Encinitas-Solana Beach Coastal Storm Damage Reduction Project

San Diego County, California

Appendix D

404(b)(1) Evaluation

U.S. Army Corps of Engineers
Los Angeles District

December 2012

This page was intentionally left blank for duplex printing.

THE EVALUATION OF THE EFFECTS OF THE DISCHARGE OF DREDGED OR FILL MATERIAL INTO THE WATERS OF THE UNITED STATES IN SUPPORT OF THE ENVIRONMENTAL ASSESSMENT FOR ENCINITAS AND SOLANA BEACH COASTAL STORM DAMAGE REDUCTION PROJECT SAN DIEGO COUNTY, CALIFORNIA

INTRODUCTION. The following evaluation is provided in accordance with Section 404(b)(1) of the Federal Water Pollution Control Act Amendments of 1972 (Public Law 92-500) as amended by the Clean Water Act of 1977 (Public Law 95-217). Its intent is to succinctly state and evaluate information regarding the effects of discharge of dredged or fill material into the waters of the U.S. As such, it is not meant to stand-alone and relies heavily upon information provided in the environmental document to which it is attached. Citation in brackets [] refer to expanded discussion found in the Integrated Feasibility Study/Environmental Impact Statement, to which the reader should refer for details. For the purposes of this Evaluation, all fill material will be placed below high tide line and thus are considered to be placement of fill within waters of the United States.

I. Project Description [1.8; 3.4]

a. Location: [1.8.1] The study area is located along the central coast of San Diego County, California, and includes the shoreline encompassing the Cities of Encinitas and Solana Beach.

b. General Description: [3.4.1 & 3.4.5] The proposed project is a beach fill only design with periodic renourishment on separate reaches in the cities of Encinitas (Segment 1) and Solana Beach (Segment 2). The proposed alternative for Segment 1, Alternative EN-1A (Encinitas), involves sand nourishment within Segment 1 as the method of providing storm damage reduction. Under this alternative, sand would be dredged from offshore using borrow sites SO-5, MB-1, and SO-6. That material would then be placed directly onto the receiver site within Segment 1. The designed additional beach width for Encinitas is 100 ft seaward of the mean sea level (MSL) line, increasing the beach profile width to 210 ft (existing beach width plus additional proposed beach width). The initial fill volume is estimated at 680,000 cubic yards. Renourishment would average every five years. Estimated renourishment fill volumes range from 280,000 to 400,000 cubic yards. Exact volumes will be determined prior to each renourishment event based on volume needed to restore a 210-foot wide beach. The wide range of renourishment volumes reflects estimates based on low and high sea level rise scenarios. Alternative SB-1A (Solana Beach), involves sand nourishment within Segment 2 as the method of providing storm damage reduction. Under this alternative, sand would be dredged from offshore, using borrow sites SO-5 and MB-1. That material would then be placed directly onto the receiver site within Segment 2. The designed additional beach width is 200 ft seaward of the MSL line, increasing the beach profile width to 270 ft (existing beach width plus additional proposed beach width). The initial fill volume is estimated at 960,000 cubic yards. Renourishment would average every 13 years. Estimated renourishment volumes range from 420,000 to 850,000 cubic yards. Exact volumes will be determined prior to each renourishment event based on volume needed to restore a 270-foot wide beach. The wide range of renourishment volumes reflects estimates based on low and high sea level rise scenarios.

c. Authority and Purpose: [1.2 & 2.4] The purpose of the Encinitas and Solana Beach Coastal Storm Damage Reduction Project is to protect public property and reduce storm related damages to residential, commercial, and public facilities along the bluffs and shoreline; address

safety concerns associated with bluff failures; enhance recreational opportunities associated with the beach; and preserve and protect environmental resources along the shoreline. The Encinitas and Solana Beach Shoreline Feasibility Study was authorized by a 13 May 1993 Resolution of the House Public Works and Transportation Committee, as follows:

"Resolved by the Committee on Public Works and Transportation of the United States House of Representatives, That, in accordance with Section 110 of the River and Harbor Act of 1962, the Secretary of the Army, acting through the Chief of Engineers, is directed to make a survey to investigate the feasibility of providing shore protection improvements in and adjacent to the City of Encinitas, California, in the interest of storm damage reduction, beach erosion control, and related purposes."

And, a 22 April 1999 Resolution of the House Committee on Transportation and Infrastructure, that reads as follows:

Resolved by the Committee on Transportation and Infrastructure of the United States House of Representatives, That the Secretary of the Army, in accordance with Section 110 of the River and Harbor Act of 1962, is hereby requested to conduct a study of the shoreline along the City of Solana Beach, San Diego County, California, with a view to determining whether shore protection improvements for storm damages reduction, environmental restoration and protection, and other related purposes are advisable at the present time.

d. General Description of Dredged or Fill Material: [4.2.2, Appendix C]

(1) General Characteristics of Material (grain size, soil type): Three borrow sites were identified for beach compatibility with the two receiving beaches of Solana and Encinitas. The SO-6 borrow site consists of medium-grain sand with an average grain size of 0.014 inches. There is no silt overburden at this borrow site. The SO-5 borrow site consists of sand with an average grain size of 0.02 inches. There is no silt overburden at this borrow site. The MB-1 borrow site consists of medium to coarse sand with an average grain size of 0.02 inches. There is no silt overburden at this borrow site.

(2) Quantity of Material (cu. yds.): An initial volume of 820,000 cubic yards would be dredged from SO-6 for Segment 1. Renourishment material would come from borrow site SO-6 until exhausted, at which time SO-5 would provide material. Renourishment volumes ranging from 340,000 to 820,000 cubic yards would be dredged every five years. The wide range of renourishment volumes reflects estimates based on low and high sea level rise scenarios.

An initial volume of 1,180,000 cubic yards would be dredged from SO-5 for Segment 2. Renourishment material would come from borrow site SO-5 until exhausted, at which time MB-1 would provide material. Renourishment volumes ranging from 490,000 to 1,020,000 cubic yards would be dredged every thirteen years. The wide range of renourishment volumes reflects estimates based on low and high sea level rise scenarios.

(3) Source of Material: Three borrow sites were identified for beach compatibility with the two receiving beaches of Solana and Encinitas. The SO-6 borrow site consists of medium-grain sand with an average grain size of 0.014 inches. There is no silt overburden at this borrow site. The SO-5 borrow site consists of sand with an average grain size of 0.02 inches. There is no silt overburden at this borrow site. The MB-1 borrow site consists of medium to coarse sand with an average grain size of 0.02 inches. There is no silt overburden at this borrow site.

e. Description of the Proposed Discharge Site(s): [Appendix C, 3.4.1, 3.4.5]

(1) Location (map): Figures 1.8-1 and 1.8-2 in the Integrated Study.

(2) Size (acres): Sand placement would occur along 7,800 ft of the shoreline in Segment 1. Sand placement would occur along 7,200 feet of the shoreline in Segment 2. Width varies according to alternative. The selected alternative for Segment 1 is an additional 100 feet of beach width. The selected alternative for Segment 2 is an additional 200 ft of beach width.

(3) Type of Site (confined, unconfined, open water): Open water.

(4) Type(s) of Habitat: Characterized by having a narrow to medium-sized beach backed by high sea cliffs.

(5) Timing and Duration of Discharge: Duration of construction of the selected alternative for Segment 1 is 103 days. Construction duration for renourishment events at Segment 1 is estimated to be 43-103 days. Duration of construction of the selected alternative for Segment 2 is 139 days. Construction duration for renourishment events at Segment 2 is estimated to be 154-212 days. Construction is feasible year round. Dredging and beach placement would occur 24 hours per day, 7 days a week. On-beach grading of placed sands would be limited to 7 am to 7 pm 7 days a week. Mitigation reef-related activities would occur on a 24-hour, 7-day a week (24/7) basis, by operating three shifts per day. Construction duration for the mitigation reef is estimated to be 34 days.

f. Description of Disposal Method (hydraulic, drag line, etc.): [3.3.3] Material will be dredged and transported via a either a hopper dredge with pumpout capability or a hydraulic pipeline dredge.

The hopper dredge is a self-contained vessel that loads sediment from an offshore borrow site then moves to a receiver site for sand placement. The hopper dredge moves along the ocean surface dredging within the designated borrow site until the hopper is fully loaded with sediment. The hopper dredge can generally reach within approximately 0.5 mile of shore to offload. From this distance, the hopper dredge connects to a floating or submerged pump line from shore. The vessel then discharges a mixture of sediment and seawater onto the receiver site. Submerged lines would be sufficiently anchored to prevent abrasion of the ocean floor, reefs, or other seabed habitats.

The hydraulic pipeline dredge is a floating vessel equipped with a rotating cutter apparatus surrounding the intake end of the suction pipe. This dredge has the capability of pumping dredged material long distances to upland disposal areas. A pipeline is connected from the barge to the beach and discharges a mixture of sediment and seawater onto the receiver site. Submerged lines would be sufficiently anchored to prevent abrasion of the ocean floor, reefs, or other seabed habitats.

For both the hopper and hydraulic pipeline dredging methods, sand would be combined with seawater as part of the dredging process to produce a slurry. It would then be conveyed to the beach either via pipeline or a combination of hopper dredge and pipeline. Existing sand at each receiver site would be used to build a small, “L”-shaped berm to anchor the sand placement operations. The short side of the “L” is perpendicular to the shoreline and approximately the same width as the design beach for each receiver site. The long side is parallel to shore, at the seaward edge of the design beach footprint. The slurry would be pumped onto the beach into

the angle of the "L" between the berm and the bluff toe. This berm would reduce ocean water turbidity allowing all the sand to settle out inside the bermed area while the seawater is channeled just inside the long side of the berm until it reaches the open end where it would drain across the shore platform and into the ocean. As filling progresses the berm would be continuously extended to maintain its designed length. As the material is deposited behind the berm, the sand would be spread to form a gradual slope to the existing beach elevation.

Construction of the rock reef mitigation would likely be by placement of rocks off of a flat top barge using a bulldozer to push material into the ocean. Placement location would be controlled by movement of the barge and controlled pushing by the bulldozer. This Mitigation Reef will be constructed of 2 to 6 ton quarry rock with a nominal size of 3-ton, which will be distributed on the benthos in quantities resulting in 50% bottom coverage.

II. Factual Determinations

a. Physical Substrate Determinations:

(1) Substrate Elevation and Slope: [5.1]

Impact: ____ N/A __ _ INSIGNIFICANT __X__ SIGNIFICANT

The proposed project would widen the beaches to protect the bluffs from further erosion. Beach width varies based on location and alternative selected. Elevation and slope would match existing beach values.

Mitigation reef areas would see the addition of rock with a nominal size of 3.8 feet. This would create a high-relief reef approximately 3.8 feet shallower than present. Current bottom depth at possible mitigation sites range from -30 to -40 ft MLLW.

(2) Sediment Type. [5.1; Appendix C]

Impact: ____ N/A __X_ INSIGNIFICANT ____ SIGNIFICANT

Geotechnical studies indicate that the sediment proposed for beach nourishment consists primarily of medium to coarse sand. Borrow sediments are compatible with existing beach materials. The Mitigation Reef will be constructed of 2 to 6 ton quarry rock with a nominal size of 3-ton.

(3) Dredged/Fill Material Movement. [5.1; 5.4; and Appendix M]

Impact: ____ N/A _X__ INSIGNIFICANT ____ SIGNIFICANT

Dredged material will be placed onshore. Sands are expected to move down coast nourishing those beaches. Littoral movement is capable of burying sensitive habitat in the project area. Monitoring will be used to determine extent of any damage resulting and will be mitigated accordingly, see Appendix M for details.

(4) Physical Effects on Benthos (burial, changes in sediment type, etc.). [5.4; Appendix M]

Impact: ____ N/A ___ INSIGNIFICANT __X__ SIGNIFICANT

Temporary, short-term impacts from removal by dredging and burial by placement of sediments will occur. However, long-term, adverse significant impacts may occur to sensitive resources (rocky reef) as sand distributes by natural processes. Monitoring will be used to determine extent of any damage resulting and will be mitigated accordingly, see Appendix M for details.

(5) Other Effects

Impact: __X__ N/A ___ INSIGNIFICANT ____ SIGNIFICANT

(6) Actions Taken to Minimize Impacts (Subpart H). [5.4 and Appendix M]

Needed: __X__ YES___ NO

If needed, Taken: __X__ YES____ NO

Dredging and disposal operations will be monitored for effects on water quality. Best management practices will be implemented if turbidity exceeds water quality criteria. Post construction monitoring will be used to determine nature and extent of damage to sensitive resources from indirect burial. No sensitive resources will be directly buried by beach nourishment activities. Mitigation Strategy (Appendix M) has been prepared and coordinated with federal and state resource agencies to mitigate for long-term losses.

b. Water Circulation. Fluctuation and Salinity Determinations

(1) Water (refer to sections 230.11(b), 230.22 Water, and 230.25 Salinity Gradients; test specified in Subpart G may be required). Consider effects on:

Salinity ____N/A __X_ INSIGNIFICANT ____ SIGNIFICANT
Water Chemistry ____N/A __X_ INSIGNIFICANT ____ SIGNIFICANT
Clarity ____N/A __X_ INSIGNIFICANT ____ SIGNIFICANT
Odor ____N/A __X_ INSIGNIFICANT ____ SIGNIFICANT
Taste __X_N/A ____ INSIGNIFICANT ____ SIGNIFICANT
Dissolved gas levels ____N/A __X_ INSIGNIFICANT ____ SIGNIFICANT
Nutrients ____N/A __X_ INSIGNIFICANT ____ SIGNIFICANT
Eutrophication ____N/A __X_ INSIGNIFICANT ____ SIGNIFICANT
Others __X_N/A ____ INSIGNIFICANT ____ SIGNIFICANT

The proposed project is not expected to significantly affect water circulation, fluctuation, and/or salinity. [5.3]

(2) Current Patterns and Circulation (consider items in sections 230.11(b), and 230.23), Current Flow and Water Circulation.

Current Pattern and Flow ____N/A __X_ INSIGNIFICANT ____ SIGNIFICANT
Velocity ____N/A __X_ INSIGNIFICANT ____ SIGNIFICANT
Stratification ____N/A __X_ INSIGNIFICANT ____ SIGNIFICANT
Hydrology Regime ____N/A __X_ INSIGNIFICANT ____ SIGNIFICANT

The proposed project is not expected to significantly affect current patterns or circulation. [5.3]

(3) Normal Water Level Fluctuations (tides, river stage, etc.) (consider items in sections 230.11(b) and 230.24)

Tide ____N/A __X_ INSIGNIFICANT ____ SIGNIFICANT
River Stage_X__N/A ___ INSIGNIFICANT ____ SIGNIFICANT

The proposed project is not expected to have a significant impact on normal water level fluctuations. [5.2]

(4) Salinity Gradients (consider items in sections 230.11(b) and 230.25)

Impact: ____N/A __X_ INSIGNIFICANT ____ SIGNIFICANT

The proposed project is not expected to have a significant impact on normal water salinity nor is it expected to create salinity gradients. [5.3]

(5) Actions That Will Be Taken to Minimize Impacts (refer to Subpart H) [5.3]

Needed:__ __ YES __X_ NO
If needed, Taken:____ YES__X__ NO

e. Suspended Particulate/Turbidity Determinations

(1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Site (consider items in sections 230.11(c) and 230.21)

Impact: ____N/A __X_ INSIGNIFICANT ____ SIGNIFICANT

Impacts will be temporary and adverse, but not significant. Beach nourishment activities would increase turbidity levels in the surf zone during placement activities. This is expected to be highly localized and indistinguishable from normal turbidity levels. [5.3]

(2) Effects (degree and duration) on Chemical and Physical Properties of the Water Column (consider environmental values in section 230.21, as appropriate)

Light Penetration ____N/A __X_ INSIGNIFICANT ____ SIGNIFICANT
Dissolved Oxygen ____N/A __X_ INSIGNIFICANT ____ SIGNIFICANT
Toxic Metals & Organic____N/A __X_ INSIGNIFICANT ____ SIGNIFICANT
Pathogen ____N/A __X_ INSIGNIFICANT ____ SIGNIFICANT
Aesthetics ____N/A __X_ INSIGNIFICANT ____ SIGNIFICANT
Others __X_N/A ____ INSIGNIFICANT ____ SIGNIFICANT

Impacts will be temporary and adverse, but not significant. [5.3]

(3) Effects on Biota (consider environmental values in sections 230.21, as appropriate).

Primary Productivity ____N/A __X_ INSIGNIFICANT ____ SIGNIFICANT
Suspension/Filter Feeders____N/A __X_ INSIGNIFICANT ____ SIGNIFICANT
Sight feeders ____N/A __X_ INSIGNIFICANT ____ SIGNIFICANT

Impacts will be temporary and adverse, but not significant. [5.4]

(4) Actions taken to Minimize Impacts (Subpart H)

Needed: __X__ YES___ NO

If needed, Taken: __X__ YES____ NO

Dredging and disposal operations will be monitored for effects on water quality. Best management practices will be implemented if turbidity exceeds water quality criteria. [5.3]

d. Contaminant Determinations (consider requirements in section 230.11(d)): The following information has been considered in evaluating the biological availability of possible contaminants in dredged or fill material. (Check only those appropriate.) [5.1;5.3; Appendix C]

(1) Physical characteristics _X_

(2) Hydrography in relation to known or anticipated sources of contaminants _X_

(3) Results from previous testing of the material or similar material in the vicinity of the proposed project _X_

(4) Known, significant sources of contaminants (e.g. pesticides) from land runoff or percolation ___

(5) Spill records for petroleum products or designated (Section 311 of the CWA) hazardous substances___

(6) Other public records of significant introduction of contaminants from industries, municipalities, or other sources ___

(7) Known existence of substantial material deposits of substances which could be released in harmful quantities to the aquatic environment by man-induced discharge activities ___

(8) Other sources (specify) ___

An evaluation of the Geotechnical Report indicates that the proposed dredge material is not a carrier of contaminants and that levels of contaminants are substantively similar in the extraction and disposal sites and are not likely to be constraints.

e. Aquatic Ecosystem and Organism Determinations (use evaluation and testing Procedures in Subpart G, as appropriate) [5.4 and Appendix M]

(1) Plankton ____N/A __X_ INSIGNIFICANT ____ SIGNIFICANT
(2) Benthos____N/A __ _ INSIGNIFICANT __X__ SIGNIFICANT
(3) Nekton ____N/A ___ INSIGNIFICANT _X___ SIGNIFICANT
The project has the potential to indirectly bury rocky reef habitat in Segment 2. This is considered to be a sensitive habitat though not a special aquatic site. Monitoring will confirm impact and determine the extent of impacts. Mitigation has been proposed to offset these impacts.] This habitat has been designated as a Habitat Area of Particular Concern (HAPC) by the NMFS. HAPCs are discrete subsets of EFH that provide important ecological functions.

HAPCs are vulnerable to degradation (50 C.F.R. 600.815[a][8]). This habitat provides shelter and food for fish and invertebrate populations (including lobster).
(4) Food Web ____N/A __X_ INSIGNIFICANT ____ SIGNIFICANT
(5) Special Aquatic Sites:
Sanctuaries, refuges _X_ N/A ___ INSIGNIFICANT ____ SIGNIFICANT
Wetlands _X__N/A ___ INSIGNIFICANT ____ SIGNIFICANT
Mudflats _X_ N/A ___ INSIGNIFICANT ____ SIGNIFICANT
Vegetated Shallows ____N/A __X_ INSIGNIFICANT ____ SIGNIFICANT
Coral Reefs _X_ N/A ___ INSIGNIFICANT ____ SIGNIFICANT
Riffle & pool
complexes _X_ N/A ___ INSIGNIFICANT ____ SIGNIFICANT
(6)Threatened & endangered
species : ____N/A __X_ INSIGNIFICANT ____ SIGNIFICANT
(7)Other wildlife: ____N/A __X_ INSIGNIFICANT ____ SIGNIFICANT

Vegetated shallows, in the form of surf grass beds, are located near the project. Evaluation shows that these should not be significantly impacted by the selected alternatives. Short-term adverse impacts are possible; however these would be insignificant due to the magnitude and duration of expected impacts. The Corps has determined that the project will not affect two endangered species found in the area (California least tern and western snowy plover). Effects on other wildlife species are expected to be short term and insignificant.

(8) Actions to Minimize Impacts (refer to Subpart H)

Post construction monitoring will be used to determine nature and extent of damage to sensitive resources from indirect burial. No sensitive resources will be directly buried by beach nourishment activities. Mitigation Strategy (Appendix M) has been prepared and coordinated with federal and state resource agencies to provide compensatory mitigation for long-term losses.

f. Proposed Disposal Site Determinations

(1) Mixing Zone Determination (consider factors in section 230.11(f)(2))

Is the mixing zone for each disposal site confined to the smallest practicable zone?
__X_ YES ____ NO

(2) Determination of Compliance with Applicable Water Quality Standards (present the standards and rationale for compliance or non-compliance with each standard) [2.7]

To satisfy requirements of the Federal CWA, the Corps will submit this Final EIS/EIR and appropriate technical documentation to the San Diego RWQCB, tasked with implementing the CWA within the region, for their review for CWA Section 401 certification, pursuant to 33 CFR 336.1(a)(1). Upon review of the submittal, the RWQCB would issue a 401 certification. The Corps will continue to coordinate with the RWQCB throughout the CWA process and construction activities.

(3) Potential Effects on Human Use Characteristic

(a) Municipal and Private Water Supply (refer to section 230.50) [5.15]

The proposed project would have no effect on municipal or private water supplies or water conservation.

(b) Recreational and Commercial Fisheries (refer to section 230.51) [5.13]

Onshore construction may temporarily interfere with shore fishing activities in the immediate project area. Offshore construction operations (i.e., vessel traffic and dredging) may potentially conflict with local commercial fishing operations, including gear/equipment damage and the disruption of fishing locations. Impacts would be considered less than significant.

(c) Water Related Recreation (refer to section 230.52) [5.13]

During the beach construction, portions of the beach would be closed to public use. Impacts would be temporary (up to four months). During dredging and nourishment activities, proper advanced notice to mariners would be obtained and navigational traffic would not be allowed within the offshore borrow site area or mooring/discharge area. In addition, signage would be provided to inform swimmers of potential hazards. Recreational users would be required to visit a different beach or different portions of the beach during the closure periods. The displacement of recreational users to the various nearby beaches would be temporary and short-term. However, the proposed project would not impact surfing conditions or other water sports once completed.

In the long term, the beach nourishment would create a wider beach area and greater opportunities for beach activities, enhancing the beach available for recreation users. The wider beach would be a benefit to beach recreation users. Renourishment activities would create similar impacts as the initial construction.

(d) Aesthetics (refer to section 230.53) [5.7]

The proposed project would result in a wider beach, which would be a beneficial alteration of the visual character of the existing environment. During the construction phase, the visual character of the site would be affected by construction activities and the presence of construction equipment and materials; however, the construction phase is temporary, and as such, would not result in permanent effects to the visual character of the site. In the long term, the resulting wider beach would enhance the view of the beach and result in a visual benefit. Renourishment activities would create similar impacts as the initial construction.

(e) Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves (refer to section 230.54) [5.4]

The proposed project would not have any effect on national and historic monuments, national seashores, wild and scenic rivers, wilderness areas or research sites.

g. Determination of Cumulative Effects on the Aquatic Ecosystem (consider requirements in section 230.11 (g)) [6.2.4]

Overall, the Coastal Storm Damage Reduction Project plus other beach nourishment projects would cumulatively enhance sandy beach habitat to the benefit of numerous species. The potential for cumulative impacts to sensitive nearshore habitat areas at Solana Beach is anticipated to be less than significant based on project model predictions, with verification by construction monitoring and implementation of adaptive management. Therefore, there would

be no cumulative significant impacts associated with the Coastal Storm Damage Reduction Project.

h. Determination of Secondary Effects on the Aquatic Ecosystem (consider requirements in section 230.11(h)) [5.3]

Impacts of the Proposed Project are all temporary construction impacts. Significant impacts to sensitive species are avoided. Other temporary construction impacts are minimized by the design features and environmental commitments of the Proposed Project.

III. Findings of Compliance or Non-Compliance With the Restrictions on Discharge

a. Adaptation of the Section 404(b)(l) Guidelines to this Evaluation

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

b. Evaluation of Availability of Practicable Alternatives to the Proposed Discharge Site Which Would Have Less Adverse Impact on the Aquatic Ecosystem:

The discharge site is the same for all alternatives, because the project is a coastal storm damage reduction project and placement sites are limited to those that provide protection to the bluffs behind the beaches. The final array of alternatives included beach nourishment at various increments and a hybrid of beach nourishment and notchfills, as shown in the following table.

Encinitas (EN)		**Alternative EN - 1A: Beach Nourishment (100 ft; 5-yr cycle)**	**Alternative EN - 1B: Beach Nourishment (50 ft; 5-yr cycle)**		**Alternative EN-2A: Hybrid (100 ft; 10-yr cycle)**	**Alternative EN-2B: Hybrid (50 ft; 5-yr cycle)**	**Alternative EN -3: No Action**
Initial Placement Volume (cy)	High SLR	730,000	390,000		800,000	390,000	Assumes that the continued practice of emergency permitting for seawalls along the segment would continue.
	Low SLR	680,000	340,000		700,000	340,000	
Re-Nourishment Cycle	High SLR	5-yr	5-yr		10-yr	5-yr	
	Low SLR	5-yr	5-yr		10-yr	5-yr	
Added Beach MSL Width	High SLR	100 ft	50 ft		100 ft	50 ft	
	Low SLR	100 ft	50 ft		100 ft	50 ft	
Solana Beach (SB)		**Alternative SB - 1A: Beach Nourishment (200 ft; 13-yr cycle)**	**Alternative SB - 1B: Beach Nourishment (150 ft; 10-yr cycle)**	**Alternative SB-1C: Beach Nourishment (100 ft; 10-yr cycle)**	**Alternative SB-2A: Hybrid (150 ft; 10-yr cycle)**	**Alternative SB-2B: Hybrid (100 ft; 10-yr cycle)**	**Alternative SB-3: No Action**
Initial Placement Volume (cy)	High SLR	1,620,000	790,000	540,000	790,000	540,000	Assumes that the continued practice of emergency permitting for seawalls along the segment would continue.
	Low SLR	960,000	700,000	440,000	700,000	440,000	
Re-Nourishment Cycle	High SLR	14-yr	10-yr	10-yr	10-yr	10-yr	
	Low LSR	13-yr	10-yr	10-yr	10-yr	10-yr	
Added Beach MSL Width	High SLR	300 ft	150 ft	100 ft	150 ft	100 ft	
	Low SLR	200 ft	150 ft	100 ft	150 ft	100 ft	

As detailed in Section 5 of the report, each of the potential alternatives has been evaluated to determine if implementation would result in potential effects on the environment. Potential effects that require mitigation consist of covering vegetated rocky substrate within the near shore, requiring mitigation consisting of providing additional rocky substrate in the near shore that can be vegetated, as well as monitoring to record effects and whether any unexpected adverse effects occur. Other potential concerns included the need for cultural resource monitoring of the borrow areas. With the exception of the No Action Alternative, all alternatives resulted in similar categories/types of potential effects and need for mitigation, but the degree or severity of the impacts varied among the alternatives, and for the biological impacts, the acreage of necessary mitigation area varied among the alternatives. The assessment of mitigation needed to address impacts to nearshore habitat is further addressed in Appendix M.

Impacts associated with all the Encinitas alternatives were determined to be less than significant for biological resources. Although it would have greater impacts on the aquatic ecosystem than some of the other alternatives, all impacts are insignificant and Alternative EN-1A is the selected alternative.

For Solana alternatives, mitigation is proposed for the impacts identified under each alternative and the severity of these impacts is directly related to the size of the proposed beach and associated number of days for construction, with the greatest potential for impacts to occur with Alternative SB-1A and SB-2A, and reduced severity of potential impacts associated with Alternative SB-1C and SB-2B. The biological resources impacts for the Solana reach are described below.

SB-1A: Beach Nourishment (200 ft; 13-yr cycle): Sand introduced into the system would indirectly impact up to 8.4 acres of marine biological resources (benthic habitat) as a result of burial or degradation of sensitive habitats and resources, under the low sea level rise scenario. Mitigation in the form of a 16.8-acre artificial reef would be required.

SB-1B: Beach Nourishment (150 ft; 10-yr cycle) and SB-2A: Hybrid (150 ft; 10-yr cycle): Sand introduced into the system would indirectly impact up to 6.8 acres of marine biological resources (benthic habitat) as a result of burial or degradation of sensitive habitats and resources, under the low sea level rise scenario. Mitigation in the form of a 13.6-acre artificial reef would be required.

SB-1C: Beach Nourishment (100 ft; 10-yr cycle) and SB-2B: Hybrid (100 ft; 10-yr cycle): Sand introduced into the system would indirectly impact up to 1.6 acres of marine biological resources (benthic habitat) as a result of burial or degradation of sensitive habitats and resources, under the low sea level rise scenario. Mitigation in the form of a 3.2-acre artificial reef would be required.

The selected alternative for Solana is SB-1A. While smaller alternatives for Solana Beach are projected to have less impact to the aquatic ecosystem, these alternatives result in narrower widths and not only provide less protection, they also are associated with substantially more residual risk. The selected alternative maximizes shoreline protection while balancing environmental impacts against levels of residual risk. The selected alternative optimizes for all of these features and best meets all of the project objectives.

c. Compliance with Applicable State Water Quality Standards.

To satisfy requirements of the Federal CWA, the Corps will submit this Final EIS/EIR and appropriate technical documentation to the San Diego RWQCB, tasked with implementing the CWA within the region, for their review for CWA Section 401 certification, pursuant to 33 CFR 336.1(a)(1). Upon review of the submittal, the RWQCB would issue a 401 certification. The Corps will continue to coordinate with the RWQCB throughout the CWA process and construction activities.

d. Compliance with Applicable Toxic Effluent Standard or Prohibition Under Section 307 Of the Clean Water Act. [5.3]

No toxic materials/wastes are expected to be produced or introduced into the environment by this project.

e. Compliance with Endangered Species Act of 1973. [5.4]

As discussed in the attached Integrated Feasibility Study/Environmental Impact Statement, the Corps has determined the proposed project have no effect upon the continued existence of any species Federally-listed as threatened or endangered. Formal consultation pursuant to Section 7(c) of this act is not required for this project.

f. Compliance with Specified Protection Measures for Marine Sanctuaries Designated by the Marine Protection. Research, and Sanctuaries Act of 1972. [5.4]

No sanctuaries as designated by the Marine Protection, Research and Sanctuaries Act of 1972 will be affected by the proposed project. No sediments will be disposed of at designated ocean dredged material disposal sites.

g. Evaluation of Extent of Degradation of the Waters of the United States [5.3; 5.4; 5.14]

(1) Significant Adverse Effects on Human Health and Welfare

(a) Municipal and Private Water Supplies

The proposed project will have no significant adverse effects on municipal and private water supplies.

(b) Recreation and Commercial Fisheries

The proposed project will have no significant adverse effects on recreation and commercial fisheries.

(c) Plankton

The proposed project will have no significant adverse effects on plankton.

(d) Fish
The proposed project will have no significant adverse effects on fish. If beach fill would to occur during the grunion spawning season of March to August, a qualified biologist shall determine if suitable spawning habitat is present. If present, the observer will be present on the receiver beach during all predicted grunion runs and mark areas where grunion spawning occurs. All

beach construction activities shall avoid these designated spawning areas until the next predicted high tide series to allow grunion eggs to hatch.

The proposed project is projected to have adverse impacts on rocky reef through indirect burial, as discussed below.

(e) Shellfish

The proposed project will have no significant adverse effects on shellfish.

(f) Wildlife

The proposed project will have no significant adverse effects on wildlife.

(g) Special Aquatic Sites

The project has the potential to indirectly bury rocky reef habitat in Segment 2. This is considered to be a sensitive habitat though not a special aquatic site under the Clean Water Act. Monitoring will confirm impact and determine the extent of impacts. Mitigation has been proposed to offset these impacts.

(2) Significant Adverse Effects on Life Stages of Aquatic Life and Other Wildlife Dependent on Aquatic Ecosystems

The proposed project will have no significant adverse effects on life stages of aquatic life and other wildlife dependent on aquatic ecosystems.

(3) Significant Adverse Effects on Aquatic Ecosystem Diversity, Productivity and Stability

The proposed project will have no significant adverse effects on aquatic ecosystem diversity, productivity, and stability.

(4) Significant Adverse Effects on Recreational, Aesthetic, and Economic Values

The proposed project will have no significant adverse effects on recreational, aesthetic, and economic values.

h. Appropriate and Practicable Steps Taken to Minimize Potential Adverse Impacts of the Discharge on the Aquatic Ecosystem

If beach fill would to occur during the grunion spawning season of March to August, a qualified biologist shall determine if suitable spawning habitat is present. If present, the observer will be present on the receiver beach during all predicted grunion runs and mark areas where grunion spawning occurs. All beach construction activities shall avoid these designated spawning areas until the next predicted high tide series to allow grunion eggs to hatch. Prior to construction, offshore borrow and reef mitigation areas will be subjected to an underwater remote sensing survey in order to determine if submerged cultural resources are present within these areas. If cultural resources are indicated, dredging will avoid those areas. To avoid public safety impacts to beach goers, the contract specifications shall require the contractor to fence/secure areas of construction from public access, including construction staging areas and active construction areas. To minimize turbidity, discharge sediments to the beach behind L-shaped berms. To

minimize turbidity, monitor turbidity during sediment discharge and if significant turbidity is observed, modify operations (such as by slowing rate of discharge) until turbidity abates. To minimize potential for contaminant leaks and spills during construction, prepare and adhere to a Storm Water Pollution Prevention Plan and Oil Spill Response Plan. To minimize navigation impacts and threats to vessel safety, the dredge would be equipped with markings and lightings in accordance with the U.S. Coast Guard regulations. The location and schedule of the dredge would be published in the U.S. Coast Guard Local Notice to Mariners. Mitigation would be triggered only if conditions observed during the monitoring period reach thresholds identified in the monitoring plan and persist through the two year post-construction monitoring period, as there may be transitory effects and subsequent recovery. Some level of mitigation is expected for Segment 2.

i. On the Basis of the Guidelines, the Proposed Disposal Site(s) for the Discharge of Dredged or Fill Material (specify which) is (select one)

____ (1) Specified as complying with the requirements of these guidelines; or,

__ (2) Specified as complying with the requirements of these guidelines, with the inclusion of appropriate and practical conditions to minimize pollution or adverse effects on the aquatic ecosystem; or,

____ (3) Specified as failing to comply with the requirements of these guidelines.

The final 404(b)(1) evaluation and Findings of Compliance will be included with the final EIS/EIR.

Prepared by: Larry Smith Date: 6 August 2012