

**San Clemente Shoreline
Orange County, California**

FEASIBILITY REPORT SUMMARY

**U.S. Army Corps of Engineers
South Pacific Division, Los Angeles District
April 2011**



TABLE OF CONTENTS

1	MILESTONES.....	1
2	STUDY INFORMATION.....	1
2.1	Study Authority	1
2.2	Study Sponsor	1
2.3	Study Purpose and Scope:	1
2.4	Project Location/Congressional District.....	2
2.5	Prior Reports and Existing Water Projects	2
2.6	Federal Interest.....	5
3	STUDY OBJECTIVES.....	5
3.1	Problems and Opportunities.....	5
3.2	Planning Objectives	6
3.3	Planning Constraints.....	6
4	ALTERNATIVES	7
4.1	Plan Formulation Rationale.....	7
4.2	Management Measures and Alternative Plans	7
4.3	Final Array of Alternatives	9
4.4	Comparison of Alternatives	9
4.5	Key Assumptions	10
4.6	Recommended Plan	11
4.7	Systems / Watershed Context.....	11
4.8	Environmental Operating Principles	11
4.9	Peer Review	12
5	EXPECTED PROJECT PERFORMANCE.....	12
5.1	Project Costs	12
5.2	Equivalent Annual Costs and Benefits	13
5.3	Cost Sharing.....	13
5.4	Project Implementation	14
5.5	Operation, Maintenance, Repair, Rehabilitation, and Replacement (OMRR&R)	14
5.6	Key Social and Environmental Factors.....	14
5.7	Stakeholder Perspectives and Differences.....	14
5.8	Environmental Compliance	15
5.9	State and Agency Review.....	15
5.10	Certification of Peer and Legal Review	15
5.11	Policy Compliance Review.....	15

San Clemente Shoreline Orange County, California

1 MILESTONES

Feasibility Scoping Meeting:	10 JAN 2002
Alternative Formulation Briefing:	26 APR 2010
AFB Guidance Memorandum:	11 MAY 2010
Draft Report Guidance Memorandum:	02 DEC 2010
Division Engineer Transmittal:	08 APR 2011
Received at CECW-PC:	11 APR 2011
CWRB Briefing:	12 MAY 2011
30-Day S&A Review start:	24 MAY 2011
30-Day S&A Review end:	23 JUN 2011
FEIS filed with EPA:	25 AUG 2011

2 STUDY INFORMATION

2.1 Study Authority

Section 208 of the Flood Control Act of 1965 (Title II of Public Law 89-298):

“The Secretary of the Army is hereby authorized and directed to cause surveys for flood control and allied purposes, including channel and major drainage improvements, and floods aggravated by or due to wind or tidal effects, to be made under the direction of the Chief of Engineers, in drainage areas of the United States and its territorial possessions, which include the localities specifically named in this section. ... Coasts of Washington, Oregon, and California to determine advisability of protection work against storm and tidal waves.”

Energy and Water Appropriations Act of 2000, Public Law 106-60, 29 September 1999:

“The Committee recommendation includes funds for the Corps of Engineers to conduct a reconnaissance study investigating shoreline protection alternatives for San Clemente, California.”

2.2 Study Sponsor

The non-Federal sponsor for the feasibility study and plan implementation is the City of San Clemente, California.

2.3 Study Purpose and Scope:

This feasibility study provides an interim response to the study authorities. The purpose of this study is to:

- Describe existing and future without-project conditions along the coast of the City of San Clemente in Orange County, CA and identify problems and opportunities to reduce storm damages, improve public safety, increase recreation opportunities, and protect the environment.

- Formulate and evaluate an array of alternatives and recommend the one that most effectively addresses these problems and complies with local, state, and Federal laws and regulations. Four accounts, National Economic Development (NED), Environmental Quality (EQ), Regional Economic Development (RED), and Other Social Effects (OSE), are used to evaluate the plans.

2.4 Project Location/Congressional District

The San Clemente Shoreline Feasibility Study area, as presented in **Figure 1**, is located along the Pacific Ocean coastline in the City of San Clemente, Orange County, California. San Clemente is the southernmost city in Orange County and is bounded by the Camp Pendleton Marine Base and San Onofre State Beach Park to the south; and to the north, by the communities of Capistrano Shores and Dana Point. The total study area encompasses the City of San Clemente and extends from San Mateo Point, located at the southern boundary of the City, to Dana Point Harbor for a total distance of approximately 12 kilometers (7.5 miles). San Clemente lies in the 44th Congressional District, represented by Congressman Ken Calvert (R).

2.5 Prior Reports and Existing Water Projects

There are no existing Federal Shore Protection Projects in the Study area. The following reports are being reviewed as directed in the study authorization:

1. *State of the Coast Report, San Diego Region, River Sediment Discharge Study Report*, Corps of Engineers, 1988. This report presents the findings of a study estimating the sediment delivery to the coast from streams and watersheds draining to the California Coast in the San Diego Region, which extended north to the Dana Point headlands. It concludes that 90% of the average annual yields of sands came from major rivers and the other 10% yielded from coastal streams.
2. *State of the Coast Report, Coast of California Storm and Tidal Wave Study, San Diego Region, Littoral Zone Sediments Report*, Corps of Engineers, 1988. This report presents the findings from the collection, analysis, and interpretation of sedimentologic data from the littoral zone. From the findings, littoral segments along the southern California coast and the most likely transport direction within each of these littoral segments are defined.
3. *State of the Coast Report, San Diego Region, Historic Wave and Sea Level Data Report*, Corps of Engineers, 1988. This report presents statistically analyzed historic wave data and recent wave hindcasts for Southern Hemisphere swells and tropical storms that have impacted the San Diego region. The tide regime, historic and predicted extremes of sea level, and a chronology of extreme storm events are also presented.
4. *State of the Coast Report, Coast of California Storm and Tidal Wave Study, San Diego Region, Main Report*, Corps of Engineers, 1991. This report suggests that the condition of the beaches in the future will be governed by cycles of accretion and erosion similar to those of the past 50 years, but with accelerated trends toward erosion because of the reduction in fluvial delivery due to impediment by dams and river mining, the influence of Oceanside Harbor interrupting alongshore sediment transport, and the increasing rate of sea level rise.
5. *Wave Information Studies of US Coastlines, Southern California Hindcast Wave Information*, Corps of Engineers, 1992. This report presents hindcast wave information

from 1956 to 1975 for the region south of Point Conception to the Mexican border. The sources of wave energy and local effects that control the wave climate included in this report consists of northern Pacific swell, east Pacific wind fields and associated waves, localized effects such as sheltering and diffraction by islands, and meso-scale meteorological systems such as land-sea breezes.

6. *Strategic Rail Corridor Network (STRACNET) and Defense Connector Lines*, Military Traffic Command, Transportation Agency, 1998. This study updates the designation of the Strategic Rail Corridor Network (STRACNET) and its associated connector lines to verify that the rails meet defense readiness requirements for maintenance condition, clearance, and gross weight capability. STRACNET maintains a rail line running parallel to the coastline throughout the City of San Clemente.
7. *Oceanographic Design Conditions for the Repair of the San Clemente Pier*, Moffatt & Nichol Engineers, 1983. This report documents oceanographic data from the 1982-1983 winter storms, which destroyed approximately 134 meters (440 feet) of the San Clemente Pier. Design suggestions from this data and previous storm data are proposed for the repair of the Pier.
8. *Beach Width and Profile Surveys*, City of San Clemente, 2000 & 2002. Results of beach width measurements taken by the City at 16 locations in 1958, 1981 and 1999 are presented. Also, results of benthic elevations along the Pier from 1981 to the present are provided. The data indicates that there has been a significant increase in the loss of sand along the City's coastal stretch.
9. *Draft Mitigated Negative Declaration, Marblehead Coastal Beach Replenishment Project*, City of San Clemente, 2000. This CEQA document describes a private beach nourishment project along the San Clemente shoreline.



Figure 1 Project Map

2.6 Federal Interest

The reconnaissance phase of the study was initiated on March 28, 2000. This phase of the study resulted in the finding that there was a Federal interest in continuing the study into the feasibility phase. Analysis of alternatives identified a National Economic Development (NED) Plan. Federal participation for a coastal storm damage reduction project requires an alternative to display benefits exceeding costs, including up to 50% Recreational benefits for total justification. The NED Plan displays the highest net benefits, least environmental impacts, and a Benefit-Cost ratio of 1.4 to 1.

3 STUDY OBJECTIVES

3.1 Problems and Opportunities

Prior to the 1990's, the beaches within the study area were marginally stable as sufficient sediment was supplied from San Juan Creek to the Oceanside littoral cell. This was prior to upland urban development that deprived the beaches of this sand supply causing the system to become "sand starved". Since the 1990's, the beaches in the study area have experienced gradual erosion due to the decrease of fluvial sand supply resulting from the damming and concreting of creeks and rivers, and urban development. As a result, the beaches provide minimal protection against storm-induced damages to the railroad and public facilities.

As a consequence, storm damages have occurred in the past (e.g. 1964, 1983, 1988 and 1993), as the protective buffer beach width was narrow, particularly in the winter season. The narrowing of the beaches along the shoreline has subjected the public facilities to wave-induced damages. These facilities include the Marine Safety Building, public restrooms, lifeguard stations, parking areas, and concession stands. **Table 1** shows the historical damages to public facilities along the shoreline. The documented historical beach width above the Mean Sea Level (MSL) line between T Street and Mariposa Point was as narrow as 25 meters (82 ft) in the winter months (USACE-SPL, 1991). The meteorological conditions of El Nino occurred in the years 1983, 1988, and 1998. The majority of repairs in the years of 1983 and 1988 were due to damages to the San Clemente Pier. The City spent \$2,109,000 in Pier repairs in 1983 and \$2,305,000 in 1988. Also, repair costs for a revetment in the community of Capistrano Shores totaled \$288,000. In addition, the City is spending \$5,000 per year to use a tractor to reduce the steepness of the shoreline.

Along the shoreline of San Clemente, a lack of sediment supply to the shoreline has resulted in chronic, mild, long-term erosion. The LOSSAN railroad corridor is a vital link for passenger and freight service and has been designated as a Strategic Rail Corridor by the Department of Defense. As the protective beach lessens over time and is eventually lost, it is expected that storm waves will act directly upon the railroad ballast, significantly threatening the operation of the LOSSAN railroad line. The narrowing beaches are also expected to subject ancillary beachfront public facilities to storm wave-induced damages, and further reduce recreational space on an already space-limited beach.

Table 1 Historical Damages Recreational Facilities (October 2010 price level)

Year	Reason for Expenditure	Amount	Comments
1983	Facility Protection/Storm Damage Repair	\$3,277,000	El Nino Storms
1988	Facility Protection/Storm Damage Repair	\$3,120,000	El Nino Storms
1994	Storm Damage	\$21,600	
1995	Storm Damage Repairs	\$7,200	General Repairs
1996	Storm Damage Repairs	\$16,500	General Repairs
1997	Facility Protection/Storm Damage Repair	\$54,000	Repair of Marine Safety Sheet Pile
1998	Storm Damage Repairs	\$376,000	General Repairs
1999	Storm Damage Repairs	\$52,000	General Repairs
2000	Storm Damage Repairs	\$14,400	General Repairs
2001	Storm Damage Repairs	\$63,000	General Repairs
2003	Facility Protection	\$202,000	Repair of Marine Safety Sheet Pile

3.2 Planning Objectives

Based on the analysis of the identified problems and opportunities and the existing conditions of the study area, planning objectives were identified to direct formulation and evaluation of alternative plans. These objectives are:

- Reduce the potential for storm damages to facilities located along the coast of the City of San Clemente including recreation beach facilities and the LOSSAN Rail Corridor.
- Restore and maintain recreation use along the Pacific Coast of the City of San Clemente.

Alternatives are formulated to maximize storm damage reduction and minimize cost. To be recommended, their benefits must exceed their costs by NED criteria. Improvements to safety and recreational opportunities resulting from any alternative are considered incidental to the main objective of reducing storm damages. All alternatives must undergo both National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA) review processes.

3.3 Planning Constraints

The planning constraints and considerations for this study are the following:

- Impacts to the nearshore ecosystem that supports commercial lobster, fishing industries, and snorkeling activities;
- Impacts on the opportunities for surfing along the Pacific Coast of the City of San Clemente;

- Impacts to any critical habitat that supports Federal or State threatened and endangered species;
- Impacts on water quality characteristics along the coast and near shore areas of the City of San Clemente;
- Impacts on cultural and historic features located in the Study area;
- Impacts on air quality conditions within the study area.

4 ALTERNATIVES

4.1 *Plan Formulation Rationale*

Alternatives to address the reduction of potential storm damages were developed by varying levels of protection such as protecting only against frequent minor storm events as compared to protecting against the less frequent major storm events. Consideration was also given to protecting certain reaches of the study area as compared to several reaches or the entire study area. For the planning objective involving restoration of beach area for recreation use, consideration is also given to different levels of restoration involving very wide beaches that may only be needed on the highest peak use days, as compared to narrower beaches that are needed for the more frequent peak use days. Alternatives for this objective are also looked at by study reach, where some reaches may have minimal use for recreation. Screening of these alternatives considered much of the evaluation criteria stated above including economic costs and benefits, environmental impacts, and significant impacts to those items identified in the planning constraints. Measures to avoid and minimize such impacts were incorporated into the alternative plans as applicable. This development and screening process led to identifying a set of final alternative plans that were examined in detail using the system of accounts and tradeoff analysis such that decisions can be made on the best plans from NED, Environmental Quality (EQ), Other Social Effects (OSE), and Regional Economic Development (RED) standpoints and a locally preferred standpoint. From these plans, the NED plan was selected for recommendation to Congress for authorization.

4.2 *Management Measures and Alternative Plans*

Available methods to eliminate or reduce coastal storm damages and shoreline erosion include seawalls and revetments, beach nourishment-with or without groins, and offshore breakwaters. An alternative measure is a feature or activity at a site, which address one or more of the planning objectives. A wide variety of measures were considered, some of which were found to be infeasible due to technical, economic, or environmental constraints. Each measure was assessed and a determination made regarding whether it should be retained in the formulation of alternative plans. The management measures that became the alternative plans followed the guidelines described below. After reviewing the possible alternatives that were considered for the project only the beach fill alternatives were carried forward into the final array. Although all of the screening criteria were deemed important, the primary screening criteria included potential permanent and temporary impacts on Essential Fish Habitat, inconsistencies with the Coastal Zone Management Act, and project costs. Construction footprints for either breakwaters or groins would potentially have a permanent impact on Essential Fish Habitat. Consistency with the Coastal Zone Management Act was a criteria for eliminating breakwaters, groins and revetments. The high cost of implementing the remaining alternatives, compared to beach nourishment, would not maximize NED benefits and achieve the Planning Objectives.

Technical Feasibility - The recommended plan presented should be complete and sound, and in sufficient detail to allow development of engineering plans and specifications.

Economic Feasibility - Any potential project that is in the Federal interest must display feasibility by satisfying benefit-cost (B/C) criteria. Generally, this ratio must be greater than one to allow Federal participation in continued study and any project proposal. In addition, the sponsoring agency is required to show their ability and willingness to fund their share of any recommended project as required by the Principles and Guidelines.

Environmental Impacts - Applicable environmental requirements must be met for a feasibility level study. Environmental acceptability must be ascertained; and adverse impacts should be avoided if possible or minimized if avoidance is not possible. The screening of alternatives based on environmental acceptability limitations are done with respect to Federal environmental statutes. Federal examples of these include the Coastal Zone Management Act (CZMA), Endangered Species Act of 1973, Magnuson-Stevens Fishery Management and Conservation Act, 1996 amendments (M-SFMCA) and the Fish and Wildlife Coordination Act (FWCA). The California Coastal Commission currently interprets the CZMA in such a way that favors almost any type of shore protection over rock revetments and/or seawalls, especially in areas where there is a lot of public beach use and recreation. A revetment of this size would have very little chance of obtaining a Coastal Consistency Determination.

Public Acceptability - The alternative options and plans should be acceptable to the local residents, agencies, organization, and the non-Federal sponsor(s), as well as the interested State and Federal agencies. The local sponsor has indicated that they are severely constrained by public opinion and cannot support any recommendation that meets with severe public opposition. Unacceptable plans include any visible offshore structure and any structure that significantly impedes beach access, such as rock revetments. Local, well organized and well funded citizens groups have expressed strong opposition to revetments both in public meetings and in litigation. Any proposed project including revetment would encounter severe opposition from these groups.

Table 2 compares the management measures to the evaluation criteria.

Table 2 Comparison of Evaluation Criteria

Management Measure	Meets Purpose and Need	Technically Feasible	Economically Feasible	Environmentally Acceptable	Acceptable to Public
Beach fill	Yes	Yes	Yes	Yes	Maybe
Managed Retreat	Maybe	Yes	No	No	Maybe
Revetment	Maybe	Yes	Maybe	No	No
Seawall	No	Yes	Yes	No	No
Groin	Yes	Maybe	No	No	No
Visible Offshore Breakwater	Maybe	Yes	No	No	No
Submerged Reef	Maybe	No	No	Maybe	Maybe

4.3 Final Array of Alternatives

The beach nourishment alternative was identified as the only viable protection alternative given the environmental constraints of the study area. The final array of alternatives included beach nourishment widths ranging from 10-m to 60-m wide. The economic optimization procedure is based on selection of beach fill alternatives which produces the NED plan. The NED plan is developed by considering the recreational potential and storm damage reduction of various beach fill configuration alternatives and optimization based on the average annual benefits and the benefit/cost ratio. The only optimization parameter presented is the dimension of the sacrificial beach width of the cross-sectional design profile. Base beach width alternatives, beyond the current conditions of the beach, were considered in this study, however, the residual with project damages are minimal with the existing beach, so the benefits of maintaining a wider beach are marginal. The storm damage reduction benefits, in this study, are derived from maintaining the existing beach conditions by constructing a sacrificial beach. The twelve alternatives evaluated consist of sacrificial beach widths (m) = {10, 15, 20, 25, 30, 35, 40, 45, 50, 60}.

4.4 Comparison of Alternatives

ER 1165-2-130 restricts incidental recreation benefits to an equal amount of coastal storm damage reduction benefits when the project's storm damage reduction benefits on their own do not justify the project. All of the alternatives analyzed do not possess a B/C ratio greater than 1 on coastal storm damage reduction benefits alone. Therefore, each alternative has a restricted recreational benefit equal to the amount of coastal storm damage reduction benefits for the alternative. NED plan selection calls for the alternative with the greatest amount of net NED benefits, based on storm damage reduction benefits only, to be designated as the NED plan. The alternative with the greatest net NED benefits is Alternative 2 – 15 meter beach fill. The net annual NED benefits for Alternative 2 for storm damage reduction only are -\$759,626. Taking into account the recreation benefits, Alternative 2 has a benefit to cost ratio of 1.4 to 1.

Alternatives 1 and 3 (10 meter and 20 meter beach fills, respectively) both express lower net annual storm damage reduction benefits. The 10 meter plan also requires a higher annual cost

than the 15 meter plan due to the need for more frequent re-nourishments (roughly 11 re-nourishments needed as opposed to 8 over the project lifetime). The 20 meter plan and all plans wider require a higher annual cost due to much higher sand costs. The 15 meter plan displays the highest B/C ratio based on storm damage reduction benefits and recreation combined and the greatest net NED benefits based on storm damage reduction benefits.

4.5 Key Assumptions

The LOSSAN railroad line is constructed on conventional elevated crushed rock ballast along the base of the entire study area's coastal bluff. The railroad line is a prominent feature that completely separates the active coastline from the coastal bluff and adjacent backshore development. The LOSSAN railroad line is a vital transportation link for passenger and freight service. In addition, the Department of Defense has designated this right-of-way as a Strategic Rail Corridor with great significance to National defense. Railway traffic service delays occur when storm wave run ups exceed the elevation of the Southern California Regional Railroad Authority (SCRRA) protective revetments or the crest of the railroad ballast in the segments without a revetment.

Due to chronic beach erosion in recent years that resulted in storm wave attack directly against the railroad corridor, the SCRRA and OCTA have constructed un-engineered riprap revetment segment by segment in the San Clemente area where the railroad ballast and tracks are vulnerable to storm wave-induced damages. The SCRRA has been side-dumping riprap stones in a random but controlled manner along the most critical segment between North Beach and the Marine Safety Building to mitigate wave-induced impacts on the railroad tracks. The maintenance practice of adding additional stones to the existing under-designed revetment has cost the SCRRA an average of \$300,000 over every three-year period. The cumulative impact of stone placement over the years has been a curtailment of lateral beach access.

In May 2003, the California Coastal Commission (CCC) proposed changes to the current maintenance plan. The CCC has significant concerns regarding the impacts of the current maintenance plan in regards to natural sand supply and recreational resources. In order for the SCRRA to get a permanent permit for the existing revetment, the SCRRA must convince the CCC that the revised maintenance plan addresses these impacts. Currently, Metrolink is committed to maintaining existing revetment areas based on the terms provided in the California Coastal Commission Consistency Certification dated May 23, 2003 (CC-033-03). The Certification identifies a "limit line" defined as the line where the rock meets the sand. This limit line establishes the revetment slope of 1H:1V. Metrolink has committed to not construct or place additional riprap to flatten the slope of the existing revetment seaward of this line. To ensure the slope of the existing revetment remains unchanged, Metrolink intends to maintain this revetment through the strategic placement or "keying in" of rock. The permit for the maintenance plan pertains to the sections of the railroad that are protected by a revetment. Reach 6, our project area, does not have a revetment currently in place, therefore, the option of "keying in" of rock is not considered.

The process for implementing protective measures beyond those covered by the California Coastal Commission's Certification would be time consuming – several years at the minimum. It is economically unreasonable that railway parties would wait until an imminent danger existed, given the strategic nature of the LOSSAN corridor. Additionally, the City Manager of the City of San Clemente has declared the City support for the construction of a seawall, and to successfully navigate the current regulatory process to protect the rail corridor along the San Clemente shoreline, OCTA and Metrolink would tend to pursue the construction of seawalls,

with various funding partners, in lieu of revetments as the need arises. For these reasons, the study has adopted a 8 meter (26 ft) beach width criterion for the point at which the SCRRA would construct a seawall to protect the railroad. This 8-meter (26-ft) criterion has been adopted in that it coincides with the 1% chance of storm erosion potential and conforms to the typical FEMA goal of urban flood protection for insurance removal.

The long-term comprehensive solution of seawall construction is dependent upon shoreline placement entering the 8 meter (26 ft) zone. Within a given reach, the model's triggering mechanism for seawall construction requires between 300 and 500 meters (984 to 1640 ft) of shoreline to be within the 8 meter (26 ft) criterion. However, this seawall construction does not eliminate the potential for storm induced damage prior to its construction. Emergency storm related damages to the existing revetment as well as the areas protected only by the ballast (such as Reach 6) will remain a possibility until the long-term seawall solution is in place. It is probable that an emergency repair may be applied to the damaged cell prior to the comprehensive upgrade or construction of a newly designed seawall during a severe storm event.

Therefore, the railroad is assumed to be permanent and always exist throughout the period of analysis, acting as a protective structure and fixing the position of the shoreline. As such, the railroad is considered the landward boundary and no storm damages are considered landward of the railroad.

4.6 Recommended Plan

The recommended plan calls for initial construction of a 15-meter (50-foot) wide beach nourishment project along a 1,040 meter (3,412 ft) long stretch of shoreline using 192,000 m³ (251,000 yd³) of compatible sediment, with periodic renourishment on the average of every 6 years over a 50-year period of Federal participation, for a total of 8 additional nourishments. This plan would provide coastal storm damage reduction throughout the project reach and maintenance of the existing recreational beach. The project is expected to have minimal impacts to environmental resources; additionally, a comprehensive monitoring and mitigation plan has been incorporated in the project in the event that impacts to habitat result. Monitoring of the environmental resources will be for each construction event. Additionally, physical monitoring of the performance of the project will be required annually throughout the 50-year period of Federal participation.

4.7 Systems / Watershed Context

Surrounding watershed activities and sedimentation trends were included in the sediment budget for the study, which ultimately affected coastal engineering design of alternatives.

4.8 Environmental Operating Principles

The study addresses the USACE Environmental Operating Principles as below:

- *Strive to Achieve Environmental Sustainability*
 - Adaptive management, through project monitoring, of the renourishment events will help to minimize potential environmental impacts
- *Recognize Impacts on the Physical Environment*
 - Construction outside seasonal habitat windows
 - Minimize impacts on environmental resources/habitats

- *Seek Balance and Synergy Among the Project and Environment*
 - Recommended Plan supported by Sponsor and Resource Agencies
- *Accept Responsibility and Accountability*
 - NEPA, FWCA, M-SFMCA, and ESA requirements met
- *Mitigate Cumulative Impacts on the Environment*
 - Minimize impacts on surrounding habitats through adaptive management
- *Provide Greater Understanding of Environmental Impacts*
 - Communicate impacts to stakeholders and the public
- *Respect Views of Others Interested in the Project*
 - Actively listen/respond to and incorporate public concerns

4.9 Peer Review

All work products were reviewed through Agency Technical Review (ATR), Independent External Peer Review (IEPR), and Public Reviews. Major comments included:

- Railroad Reach Conversion Criterion assumptions;
- Sediment Budget analysis;
- Assumption of Beach Performance;
- Analysis of storm-induced cross-shore sand transport and beach change; and
- Analysis of impacts of the NED Plan on the environmental resources.

5 EXPECTED PROJECT PERFORMANCE

5.1 Project Costs

A project cost summary for initial and continuing construction is provided in **Table 3**.

Table 3 Cost Summary (January 2011 Price Levels)

<u>Construction Item</u>	<u>Cost</u>
Lands & Damages	\$98,000
Elements	
Environmental Monitoring	\$4,400,000
Physical Monitoring	\$7,600,000
Beach Replenishment (Mob/Demob)	\$26,000,000
Beach Replenishment (Dredging Cost)	\$43,800,000
Subtotal	\$81,900,000
Preconstruction Engineering & Design (PED)	\$8,500,000
Construction Management (E&D, S&A)	\$5,500,000
Total Cost (Initial and Continuing Construction)	\$96,000,000

5.2 Equivalent Annual Costs and Benefits

A summary of all project costs and benefits computed to an annual equivalent basis is provided in **Table 4**.

Table 4 Equivalent Annual Benefits and Costs
San Clemente Shoreline, Orange County, California
(January 2011 Price Level, 50-Year Period of Analysis, 4.125 Percent Discount Rate)

Item	Cost
Investment Costs	
Total Project Construction Costs	\$96,000,000
Interest During Construction	\$56,000
Total Investment Cost	96,000,000
Average Annual Costs	
Interest and Amortization of Initial Investment	\$2,144,000
OMRR&R	\$0
Total Average Annual Costs	\$2,144,000
Average Annual Benefits	\$3,045,000
Net Annual Benefits	\$901,000
Benefit-Cost Ratio	1.4 to 1
Benefit –Cost Ratio (computed at 7%) ¹	1.3 to 1

¹ Per Executive Order 12893

5.3 Cost Sharing

A summary of the apportionment of the project first costs, including associated costs, between the Federal government and the non-Federal Sponsor is provided in **Table 5**.

Table 5 San Clemente Shoreline, Orange County, California – Cost Sharing
(January 2011 Price Level)

	Federal Cost	Non-Federal Cost	Total Cost
Initial Construction			
PED	\$616,000 (65)	\$332,000 (35)	\$948,000
LERR&D	\$0	\$12,000	\$12,000
SDR Costs	\$6,568,000	\$3,525,000	\$10,093,000
Subtotal (Initial Construction)	\$7,220,000 (65)	\$3,890,000 (35)	\$11,100,000
Total Project	\$49,000,000 (51)	\$47,000,000 (49)	\$96,000,000
Associated Costs	\$0	\$0	\$0
Total w/Associated Costs	\$49,000,000 (51)	\$47,000,000 (49)	\$96,000,000

5.4 Project Implementation

The non-Federal sponsor is the City of San Clemente. The City of San Clemente will acquire all lands, easements, and rights-of-way as required for project implementation, including a borrow lease from the California State Lands Commission to excavate material from the offshore borrow site as described.

The Federal Government will complete the PED phase and conduct pre-project monitoring to assess the state of the environmental resources in the study area. The Federal government will perform biological resources monitoring for two years prior to initial construction to determine the extent of the T-Street Reef and thus potential impacts from construction. The Federal government will contract the appropriate hopper dredging company to perform initial construction. Per Appendix B of the EIS Volume II titled "Biological Resources Monitoring Program," the Federal government will then monitor the impacts of the placed sand on the biological resources for two years following initial construction. The primary resources monitored will include surfgrass and rocky reef habitat. If significant impacts to these biological resources are observed, renourishment events would be modified to avoid or minimize impacts to the extent practicable and project mitigation would be implemented.

5.5 Operation, Maintenance, Repair, Rehabilitation, and Replacement (OMRR&R)

There are no OMRR&R activities or costs associated with the project.

5.6 Key Social and Environmental Factors

Key social factors associated with the Plan include impacts on surfing characteristics in the study area. Minimization of surfing impacts did not have great influence on the formulation of alternatives, however, potential impacts were quantified in the Coastal Engineering Appendix. Due to the aerial extent and equilibration processes inherent in the NED Plan, minimal impacts on wave refracting and breaking characteristics are expected in the study area.

Key environmental factors included impacts on the T-Street Reef and associated biological resources. As explained above, a detailed monitoring and mitigation plan has been prepared. Impacts are expected to be negligible, however, mitigation will involve restoration of rock reef and surfgrass habitats in amounts equal to those negatively affected. Reef habitat shall be constructed in shallow to deep water based on actual surfgrass impacts. The area of surfgrass loss will be mitigated with an equal area of shallow water reef; the area of reef without surfgrass will be mitigated as deep water reef. Shallow water reef would be constructed on the offshore/outer edge of the existing reef; deep water reef would be constructed at approximately 30 foot water depth.

5.7 Stakeholder Perspectives and Differences

Appendix F of the EIS Volume II is titled "Agency Coordination and Public Involvement" and contains correspondence and meeting minutes from six Resource Agency Coordination Meetings held since 2007. Additional meetings have been held since the last documented meeting in April 2010. The intent of the meetings has been to gain acceptance and support from NOAA NMFS, FWS, EPA, and CA Dept. of Fish & Game regarding the NED Plan, its impacts on environmental resources, and steps the project will take to mitigate for potential impacts. Extensive coordination was conducted with the regulatory resources agencies early in the NEPA/ CEQA process and more intently to develop and refine the Monitoring and Mitigation

Plan mentioned above. Coordination also took place with Corps ERDC Submerged Aquatic Vegetation Restoration Research Program.

Public review of the Draft EIS was held from August 19 to September 23, 2010. Roughly 100 comments were received and all addressed by the Federal government by March 2011. The primary concerns of stakeholders included the need of placing sand on the beach, impacts on water quality, impacts on environmental resources, and impacts on surfing characteristics.

5.8 Environmental Compliance

The NEPA document prepared is an Environmental Impact Statement, which is in final draft form and has undergone required 45-day public review. The EIS will undergo HQ USACE and State & Agency Review before becoming final. The Record of Decision (ROD) has not been finalized.

5.9 State and Agency Review

State and Agency review has not been performed and will be done after recommendation is received from the CWRB.

5.10 Certification of Peer and Legal Review

The Cost Engineering Certification was received from the Cost Engineering DX (Walla Walla District) on February 9, 2011. The Cost Engineering DX prepared the required Cost and Schedule Risk Analysis Report as well.

Legal Certification of the final draft feasibility report was received on April 1, 2011.

Agency Technical Review Certification of the final draft feasibility report was received on April 4, 2011.

Independent External Peer Review of the draft feasibility report was successfully closed out on October 20, 2010.

5.11 Policy Compliance Review

Policy compliance reviews have been conducted to date for the Feasibility Scoping Meeting (FSM), Alternative Formulation Briefing (AFB), and Draft Report milestones.

The FSM equivalent (F-3) meeting was held on 1 December 2004; however there was no Headquarters involvement. A Memorandum for the Record (MFR) was issued on 8 March 2005 documenting the discussions that were conducted for the FSM.

In response to the FSM MFR and continued study efforts, CESPL prepared the Draft AFB Report and Environmental Impact Statement (EIS), dated January/February 2010, for the purpose of conducting an AFB. The HQUSACE staff conducted a policy review of the AFB submittal and provided comments on 22 March 2010. District Responses were provided on 24 March 2010 and the AFB was held on 26 March 2010. The AFB PGM was issued on 11 May 2010.

In response to the AFB PGM, CESPL prepared the Draft Feasibility Report and EIS, dated July 2010 for the purpose of conducting a Feasibility Review Conference. The HQUSACE staff conducted a policy review of the Draft Report submittal and provided comments on 30 September 2010. The FRC was held on 17 November 2010 and the Project Guidance Memorandum was issued on 30 November 2010.