storm season (October-November), when wave-surge action may affect construction operations. Construction would take up to 4 months and likely would occur between June and October 31.

The dune augmentation feature would key-into the existing foredune and would be comprised of a gravel bedding layer, a core of angular or rounded cobble, and a 4-ft deep rounded cobble overlay. A dynamic revetment (cobble/gravel berm) would be constructed along the ocean side of the foredune. The feature's dimensions would be approximately: 1,100 linear feet of cobble-sized stone (1"- 8" dia.); crest width 65-ft wide; crest height 22-ft NAVD; and slope1:5 h (resulting in about 150-ft total structure width ocean-ward from the edge of the existing dune). The total cobble fill volume would be up to about 35,000 - 43,000 cy of material (not including the excavated and replaced sand), and associated excavation for keying-in the base of the structure would be about 18,000 cy of sand. The average cobble fill volume per ft of shoreline for the proposed structure is 40 cy/ft.

The dynamic revetment would be bounded along its northern extent by the South Jetty. A 100-foot overlapping transition between South Jetty root and dynamic revetment would provide a littoral barrier to eliminate losses due to littoral transport of the cobble material to the north. The dynamic revetment would also taper at the south end to minimize flanking of the structure and to minimize other adverse impacts to the adjacent shoreline to the south. Approximately one-half of the material would feature a rounded cobble overlay, similar to material that is commonly found on many composite beaches within the Pacific NW.

The minimum life-cycle of this dynamic revetment is intended to be 30 years, with maintenance intervals of 10-15 years featuring 10-25% cobble replacement per maintenance. If the dynamic revetment is adequately maintained, the project feature may realize a 50-year life-cycle. Construction of a dynamic revetment would remediate the MCR project's vulnerabilities at the South Jetty foredune, within the context of minimizing life-cycle costs for maintaining reliable deep-draft navigation at MCR.

The dynamic revetment would be constructed by first excavating sands from the toe of the existing foredune in order to key-in the feature (which could entail a depth of sand between 5 – 8-ft depending on summer or winter profiles) and then placing cobble materials in layers. Excavation and material placement would be staged in sections and according to low-tides, in order to accommodate the challenges of periodic potential structure exposure to wave and tidal forces during storm surges. Otherwise, much of the construction would occur in the dry sands area. After construction is complete, the excavated sand would be placed at the toe of the structure to preserve the existing grade at the time of construction; any remaining sand would be used to supplement low spots in the foredune crest.

A monitoring plan would be enacted, as a formal element to this project, to document the post-construction performance of the dynamic revetment and to verify that the project feature causes no adverse impact to adjacent shore areas. The monitoring plan scope would be developed and executed in cooperation with the State of Oregon Department of Geology and Mineral Industries (DOGAMI).

The Corps located construction, storage, and staging areas to avoid and minimize impacts to wetlands and cultural resources in the vicinity. Access to the site through Ft Stevens State Park (Park) would be along the Jetty Access Road. Dune access would occur via unpaved improvement to an existing, primitive sand road (Haul Road A) that traverses the shore pine forest between the Jetty Access Road and shoreline. A small loop road enclosing an additional staging area is also proposed immediately adjacent to the dune/beach access site. There would also be limited staging and stockpile opportunity at a second, more northern existing unimproved roadway (Haul Road B), as well as in Parking Area B. Traffic would be restricted extending west on the roadway to avoid effects to the potentially historic trestle and further disturbance to the dune

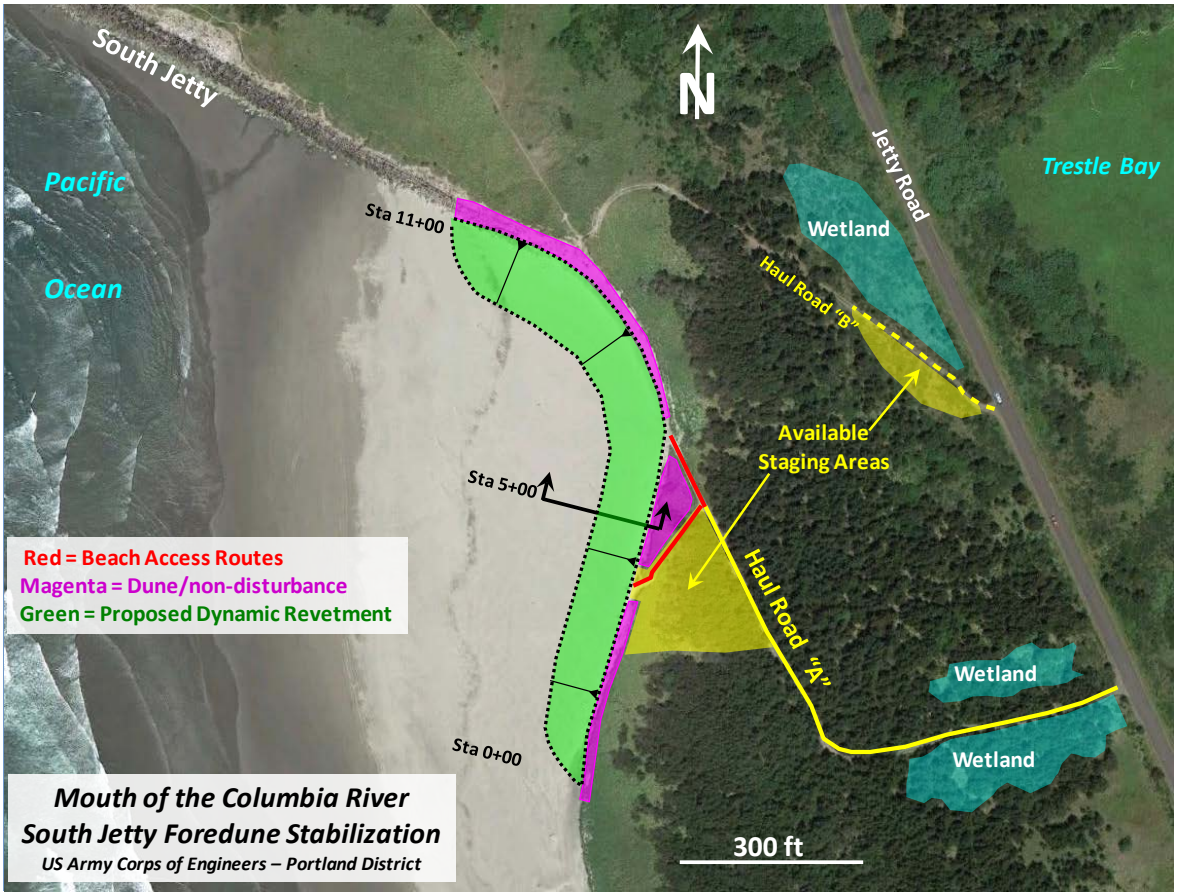

Figure 1: Construction plan layout for dynamic revetment to stabilize the MCR South Jetty foredune.

A survey of the existing vegetation to be removed including stem counts for affected shore pine would be conducted to inform the replanting plan for site restoration. The Corps would minimize the removal of vegetation and trees and removal. Shore pine replanting ratios would be no less than 1:5, removal to planting. Removed trees would be disposed of off-site at an approved location (unless the Park has identified an alternate, approved use). The Corps would minimize clearing vegetation at the dune crest as much as possible, and would limit any required clearing to leeward side of the dune in order to maintain dune stability. Post-construction restoration plans would be reviewed by the Oregon Parks and Recreation Department (OPRD) forester to ensure the replanting plan meets Park needs.

Disturbance areas would: be re-vegetated with native, in-kind plant species; follow standard planting practices; and be planted during the recommended planting season for each particular species. The Corps would replant areas that do not meet replanting survival standards. Restoration criteria include a high volume of native plantings in order to achieve a target native species coverage amount. Herbicide would not be applied, although mechanical or other

methods may be used to control weeds and unwanted vegetation. No surface application of fertilizer would occur within 50 feet of any wetland or ocean waters.

Post construction restoration would also entail minor roadway patching for damages caused by haul trucks and site restoration compliant with the Clean Water Act National Pollutant Discharge Elimination System (NPDES) permit. Haul roads would be graded and narrowed to meet pre-site conditions.

The Corps is also proposing compensatory mitigation to offset impacts to wetlands and waters of the U.S. This is described in further detail in the EA, SEA, and *Cumulative Impacts* section in this Supplement.

c. Authority, Purpose, and Need

No Updates.

d. General Description of Fill and Dredged Material

Fill material in wetlands would be clean gravel, geotextile, removable matting, or equivalent. The exact volume is unknown and depends on the equipment used, the road depth, turnout dimensions, and width required to match the topographic grade between Access Road A and the Jetty Access Road. The area of impact will not exceed 0.08 acre of wetland fill detailed further in the following sections.

Materials being removed and placed in waters of the U.S. will be clean fill, and are almost 100% sand, gravel, or cobble. The Corps received a memo concurring with this clean-fill determination through compliance with the sediment evaluation framework process.

The dune augmentation feature would key-into the existing foredune and would be comprised of a gravel bedding layer, a core of angular or rounded cobble, and a 4-ft deep rounded cobble overlay. A dynamic revetment (cobble/gravel berm) would be constructed along the ocean side of the foredune. The feature's dimensions would be approximately: 1,100 linear feet of cobble-sized stone (1"- 8" dia.); crest width 65-ft wide; crest height 22-ft NAVD; and slope1:5 h (resulting in about 150-ft total structure width ocean-ward from the edge of the existing dune). The total cobble fill volume would be about 35,000-43,000 cy of material (not including the excavated and replaced sand), and associated excavation for keying-in the base of the structure would be about 18,000 cy of sand. The average cobble fill volume per ft of shoreline for the proposed structure is 40 cy/ft. Approximately one-half of the quantity would feature rounded cobble.

The existing EA indicated that the foredune augmentation feature would be constructed from clean, upland sources. This was prior to additional evaluations regarding the benefits of using rounded cobble. Any selected material source would have and comply with all appropriate environmental compliance documentation.

e. Description of the Proposed Discharge (Fill) Site

Fill will be placed in the Territorial Sea off the coast of Oregon, in the Pacific Ocean, (Watershed: Necanicum River-Frontal Pacific Ocean; Sub Watershed: Arch Cape Creek-Frontal Pacific Ocean; HUC -- 171002010105; OR North Coast - Lower Columbia Basin # 11\21), and in interdunal, depressional wetlands (palustrine emergent and palustrine forested) located adjacent to an unimproved road west of the jetty road that traverses the neck of Clatsop Spit.

The Pacific Ocean near the Necanicum River – Frontal Pacific Watershed, North Coast Basin, is listed on DEQ's Clean Water Act Section 303 (d) list for the parameter Fecal Coliform. DEQ has also developed a U.S. Environmental Protection Agency (EPA) approved Total Maximum Daily Load (TMDL) allocation for the parameters Temperature and Bacteria in portions of the sub-basin. Temperature allocations were specific to perennial streams. Fecal Coliform criteria were developed to protect the beneficial use of Shellfish growing. Basin-specific criteria are included for pH, Total Dissolved Solids, and treatment of Sewage Wastes. None of these criteria or parameters will be affected by the proposed project actions. The project area is also in an area of Ft. Stevens State Park, which the Park leases from the Corps.

Beneficial uses of surface water within Estuaries and Adjacent Marine Waters for the Pacific Ocean in the watershed subject to the proposed project actions are listed below as posted on DEQ's website at: http://www.deq.state.or.us/wq/rules/div041/dbutables/table230a.pdf

Designated Beneficial Uses in Estuaries and Adjacent Marine Waters in the North Coast - Lower Columbia Basin (OR Basin # 11\21) Necanicum River - Frontal Pacific Ocean Watershed
Industrial Water Supply
Fish & Aquatic Life[2]
Wildlife & Hunting
Fishing
Boating
Water Contact Recreation
Aesthetic Quality
Commercial Navigation & Transportation
[2] See also Figures 230A and 230B for fish use designations for this basin. [There are no fish use designations for the portion of the Spit affected by the project.]
From: Table 230 A - North Coast Lower Columbia Basin # 11\21; OAR 340-41-0230)

1. **Wetlands**

A Wetland Delineation Report and an Oregon Rapid Wetland Assessment Protocol (ORWAP) functional evaluation were previously completed by Tetra Tech, Inc. (May, 2011). These reports covered all anticipated project actions on the Spit related to the full suite of jetty major repair and major rehabilitation projects, of which foredune augmentation was a component. However, new cultural resources information in the project vicinity became available and because of this construction limits related to the foredune augmentation changed after completion of the EA. Therefore, the existing wetland delineation was supplemented with a 2012 wetland determination. Site visits to conduct the wetland determination were conducted at the newly proposed staging areas by a Corps Regulatory Jurisdictional Specialist and a Wetland Mitigation Banking Specialist on October 3, October 23, and November 21, 2012.

Surveys were conducted under the assumption that expanded roadway widths would be no greater than 30-ft in total, and no expansion would occur at the eastern end of Haul Road A where wetlands were identified. Staff took data points at multiple locations identified as potential staging, access, and road widening areas. Obligate wetland vegetation was observed on both sides along the Haul Road A in the understory of the eastern portion of the roadway (see Figure 1). Wetland vegetation was also located on and at the base of the road fill prism of the Jetty Access Road. The Corps did not specifically delineate these wetlands boundaries. Due to the mosaic, interspersed nature of the wetlands in this setting, the Corps has assumed the entire 5-ft buffer area on either side of the eastern portion of Haul Road A is wetlands, along with the entire proposed entrance area. However, this is a conservative estimate to assume a maximum impact, as there are several upland breaks between wetlands. Though additional wetlands may be present beyond the surveyed boundary, a determination was not conducted beyond the estimated buffer because further wetland impacts would be avoided and minimized since the project staging and road widening would be limited through this area.

Wetlands at the entrance and eastern portion of Haul Road A (see Figure 1).were classified as palustrine emergent (PEM) depressional freshwater wetlands that are part of an interdunal mosaic of wetlands formed on deflation plains throughout the Spit. Wetlands along the roadway were classified as palustrine forested (PFO) depressional freshwater wetlands. Wetlands are similar to others in the vicinity, which were scored per Oregon Rapid Wetland Assessment Protocol (ORWAP) as described in the EA.

The Corps identified the area south of Access Road B as uplands from (a) the roadway to the tree line indicated by the mature shore pine canopy, and (b) from the entrance with the Jetty Access Road to the beginning of the bend in and canopy closure over the road. The area north of Access Road B had PEM wetlands and was therefore avoided as part of the staging area (see Figure 1). No wetlands were identified within 30-ft buffer adjacent to the western portion of Access Road A. The backshore staging area and loop proposed immediately adjacent to and east of the dune connecting to Access Road A was determined to include only upland characteristics. Discrete portions of the leeward side of the dune in the vicinity of the Haul Road B were also investigated and were confirmed to have upland characteristics. However, in these areas there were cultural resources and dense stands of shore pine forest.

2. **Surrounding Aquatic Resources**

The coastal margin at the MCR is subjected to vigorous environmental loading associated with seasonal variation of waves and winds, tidal action and estuarine circulation, and morphological change. The primary environmental loading factors that affect coastal navigation infrastructure and shoreline stability are incident wave action and variation of water level.

The foredune south of the jetty root is presently in a condition of advanced deterioration (see Figure 2). During the 1970's, the South Jetty foredune had a crest elevation of 30 and 40 ft North American Vertical Datum 88 (NAVD) and 50-100 ft crest width. The high-crested foredune prevents storm-induced overtopping from reaching the backshore, and it protects the narrow strip of low-lying land that separates the ocean from the jetty lagoon called Trestle Bay. The foredune is now a relatively narrow feature on an otherwise flat, low-elevation area adjacent to a tidal marsh. Between 2003 and 2007, the concave shoreline area receded more than 40 feet, further reducing the protective ability of the foredune. Presently, the foredune crest has been reduced to less than 25 ft NAVD, along much of the project's 1,100 ft reach (Figure 4).

Figure 2: Active erosion at the dune face south of the South Jetty (2010 December).

Under the present condition of wave and surge exposure, the affected South Jetty foredune is vulnerable to short-term risk of being completed overtopped and eroded by wave surge action within the next 1-3 years. Without stabilization, the foredune along the root of the South Jetty would continue to erode and recede, resulting in a possible breach through the Spit along the South Jetty Root and into Trestle Bay. It was estimated this breach could occur in 8-16 years. Such a breach would cause a secondary flow pathway to develop from the Columbia River estuary to the ocean, re-directing hydraulic flow from the existing inlet, threatening inlet stability, and disrupting navigation at the MCR. In the 1920's such a breach did occur in this vicinity. A similar breach also occurred at Grays Harbor, WA in December 1993. Rapid post-

breach intervention was required to prevent loss of navigation function at the inlet and protect the town of Westport, WA.

The area along the South Jetty has experienced profound changes since the time of jetty construction (1885-1913). Before construction, the nearshore area was dominated by a broad ebb tidal shoal with relatively shallow water depths. During the construction period for the South Jetty, Clatsop Spit accreted (accumulated) seaward following the South Jetty alignment.

The ocean entrance at MCR is characterized by large waves and strong currents and has been considered one of the world's most dangerous coastal inlets. The transition from coastal regime to oceanic is abrupt at MCR. The sea state at MCR during storm conditions is characterized by high swell approaching from the northwest to southwest combined with locally generated wind waves approaching from the south to southwest. During October-April, the seasonal average wave height and period is 9 ft (2.7 m) and 12 seconds, respectively. During intense winter storms, waves can exceed 30 ft (9 m). Individual waves having a height of 45-55 ft (trough to crest) were recorded 5 miles south of MCR in water depth of 135 ft (Moritz 2001). During May-September, average wave height and period is 5 ft (1.5 m) and 9 seconds, respectively.

As offshore waves propagate shoreward toward the MCR, the waves are modified (waves begin to shoal and refract) by the asymmetry of the MCR's underwater morphology. Nearshore currents and tidal currents are also modified by the jetties and the MCR's morphology. These modified currents interact with the shoaling waves to produce a complex and agitated wave environment within the MCR. The asymmetric configuration of the MCR and its morphology is characterized by the offshore extent of Peacock Spit on the north side of the North Jetty, southwesterly alignment of the North/South Jetties and channel, and the absence of a large shoal on the south side of the MCR.

The asymmetry of the MCR causes incoming waves to be focused onto areas which would not otherwise be exposed to direct wave action. Large waves approaching the MCR from the northwest can be refracted/diffracted (changed in direction) around the South Jetty and directed onto Clatsop Spit, including the project area. The wave environment affecting the South Jetty foredune is defined entirely by the water levels induced by tides and storms. Waves only affect the South Jetty foredune when the water level is elevated by tide and storm wave action. The present frequency of the foredune toe (13-17 ft NAVD) being affected by wave-surge action varies from 1 to 20 times per year. The South Jetty locally modifies wave action, directly affecting the project area, by inducing wave reflection off of the jetty. Additionally, a mach-stem effect can develop when waves ride along (are guided by) the South Jetty as they propagate toward shore. The cul-de-sac shape of the project's recessed shoreline and eroded foredune indicate that cross-shore transport dominates long-shore transport within the project site, and that the net direction of cross-shore transport is offshore.

Summary tidal information for the project site is provided below based on data for the MCR North Jetty, near Cape Disappointment, WA from the National Oceanic and Atmospheric Administration's (NOAA) National Ocean Service (NOS). This tidal station emulates the open coast conditions of MCR, and minimizes estuary/riverine effects of the Columbia River. For this project, relevant elevations are listed below:

MEAN LOWER LOW WATER, MLLW = -0.25 ft North American Vertical Datum (NAVD) 88
MEAN HIGHER HIGH WATER, MHHW = 7.5 ft NAVD 88
MEAN HIGH WATER, MHW = 6.9 ft NAVD 88
MEAN TIDE LEVEL, MTL = 4.0 ft NAVD 88
MEAN SEA LEVEL, MSL = 3.8 ft NAVD 88
MEAN LOW WATER, MLW = 1.0 ft NAVD 88
[1]Extreme Astronomical High Tide (at Astoria, OR) = 10.14 ft (3.09m) NAVD 88
Extreme Astronomical Low Tide (at Astoria, OR) = -1.08 ft (0.33m) NAVD 88
Augmentation Feature, Keyed-in Depth = 8.6 NAVD 88

f. Description of the Disposal (Fill) Method

Placement of cobble and gravel materials would be accomplished by land via conventional heavy construction equipment including haul trucks and bull dozers. Placement would be staged according to tides and placed sequentially in smaller segments to reduce potential wave exposure prior to completion of placement. Only clean stone would be used. Any excavated sand would be placed at the toe of, or over the top of the feature.

III. Alternatives

The preferred alternative remains the same as that described in the EA and SEA. This section only includes updated details for the foredune augmentation feature and does not include a full description of the alternatives and preferred alternative covered in the EA and SEA.

The dynamic revetment component of the preferred alternative was developed and refined to take advantage of opportunities to avoid and minimize, to the maximum extent practicable, the proposed project's ecological impacts to wetland, aquatic habitats, and species per requirements under the Clean Water Act and Executive Order (EO) No. 11990. Efforts were made to reduce the project footprint and to locate staging and access in areas already developed or previously disturbed, away from wetland and waters.

Despite these efforts, placement of fill materials to wetlands and other waters of the U.S. would occur via the following project activities: fill of wetlands for construction access; and fill in waters of the U.S. for the cobble berm/dynamic revetment design. These fill actions are water dependent or require proximity to special aquatic sites. These circumstances are described for each of the actions.

1. Cobble Berm Fill

Foredune augmentation design considered variations in the extent of the berm cross-section related to type (angular or rounded) and size of stone, slope, volume, etc. Based on new design details subsequent to the EA and 404 (b) (1) Evaluation, the design elevation would now extend below the CWA 404 jurisdictional Waters of the U.S. elevation.

[1] This elevation defines Clean Water Act Section 404 Waters of the U.S. for this project.

A dynamic revetment is composed of cobble-sized rock placed along the vulnerable reach of shore. Its purpose is to protect the back shore from wave-surge induced erosion and to reduce the level of wave run-up (and overtopping) along the protected shore face. The thickness of the berm cross-section must be sufficient to provide an increased porosity during wave attack, which reduces the degree of wave run-up on the berm cross-section. Simply paving a beach face with 1-4 ft armoring treatment of cobble material likely would not provide the effective porosity for reducing wave run-up.

These types of porous structures are very effective in dissipating incident wave action and run-up. In the Great Lakes where fluctuating water levels are problematic for conventional shore protection methods, Johnson (1987) found dynamic revetments to be an effective alternative: not vulnerable to toe scour, overtopping, or flanking. Design attributes for a dynamic revetment include: material sizing, expected deformed side-slope, crest (berm) elevation, crest (berm) width, and toe elevation (embedment below grade).

The slope aspect for dynamic revetments can vary between 1vertical (V) to 4 horizontal (H) to 1V:15H, depending upon the wave action that is acting on the berm. Increased wave action tends to flatten the slope aspect. The volume of cobble material to be placed within the berm template needs to be sufficient to allow re-working of the cross-section (by wave action) to an equilibrium cross-section shape, while still providing ample cobble thickness and shore-face coverage to protect the back shore from wave-surge run-up.

The cross-section of a dynamic revetment is intended to be dynamic, in that its slope aspect would be re-shaped by the incident wave action. As the berm is reformed by wave action, its cross-section equilibrates into a stable configuration and blends in with the adjacent shore area. The required gradation of the cobble can vary depending upon the exposure to wave action. Cobble gradation may also vary along the cross-shore aspect of the dynamic revetment, with smaller material being located along the lower part of the berm cross-section and larger material being located along the upper slope area and on the berm crest. Gradation range for cobble material generally would be within a range of 1-inch to 8-inches.

The advantages in using a dynamic revetment for shore protection rather than a hard armoring approach include lower cost, simpler construction, ability to accommodate shore-face recession (profile lowering), and reduction in adverse impacts to adjacent shoreline. In addition, the dynamic revetment approach does not require beach and dune restoration, as it can be constructed to protect the shoreline in its existing condition. For all of the above reasons, a dynamic revetment/cobble berm is the preferred alternative for design of the stabilization feature.

The Corps' goal is to construct a cobble berm that can deform in response to severe wave action. The material composing the dynamic revetment would be sized so the structure can deform, but not be dispersed by wave action. The top elevation of the berm (crest) would be high enough to prevent wave run-up from completely overtopping the berm. The crest width of the cobble berm would serve as ballast material to accommodate deformation without reducing the crest elevation of the berm. The berm crest width also would serve to provide a cross-section with sufficient porosity.

The project location provides a unique opportunity to implement a design-with-nature approach utilizing a cobble/gravel berm (i.e., dynamic revetment) that would be naturally backed by an erosional escarpment (the existing high-crested foredune).

In summary, the present foredune adjacent to the South Jetty is being eroded primarily by locally-enhanced cross-shore sediment transport (net offshore direction), and the net long-shore sediment transport is not sufficient to replace the eroded sediment. The proposed foredune augmentation needs sufficient resilience so that it does not excessively erode or become displaced by either long-shore or cross-shore transport processes affecting the project area (now or future). It is advantageous to stabilize the foredune now, before it is completely eroded, so that the stabilizing treatment can utilize the foredune as a buttress.

Additionally, the bedding layer for the preferred alternative uses gravel rather than geotextile due to concerns about exposure of the geotextile material and its incompatibility within a natural beach environment.

2. Construction, Storage, and Staging Areas

The EA identified construction and staging areas north of the jetty root and the currently preferred staging alternative. However, subsequent to finalization of the EA, areas immediately north of the jetty root near the foredune were deemed unsuitable for staging and access due to: (a) the topography of the existing dune, (b) the existence of previously unidentified historic/potentially historic resources (historic bunkers and trestle),and (c) the desire to protect the existing vegetation in this dune location. The previous staging and access locations would have: (a) been on top of the bunkers and trestle, (b) would have disturbed vegetation critical for dune stabilization immediately behind the existing root, (c) and would have required drastic grading that would have further destabilized the existing dune. For these reasons, this draft SEA updates the newly preferred staging and access locations.

The draft SEA considered multiple access and staging alternatives in the context of minimizing impacts to cultural resources, dune vegetation, and interdunal wetlands. Access to the site through Ft Stevens State Park (Park) would be along the Jetty Access Road. There would be limited staging and stockpile opportunity in Parking Area B.

Though Parking Area B is proposed for some of the staging and storage activities (thus reducing impacts by using previously disturbed areas), additional staging and access area would be required immediately adjacent to the foredune itself. Beach access and a proximal/adjacent location for rock and equipment staging and movement would be required. To reduce re-handling, to minimize interference with construction traffic flows, and to reduce interactions between construction vehicles and park visitors, staging areas closer to the work site would be required. However, driving on the beach from Parking Area B would be prohibited in order to: protect existing shore pine forest; protect proximal razor clam beds; and reduce vehicular impacts on beaches.

Two primitive sand roads (Haul Roads A and B) currently allow some access to the placement site. The northern route (Haul Road B) is free of wetlands on its south side, and would be widened to provide some staging. However, access to the beach and dynamic revetment placement site is limited by the historic jetty trestle structure which transects Haul Road B near the dune. Also, this route would have increased impacts to the shore pine forest relative to the proposed southern route (Haul Road A). For this reason, the Access Road B would be limited to use only as a potential staging area. Access Road B and the proposed staging area immediately adjacent and to the south is mostly free of trees and consists of a dominance of scotch broom and European beach grass. Traffic would be restricted from extending north or west on the primitive roadway to avoid effects and disturbance to: wetlands on the north side of the road; the potentially historic trestle; and the dune at the western end. This overall disturbance from the proposed use of Haul Road B is limited to upland areas.

Dune access would occur via unpaved improvement to an existing, primitive sand road (Haul Road A) that traverses the shore pine forest between the Jetty Access Road and shoreline. A small loop road enclosing an additional staging area is also proposed immediately adjacent to the dune/beach access site. These impacts for the loop road and staging at the western end of Haul Road A would involve ground disturbance, including removal of some of the shore pine trees. These areas were determined to be upland.

Haul Road A does have wetlands along both sides of the road at the eastern-most portion of the road where it meets the paved Jetty Access Road. Wetland fill would be required to raise grade and to provide a turning radius from the paved road to the unimproved Haul Road A; this would be considered permanent fill. Alternatives minimizing wetland impacts to a degree that such effects remained temporary were considered. These included the possibility of incorporating a temporary bridge, the use of rubber roll-up mats, or use of a conveyor belt. However, constructability and the difficulty/impossibility of complete removal of temporary wetland fill led the Corps to determine 0.08 acre of wetland impacts would be permanent. However, these wetland areas would be stabilized and reseeded with a wetland mix when the rest of the site restoration plantings are implemented.

Roadway width would be limited to a maximum of 30-ft in non-wetland areas, and sediment fencing would be installed to buffer adjacent wetlands in the vicinity. There also would be impacts to a section of the shore pine forest, but impacts would be contained and the site would be restored. Impacts to the foredune itself also would be avoided to the maximum extent practicable in order to maintain the stability and cohesiveness of the existing feature.

A value engineering study recommended using a conveyer belt to transport material from the Jetty Access Road to the foredune area on the beach. The intent was to avoid impacts to cultural and wetland resources. However, this was deemed unfeasible given the required equipment configuration and the additional impacts that would have been caused by implementing such a temporary conveyance structure.

The Corps balanced the following resource impact considerations: wetland impacts from the roadway; avoidance of cultural resources like the historic jetty trestle and old WWII bunkers; impacts to the eroding dune; and impacts to the mature shore pine forest. Wetland impacts were

avoided and minimized by using existing roads. Based on the impacts to the mature shore pine forest and cultural resources, the access alternative (Haul Road A) through the wetlands along the southern access road was considered to have fewer overall impacts compared to other access across/along the dune from the north or along the beach.

Wetland mitigation has been identified to offset impacts to wetlands and waters of the U.S. This is discussed further under the sections *Aquatic Ecosystems and Organism Determination*, and *Determination of Cumulative and Secondary Effects on the Aquatic Ecosystem*.

IV. Factual Determinations (40 CFR § 230.11)

The Corps prepared a Water Quality Findings for its Water Quality Certification (WQC) request to the Oregon Department of Environmental Quality (DEQ), which is incorporated by reference herein.

Determinations included in this Supplemental analysis and the associated SEA only include South Jetty dune augmentation. The full suite of actions and effects are described in the EA, SEA, and 404 (b) (1) Evaluation.

a. Physical Substrate Determination

Fill will be comprised mostly of previously excavated sand and clean, rounded or angular cobble stones 1-8 inches in diameter, or clean gravel. The Corps received a memo concurring with this clean-fill determination through compliance with the sediment evaluation framework process.

Approximately 3.79 acres of permanent habitat conversion and modification will occur as a result of stone placement for foredune augmentation. Sandy shoreline/intertidal substrate will be converted to rocky shoreline intertidal habitat. Generally, effects to in-water habitat would include direct effects of intertidal habitat conversion and construction actions, as well as potential indirect effects from hydraulic influence (slight, localized changes to accretion, erosion, etc).

However, waves only affect the South Jetty foredune when the water level is elevated by tide and storm wave action. The present frequency of the foredune toe being affected by wave-surge action varies from 1 to 20 times per year, mostly during winter storms. The design elevation of the dynamic revetment is lower than the current elevation of the foredune, but the bulk of the feature design and construction activities would remain mostly above Mean Higher High Water (8.6 design elevation vs. 7.5 NAVD 88, respectively). The dynamic nature of the structure will shift over time such that future slopes could flatten from a 1:5 to a 1:15 profile and may extend beyond the design elevation. However, in the future the foredune augmentation feature is not expected to extend beyond 6.9 ft NAVD.

Indirect disturbance effects due to placement activities will be localized and occur mostly during daylight hours in the summer months. Disturbance effects are expected to be of limited duration and minimal, since a majority of the placement is above MHHW and in the dry sands.

Unavoidable gravel fill will affect 0.08 acre of interdunal wetland due to construction access requirements. Most of the fill will be removed to the maximum extent practicable and the area will be reseeded with wetland plants. However, site constraints and unavoidable impacts will result in permanent fill and potential conversion to upland characteristics.

b. Water Circulation, Fluctuation and Salinity Determination

Water quality characteristics such as salinity, water chemistry, clarity, color, odor, taste, dissolved gas levels and nutrients are not likely to be affected. The Findings prepared for the WQC request included discussions addressing these parameters.

Hydraulic features such as current patterns, water circulation, velocity and salinity would remain unchanged. A dynamic revetment is "dynamically stable" so that it can adapt to a project site over time-varying topographic change (erosion). The structure's cross-section would be compliant with wave and water level forcing and would subsequently be re-shaped to an equilibrium profile to match evolving site conditions. The slope aspect of dynamic revetments would be about 2-3 times flatter than standard rip-rap revetments, due to the relatively small and dynamic material used (cobbles 1 to 10 inches verses rip-rap 3 to 5 ft diameter). Therefore, the proposed dynamic revetment feature maintains and accommodates many of coastal hydrologic processes.

Rounded cobble material proposed to be used within the dynamic revetment cross-section is more porous than conventional rip-rap and would absorb wave action, reducing turbulence and reflective dissipation. Incorporating these properties, a dynamic revetment would induce less erosion (scour) at the structure's toe and adjacent beach areas as compared to a conventional rip-rap revetment. They reduce the potential for indirect hydraulic effects adjacent to the structure, and they are more aesthetically appealing and accessible for beach recreationalists.

Relatively little habitat conversion and hydrologic effects are expected because at least half, if not all of the feature will be composed of rounded cobble. Rounded cobble tends to provide better beach function and improved transition with adjacent sand beach areas, as rounded cobble is present on many beaches within the Pacific Northwest (PAC-NW). It also provides better pedestrian function and is similar to more natural materials that have been reworked in coastal and fluvial environments. Cobble berm beaches are also a natural occurrence at the base of bluffs along the Oregon Coast.

c. Suspended Particulate/Turbidity Determinations

Discharge during inwater construction activities:

An unavoidable but minimal increase in suspended sediments in the water column is expected during the construction period when the placement site is inundated. Placement of materials by heavy equipment and sand excavation could all cause temporary and local increases in

suspended sediment and short-term turbidity. However, placement will be sequenced and timed to take advantage of low tides. Since most of the placement activity would occur in the dry sands and above MHHW, turbidity plumes would likely be an infrequent occurrence.

Temporally, effects to water quality from suspended sediment and turbidity could occur on a daily basis, but this is unlikely. Due to the large size of the material and rapid rate of settlement, this impact is expected to stay within acceptable levels for fish and wildlife species of concern. Further, turbidity levels and durations will be limited to conditions required in the State Water Quality Certifications, which include turbidity exceedence duration windows that are protective of beneficial uses such as salmonids and other aquatic life. The project is also located in a dynamic area that, when inundated, would naturally experience high levels of turbidity due to the wave transition in the surf zone. Wave and current conditions in the action area naturally contribute to higher background turbidity levels; and such conditions also preclude the effective use of isolating measures to minimize turbidity. Long-term adverse impacts from the project design or implementation are not anticipated

Effects from potential stormwater runoff will be avoided by implementation of an Erosion and Sediment Control Plan that avoids and minimizes runoff and pollutant loading associated with upland construction activities. Conserved wetlands will be adequately protected and buffered to avoid and unintended discharge or fill. Therefore, impact from the unlikely discharge of upland suspended sediments that could contribute to turbidity would be negligible.

d. Contaminant Determinations

The Corps received a memo indicating that the proposed fill met the clean-fill determination through compliance with the regional Sediment Evaluation Framework process.

Spills or leaks are expected to be infrequent and unlikely. The Corps would require the contractor to provide a spill prevention and management plan that would include measures to avoid and minimize the potential for spills and leaks and to respond quickly to minimize damages should spills occur. Equipment operating on the beach would implement Best Management Practices to contain and absorb grease and engine oils.

The Corps would implement an Erosion and Sediment Control Plan (ESCP) that would avoid discharge of any chemicals that could change the pH of waters in the vicinity. The Corps would implementing the project in stages timed with the tides so that most of the construction would occur in the dry sands and would not require any type of work area isolation.

Good construction practices, proper equipment maintenance, appropriate staging set-backs, additional Best Management Practices (BMPs), and stormwater control measures further reduce the likelihood of leaks or spills and reduce the potential extent of exposure and its associated effects. Furthermore, nominal effects are expected to be geographically limited, short term, and minor. Therefore, the Corps expects potential effects to be negligible.

e. Aquatic Ecosystems and Organism Determination

1. Fill and Removal in 404 Waters of the U.S.

Impacts to 404 waters of the US would occur in an area that is listed both as Essential Fish Habitat (EFH) for numerous species, as well as designated critical habitat for several ESA-listed species (leatherback sea turtles, green sturgeon).

The Corps received a Biological Opinion from National Marine Fisheries Service (NMFS). The Opinion evaluated the proposed action related to the greater suite of repair and rehabilitation actions, including the South Jetty foredune component. The Services concluded the entire suite of activities comprising the proposed action was not likely to adversely affect any of the listed species in the action area, with the exception of eulachon, Stellar sea lions, and humpback whales. For these species, NMFS determined that Corps actions would not result in jeopardy to the species. The U.S. Fish and Wildlife Service (USFW) also concurred with the Corps' determination that its proposed actions would have no effect or were not likely to adversely affect any of the listed species under their jurisdiction in the action area. These documents are incorporated herein by reference.

The foredune stabilization and associated actions remain within the scope of effects previously evaluated in the 2011 Biological Opinion and Concurrence Letter. USACE confirmed this in a conference call with NMFS and in an email with USFWS. Additionally, because stone placement and pile installation will not occur on the jetty proper for foredune actions, an Incidental Harassment Authorization (IHA) would not required for this foredune augmentation component of work.

The conversion of approximately 3.79 acres of dry sandy shoreline to a coarser, cobble habitat was described in the *Physical Substrate Determination* section. The calculated extent of impact was strictly based on the area of habitat converted by fill and temporary sand removal. However, the rounded cobble berm feature preserves some characteristics of a natural beach habitat structure and function, since it is similar to coastal and fluvial materials that are continuously reworked in aquatic systems. Further, as noted in the *Water Circulation, Fluctuation and Salinity Determination* section, the feature's malleable design will help maintain some of the dynamic erosional and depositional processes and conditions under which coastal species have evolved. By reducing wave run-up and the potential for over-topping and breaching, the existing foredune and associated vegetation and habitat would be preserved. Cobble berm beaches are also a regular occurrence at the base of bluffs along the Oregon Coast.

During and after implementation of its project, the resident biological community and ecological integrity of the Spit will be preserved. The coarsening of the shoreline is not expected to significantly alter the biological communities or habitats in the vicinity. Proposed construction activities for the most part have avoided wet sands and dune disturbance, and impacts from equipment access would be short-term. Most of the dynamic revetment is located in an area that is comprised of dry sands, mostly above the MHHW elevation, and is only inundated during wave and storm surge events. Aquatic species would experience limited exposure to construction activities because few, if any, would be expected to occupy the vicinity.

Also, Oregon Department of Fish and Wildlife assisted in identifying specific elevations delineating the location of the razor clam beds in the vicinity. The Corps would limit the construction boundary and vehicle passage along the beach to avoid and protect these razor clam beds and to reduce vehicular impacts on beaches. Additionally, mobile organisms are adapted to the dynamic nature of the habitat and may be able relocate.

Although ODFW and NMFS have established preferred in-water timing windows to be protective of the most sensitive fish uses in the Columbia, NMFS has recognized the difficulty of construction at the MCR and adjacent shoreline during the preferred winter window due to treacherous sea conditions at the bar, and have allowed a majority of the in-water work to be performed between April 1 and October 31th of any given year.

Effects to the aquatic ecosystem from foredune augmentation fill are expected to be negligible.

2. Fill in 404 Wetlands.

Where possible, the construction, access, and staging areas were located so that the footprint would minimize impacts to wetlands and higher value habitat features like shore pine forest and dune vegetation . Protections and BMPs would be implemented wetlands within the area. Strategic use of uplands and lower quality wetlands for site access would be undertaken to the most practical extent in order to avoid and minimize impacts. However, permanent wetland fill would occur. As noted in the *Construction Storage and Staging Alternatives* section and in the *Description of the Proposed Discharge (Fill) Site*, 0.08 acre of palustrine emergent and palustrine forested wetland fill would be required in order to construction the dynamic revetment

A wetland determination found wetlands that would be impacted by a portion of access roadway fill. Though a wetland delineation and functional score were not completed for the staging areas south of the jetty root, a previous delineation and functional assessment identified and scored similar wetlands at Clatsop Spit (Spit). Grouped service functions were scored as defined by the 2010 Oregon Rapid Wetland Assessment Protocol (ORWAP), and the depressional category was identified and ranked relatively as follows: low for hydrologic function and fish support group; and high for water quality, carbon sequestration, aquatic support, and terrestrial support. The wetlands also ranked relatively high for ecological condition and sensitivity, and low for stressors.

Long-term direct and indirect impacts to wetlands include permanent wetland fill, potential fragmentation of and between existing wetlands, soil compaction, loss of vegetation, altered hydrology, conversion to upland, and loss of ecosystem functions (water quality, flood storage, nitrogen cycling, habitat, etc.). However, it is expected that effects from wetland impacts on river or coastal functions would be negligible. Although there is no direct overland connection with the ocean, these wetlands are connected hydrologically. However, wetland fill impacts would not negatively alter greater groundwater exchange or hyporheic flow between the ocean or estuary because the wetlands are on porous, accreted land that has formed on stabilized sand shoals behind the jetties. Wetland hydrology is mostly elevation and rainfall dependent, and fill impacts would be immeasurable with regards hydrologic function at the ocean or estuary.

f. Proposed Disposal (Fill) Site Determinations

Effects to the proposed fill locations in wetland and waters of the U.S. have been captured in multiple sections of this Supplement. No new dredge disposal site is proposed.

Determination of Compliance with Applicable Water Quality Standards

The waters of the Pacific Ocean are not currently designated as outstanding or high quality water. This status requires particular attention to avoid exacerbating impairment of listed impaired parameters. The Pacific Ocean is classified as a water quality limited with a Total Maximum Daily Load (TMDL) allocation for Fecal Coliform in this sub-basin. The structure will be comprised of clean fill material, and there will not be any discharge of fecal coliform as a result of the structure or its construction. No lowering of this water quality parameter or effects to other beneficial uses are anticipated as a result of the construction and maintenance of the dynamic revetment structure. The narrative and numeric criteria, in conjunction with applicable TMDLs are protective of beneficial uses.

Protecting the beneficial uses of Commercial Navigation and Transportation is closely related to the impetus of this action. The beneficial use of Boating will also be improved since channel stability will facilitate the greater likelihood of a safe Columbia Bar crossing. The beneficial use of Industrial Water Supply is not present at, nor will it be affected by the project actions. Fish & Aquatic Life along with Wildlife are present in the area, and this project component went through ESA consultation with the Services. Hunting is prohibited on the Spit, and Fishing and clamming are not likely to be affected given the dry sands location and temporal nature of the shoreline work. Razor clam beds are being protected by prohibitions on construction traffic. Water contact recreation will not experience any deleterious effects from changes to water quality, and disruptions to access will be temporary, localized, and short-term in nature (3-6 months). Finally, the Aesthetic Quality of the beach is being maintained by the use of more natural, smaller cobble material that is similar to other cobble beaches on the Oregon Coast.

The Corps has analyzed the potential for impacts to each water quality criterion, which is presented the Water Quality Findings Report to DEQ. In summary: the Corps maintains that it would not degrade the water quality standards during construction and maintenance of the structure. Fecal coliform would not be discharged as a result of project actions. The Corps has also determined that water quality standards for Narrative Criteria, Biocriteria, Dissolved Oxygen, Total Dissolved Solids, Toxic Substances, and Turbidity would be met during construction because the Corps and its contractors would implement effective stormwater management, isolation and pollution prevention and control measures, and would strictly adhere to conditions for meeting both its NPDES permit and any additional 401 WQC conditions

The proposed action would not contribute to the pollutant load or degradation of any of listed water quality parameters. The proposed action would remain in compliance with forthcoming State 401 Water Quality Certification Conditions. Therefore, the proposed actions would be in compliance with all State and Federal water quality standards.

Potential Effects on Human Use Characteristics

The Corps has demonstrated consistency with enforceable State and local land use goals and ordinances through its Coastal Zone Management Act Consistency Determination, incorporated herein by reference.

Additionally, the Corps has determined that effects under section 404 would be negligible pertaining to the following considerations:

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

2. *Recreational and Commercial Fisheries*: Razor clam beds will be protected. There may be some access restrictions in-place on the beach to preserve public safety in the vicinity of the beach construction areas. This access restriction would be limited in geographical extent and temporal duration, as the rest of the beach would be unaffected, and the closure area would persist for a maximum of multiple months.

3. *Water-related recreation*: The proposed action would have minor adverse impacts to recreationists at Fort Stevens State Park, those participating in water-sports and beach activities near the jetty. Heavy equipment using park roads and parking lots will delay or inconvenience park visitors and water sport and beach recreationists. Park visitors and recreationists are likely to be disturbed by construction noise. A number of restrictions would be in place near the construction zones at the jetty to protect park visitors, water sport and beach recreationists, and the public. Some park roads and parking lots would likely be closed at times during construction. Access to a portion of the beach would be closed periodically at different times, which would have minor impacts to water sport and beach recreationists and anglers. However, large portions of the parks and beaches will remain open and accessible to the public, and the bulk of the construction activities are be seasonally concentrated.

   Rehabilitation of the MCR jetty system of which the foredune augmentation is a component is expected to have a long-term, positive effect on recreational vessel safety. Maintenance of the shoreline at Clatsop Spit preserves this area for recreational opportunities mentioned above. The proposed action would have no effect on utilities and public services in the area. The MCR is the gateway to the Columbia-Snake River system, accommodating commercial traffic with an approximate annual value of $20 billion dollars a year. The proposed action would have a long-term, positive effect on maintaining this vital transportation link and associated economy for the states of Oregon, Washington, Idaho, and Montana, as well as for the Nation as a whole.

4. *Aesthetics*: The revetment will not obstruct any views from adjacent properties and has been designed to be aesthetically similar to other cobble berm beaches that occur naturally along the Oregon Coast. The proposed dynamic revetment, which will extend up to 1,100 feet off of the South Jetty, will be subordinate in scale to the jetty itself, and therefore will be in keeping with the existing dominant features of the area.

5. *Parks, etc*: Impacts Fort Stevens State Park were also discussed under *Recreation* and will involve the placement of cobble, construction traffic, temporary beach and road closures, and temporary staging areas for construction equipment. The impact will be repaired and any placement of construction material will be removed and the site restored to its pre-construction state. The Corps has coordinated with the Park to avoid and minimize recreational effects as much as feasible while still accommodating an efficient completion of the project actions.

g. Determination of Cumulative and Secondary Effects on the Aquatic Ecosystem

For a determination of cumulative effects, the effects of the proposed activity have to be viewed in the context of past, present and reasonably foreseeable future actions that may impact environmental resources in the vicinity of the work. The cumulative effects of preferred alternative are addressed in detail in the EA, draft SEA, and 404 (b) (1) Evaluation.

Compensatory mitigation at the South Jetty is proposed to offset potential associated cumulative effects from the proposed action, which includes major repair and rehabilitation work as well as foredune augmentation. The breakdown of fill actions and compensatory mitigation are indicated in the table below. This Supplement addresses only new cumulative impacts to wetlands and waters that were not previously expected with respect to actions related to South Jetty foredune augmentation.

Area Affected	Impacted Acreage	Compensatory Mitigation Acreage	Compensatory Mitigation Approach	Comment
South Jetty				
Wetlands	2.65	5.30	TBD – Previously, New Creation Near Spit	Major Rehabilitation Report – Work on Jetty Proper
404 Waters	13.84	20.76	TBD – Will include input from Adaptive Management Team	Major Rehabilitation Report– Work on Jetty Proper
Wetlands	0.08	0.08	In-kind, Out-of-Basin Credits from WA Mitigation Bank near Longview	Foredune Augmentation – Access Route
404 Waters	3.79	–	Tsunami Debris Removal; Dynamic Revetment Design	Foredune Augmentation – Cobble Berm Placement

While effects of the project have been avoided and minimized to the maximum extent practicable, the project will result in the conversion of 3.79 acres of sandy shoreline habitat comprised of up to about 43,000 cy of cobble fill. Permanent fill is located in waters of the U.S.

based on the design elevation to key-in the feature to the existing foredune. Further, 0.08 acre of depressional, interdunal wetlands will be filled. Affected wetlands are assumed to be impacted for more than 1 year because complete removal of temporary fill would be impossible based on construction conditions and site constraints. For these reasons, this analysis assumed a worst-case scenario so the impacts were considered permanent.

Clean Water Act designated beneficial uses will be negligibly impacted by the foredune augmentation and the proposed staging area. These impacts were described further in the Corps' Water Quality Findings submitted to DEQ and the previous *Determinations* sections above. Most impacts are geographically limited in scope, temporary, and of short duration (one season)

The Corps' compensatory mitigation would be commensurate with project impacts, which were avoided and reduced further by the selection of the staging locations and the nature of dynamic revetment design. Because much of the functional habitat value in the general area would be preserved, the Corps is not proposing compensatory mitigation for impacts to waters based on acreage or fill volume. Compensatory mitigation in the form of tsunami marine debris removal has been proposed to offset the minimal impacts of substrate conversion and temporal construction effects. This mitigation would help protect the beach ecosystem by removing artificial debris that can have severe biological, chemical, physical effects on coastal habitat and water quality standards. This also would improve recreational and aesthetic conditions along the ocean shores, which has benefits to conditions in coastal communities. The Corps coordinated with OPRD and ODFW to determine the best way to implement marine debris removal actions in the vicinity of the project area and has incorporated guidance from the Oregon Marine Debris Partnership listed on the OPRD website.

Equivalent mitigation bank credits from would be purchased from a mitigation bank coming on-line in April near Long Beach WA. Though it is out-of-basin, (Columbia River rather than Pacific Ocean), it has appropriate, in-kind wetland credits – which are not available in Oregon in the vicinity of the affected wetlands. This compensatory mitigation is considered appropriate because: there are no mitigation banks or in lieu fee locations with service areas applicable to the project location; the affected wetland types limits the potential pool of banks with similar wetland types, and the bank selected in WA has wetland types similar to those affected; and there are project-specific limitations and constraints that preclude successful, on-site/proximal wetland restoration or creation (spatial, real-estate, recreational uses, and cultural resources at other locations on the Spit). This compensatory mitigation approach for wetlands impacts corresponds with the approach required by the Corps' Regulatory Branch.

The proposed action also would facilitate effective maintenance of the Columbia River navigation channel, as it would help preserve function of the MCR jetty system. This has beneficial socio-economic effects. The jetty system helps reduce shoaling in the main federal navigation channel and directs and concentrates currents in order to preserve sufficient depths in the main channel. While operations and maintenance dredging would continue at the MCR, this component of the proposed action is intended to avoid a breach of the jetty, which would result in migration of littoral drift into the federal navigation channel. Another benefit of reducing littoral drift into the MCR is the preservation of Clatsop Spit and portion of Fort Stevens State Park.

The South Jetty Nearshore dredge disposal site would complement foredune augmentation by providing additional littoral supplementation to help counteract erosional forces degrading the foredune. The synergistic approach of these two actions reinforces efforts to consider a design-with-nature approach.

The majority of the effects described this Supplement relate to unforeseen fill in wetlands and waters of the U.S. However, through avoidance, minimization, restoration measures and compensatory mitigation, the Corps has limited the potential impacts from the proposed action. The fill is considered, clean and is geographically limited. It will not cause degradation of water quality parameters. Negligible effects to interdunal depressional wetlands are being offset by purchase of in-kind compensatory wetland mitigation bank credits. The dynamic, deformable characteristic of the cobble berm revetment maintains some of the coastal processes while remaining compatible with the surrounding recreational and beach aesthetic. Habitat conversion from sandy to cobble substrate is being offset by tsunami debris removal, which is commensurate with the effects because it removes potentially harmful materials that could cause degradation to waters of the U.S.

In conclusion, this cumulative effects analysis considered the effects of implementing the proposed action in association with past, present, and reasonably foreseeable future Corps' and other parties' actions in and near the MCR, including the South Jetty foredune. The potential cumulative effects associated with the proposed action were evaluated with respect to each resource evaluation category and no cumulatively significant, adverse effects were identified. In addition, there are a number of actions that are ongoing or planned that would provide a cumulative, long-term improvement to aquatic and wildlife resources and habitat.

Coordination

The proposed work has been coordinated with the following agencies:

Federal
U.S. Fish and Wildlife
National Oceanic and Atmospheric Administration

State of Oregon
Oregon Department of Fish and Wildlife
Oregon Department of State Lands
Oregon Department of Environmental Quality
Oregon Parks and Recreation Department
Oregon Department of Land Conservation and Development

The EA, SEA, and 404 (b) (1) Evaluation all describe the coordination completed related to this project. As it pertains to the Clean Water Act, the project has been vetted for Agency and public comment through multiple channels and on multiple occasions.

Through the National Environmental Policy Act, the SEA incorporated an additional public comment period pertaining to the foredune augmentation changes evaluated in this Supplement.

Further, a public meeting was held for construction contractors on January 31, 2013, at the Portland District Corps offices.

Under the Endangered Species Act (ESA), on October 18, 2012, the Corps confirmed the disturbance as a result of proposed updates to the dune augmentation would remain within the scope of the existing consultation with National Marine Fisheries Service (NMFS), and that no marine mammals Incidental Harassment Authorization Permit would be required for this dune augmentation work at MCR. On February 1, 2013, the Corps confirmed with USFWS that the proposed actions would remain within the scope of the consultation and that no snowy plover monitoring would be required at this time.

The Corps sent a letter to the Oregon State Historic Preservation Office (SHPO) on January 2013. Coordination regarding the new staging area would complete this process prior to construction.

The Corps met onsite with Oregon Parks and Recreation Department (OPRD) on September 19, 2012, and again on March 18, 2013, to discuss the project, and the Corps has had regular email and phone coordination with the agency prior to and since these site visits.

Prior to construction, the Corps would complete compliance documentation with other resource agencies including the following Oregon state agencies: Department of Land, Conservation and Development (DLCD), and the Oregon Department of Environmental Quality (DEQ). The Corps Consistency Determination and Water Quality Finding have been posted for public comment by DLCD and DEQ, respectively.

The Corps has also committed to the formation of a modified interagency Adaptive Management Team (AMT) to keep resource agency partners apprised of any potential project changes or challenges during implementation. In addition, the Corps Portland District established a web site to keep the public informed about the repair/rehabilitation of the MCR jetties located at http://www.nwp.usace.army.mil/Missions/Currentprojects/MouthoftheColumbiaRiverJettyRehabilitation.aspx.

V. Findings of Compliance (40 CFR § 230.12)

a. Adaptations: No significant adaptations of the guidelines were made relative to this evaluation.

b. Alternatives: The No Action alternative was considered and subsequently rejected. Breaching and deterioration of the jetties would cause severe ecological and economic damage to the region. Multiple other options and alternatives were also evaluated resulting in the Preferred Alternative described in the 2012 EA and SEA, incorporated herein.

c. Water Quality Standards [40 CFR § 230.10(b) (1)]. Water quality certification from Oregon has been requested. The Corps does not anticipate its actions will degrade any of the water quality parameters, including those listed for the Columbia and Pacific Ocean. The Corps submitted Water Quality Findings supporting this determination.

d. Toxic Effluent Standards [40 CFR § 230.10(b) (2)]. The proposed action would not violate the toxic effluent standards of Section 307 of the Clean Water Act.

e. Endangered Species [40 CFR § 230.10(b) (3)]. The removal of sand and placement of fill would not harm any endangered species or their habitat as discussed under the Endangered Species Act of 1973. This is further demonstrated in the associated Biological Assessments along with the Biological Opinion and Letter of Concurrence from the Services obtained for the proposed action.

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) The proposed action would not result in significant adverse effects on human health or welfare, including municipal water supplies, plankton, fish, shellfish, or wildlife.

2) There would not be 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.

3) There would not be significant adverse effects on aquatic ecosystem diversity, productivity and stability due to avoidance, impact minimization, implementation of best management practices, and compensatory mitigation.

4) There would not be significant adverse effects on significant adverse effects on recreational, aesthetic and economic values.

h. Minimization of Impacts [40 CFR § 230.10(d)]. Appropriate actions to minimize potential adverse impacts would be specified in the construction contract and have been described throughout this Supplement.

1) Other alternatives were considered including the "no action" alternative for the project. These alternatives were dismissed for reasons detailed in Section III above and for reasons further described in the 2012 EA and 2013 SEA.

2) The proposed action would be in compliance with applicable State water quality standards. The Corp will obtain State 401 Water Quality Certifications prior to any inwater work or wetland fill. The Corps has a general National Pollutant Discharge Elimination System 1200-CA permit (#14926) through the DEQ that, though expired, has been administratively extended indefinitely by DEQ and remains in effect. The Corps would maintain compliance with its terms and conditions, including development of an Erosion and Sediment Control Plan prior to commencement of actions.

3) The proposed action would not violate the toxic effluent standards of Section 307 of the Clean Water Act. State water quality certification has been requested for the project.

4) Information on federally listed species and designated critical habitat was presented in the EA and SEA. Biological Assessments (BAs) were also prepared for the proposed action to address federally listed species under the jurisdiction of the NMFS and USFWS. The BAs were provided to the respective agencies for review and consultation.

   On March 18, 2011, The Corps received a Biological Opinion from NMFS indicating that the Corps' proposed actions were not likely to adversely affect any listed species, with the exception of eulachon, humpback whales, and Stellar sea lions (2010/06104). For these species, NMFS determined that Corps actions were not likely to jeopardize the existence of the species. NMFS also concluded that Corps actions were not likely to adversely affect any of the current or proposed critical habitats. There was a Conservation Recommendation to carry out actions to reverse threats to species survival identified in the Columbia River Estuary ESA Recovery Plan Module for Salmon and Steelhead.

   On February 23, 2011 the Corps received a Letter of Concurrence from USFW regarding potential effects to species under their jurisdiction (13420-2011-I-0082). The Corps' determined its actions would have no effect on listed species, with the exception of bull trout, marbled murrelets, and snowy plover. The Corps concluded that its actions were not likely to adversely affect these species or their critical habitat. The USFW concurred with the Corps' determination. USFW also included four Conservation Recommendations to protect and improve snowy plover habitat and manage attractant waste derived from construction actions.

5) The proposed project would not result in significant adverse effects on human health and welfare, including municipal and private water supplies, recreational and commercial fishing, plankton, fish, shellfish, and wildlife. Significant adverse effects on aquatic ecosystem diversity, productivity, and stability, and recreational, esthetic, and economic values would not occur. Compensatory mitigation has been proposed to offset unavoidable impacts to wetland and waters of the U.S.

6) Appropriate steps to minimize potential adverse impacts have been further detailed in the EA and SEA. These will be specified in the Environmental Protection standards prepared for the project.

With the inclusion of appropriate and practical measures to minimize adverse effects to the aquatic ecosystem, the proposed action is determined to be in compliance with the requirements of the Section 404(b) (1) guidelines.

VI. Conclusions

On the basis of the factual determinations and findings made above, the proposed fill materials would be in the overall public interest and are compliant with the Guidelines at 40 CFR Part 230 and with the requirements of Executive Order 11990 (Protection of Wetlands).