Proposed Mitigated Negative Declaration
for the
Seal Beach National Wildlife
Thin-layer Salt Marsh Sediment Augmentation Pilot Project

Date Issued: August 8, 2014

Lead Agencies:

California State Coastal Conservancy (CEQA Lead Agency)
1330 Broadway, 13th Floor, Oakland, CA 94612
Contact Person: Evyan Borgnis, Project Manager (510-286-4091)

U.S. Fish and Wildlife Service (NEPA Lead Agency)
San Diego National Wildlife Refuge Complex
P.O. Box 2358, Chula Vista, CA 91912
Contact Person: Kirk Gilligan, Refuge Manager (562-598-1024)

Project Summary: The purpose of this draft Mitigated Negative Declaration and accompanying Initial Study/Environmental Assessment (MND/EA) is to describe and analyze the environmental effects of the Seal Beach National Wildlife Refuge – Thin-layer Salt Marsh Sediment Augmentation Pilot Project. The U.S. Fish and Wildlife Service (Service or USFWS) proposes to apply a thin-layer of sediment over approximately 10 acres of existing salt marsh habitat on the Seal Beach National Wildlife Refuge (NWR or Refuge) to document the overall effectiveness of this adaptation strategy in conserving salt marsh habitat threatened by sea level rise along the California coast, while also improving habitat quality within cordgrass (*Spartina foliosa*)-dominated salt marsh habitat to support the endangered light-footed clapper rail (*Rallus longirostris levipes*). The Service will also monitor for a period of five years the physical and ecological responses of the marsh to the sediment augmentation. The results and lessons learned from this pilot project will be shared with Federal, State, and local regulatory and resource agencies, land managers, and other stakeholders to assist in further developing sea level rise adaptation strategies for coastal California.

Under the proposed action, the elevation of an area of coastal salt marsh within the Seal Beach NWR would be raised through the application of a thin-layer (approximately 6 to 10 inches [15 to 25 centimeters]) of appropriate sediment over approximately 10 acres of marsh plain. The project site is located within a 565-acre tidal salt marsh protected within the boundaries of the 965-acre Seal Beach NWR. The majority of the Refuge is located within the boundaries of Naval Weapons Station Seal Beach.

The project is subject to both the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). CEQA applies because the California State Coastal Conservancy (Conservancy), a State agency, has been asked to grant funds for the project, and NEPA applies because U.S. Fish and Wildlife Service (Service), a Federal agency, will implement the project, and the U.S. Navy, also a Federal agency, owns a portion of the project site.

This MND/EA has been prepared in accordance with CEQA (Public Resources Code 21000 et seq.) and the CEQA Guidelines, (California Code of Regulations Title 14, section 15000 et seq.), and NEPA (42 USC 4341 et seq.) and the Council on Environmental Quality (CEQ) NEPA Regulations contained in C.F.R. Parts 1500-1508. The lead agency under CEQA is the Conservancy and the lead agency under NEPA is the Service. The Conservancy and the Service have agreed to prepare a joint CEQA/NEPA document that complies with the administrative regulations set forth in the CEQA Guidelines and the CEQ NEPA Regulations. The analysis provided in this MND/EA will aid the Conservancy, Santa Ana Regional Water Quality Control Board, Service, U.S. Navy, and U.S. Army Corps of Engineers in their decision-making process.

Proposed Actions:

- California State Coastal Conservancy - Approval of Grant Funds
- U.S. Fish and Wildlife Service - Implementation of the Project
- U.S. Navy – Concurrence on Project Implementation
- U.S. Army Corps of Engineers - Section 404 Nationwide Permit 27
- Regional Water Quality Control Board - 401 Certification
- California Coastal Commission - Coastal Consistency Determination

Project Description: See Attachment A.

Effected Environment: See Attachment A.

Project Location: Seal Beach National Wildlife Refuge, Orange County, California.

Proposed CEQA Finding:

Findings of Significant Effect on the Environment:
Based on the analysis and conclusions presented in the joint NEPA/CEQA Initial Study/EA, the Conservancy finds that the proposed project will not have a significant effect on the environment, and that although the proposed project has the potential for a significant effect on the environment in the areas of water quality, biological resources, and cultural resources, measures have been incorporated into the project design to mitigate the identified effects to below a level of significance. Therefore, a Mitigated Negative Declaration has been prepared.

Documentation: The Initial Study and Environmental Assessment (IS/EA), provided as Attachment A, documents the reasons to support the above CEQA Finding.

Mitigation Measures: The measures presented here have been incorporated into the project design to mitigate potential impacts to below a level of significance. The Service will be responsible for ensuring that these measures are implemented as described.

Mitigation Measure BIO-1: If, within five years of sediment application, reestablishment of the native salt marsh vegetation community to a density and percent cover similar to that present within the project site prior to sediment application has not occurred, the Refuge shall develop and implement a restoration plan to reestablish native salt marsh vegetation at densities and a percent cover similar to pre-project site conditions. Site management and monitoring shall continue until salt marsh vegetation has been restored to the site in accordance with the specifications of the restoration plan.

Mitigation Measure BIO-2: A qualified biologist shall be on site during construction activities to monitor for the presence of wildlife and sensitive species in particular. The biologist shall have the authority to halt construction when wildlife is observed within or near the sediment application site. Work crews will be briefed on how to identify sea turtles and marine mammals that are expected to occur within and around the pilot project area. The biological monitor will prepare incident reports of any observed sea turtle activity and shall provide such reports to NMFS within 24 hours of an observation. Any work vessels (e.g., containment barge, workboat) moving about the project site, including from the dredge site and within the adjacent tidal channels, shall comply with a five-mile per hour (mph) speed limit. In the event of a collision between the containment barge or workboat and a marine mammal or sea turtle, the Service shall immediately contact the NMFS Southwest Regional Office's Stranding Coordinator, and submit a report to the NMFS within 24 hours. To reduce the potential for sea turtles to be present in the area during project implementation, sediment transport and application within the Refuge shall only occur within the timeframe of November 1 to February 15, when water temperatures are generally lower than other times of the year.

Mitigation Measure BIO-3: Eelgrass surveys shall be conducted within the tidal channels that abut the 16-acre pilot project site and at an appropriate reference site no more than 120 days before proposed sediment application, and again after sediment application is completed. If habitat impacts associated with the project are identified, compliance with the SCEMP shall be initiated and yearly monitoring reports shall be filed with resource agencies and the California Coastal Commission.

Mitigation Measure BIO-4: To avoid the presence of light-footed clapper rails in the vicinity of the project during sediment application, prior to sediment application, the three artificial light-footed clapper rail nesting platforms located within and adjacent to the project site shall be temporarily removed after the end of the 2014 breeding season (after September 15). In addition, prior to the daily application of sediment onto the pilot project site, a qualified biologist shall survey the 16-acre site and surrounding areas for the presence of rails. If any are present, an air horn or cracker shells will be deployed to move the birds off the site prior to sediment application. If noise proves ineffective, physical presence may be used to haze birds to move to the other parts of the Refuge. Also, monitoring shall continue throughout the day to discourage clapper rails from moving into the project site, particularly

during periods when sediment is not being sprayed, such as during breaks or when adjustments in the application process are being implemented. If sediment is applied using the "rainbow" method of spraying in the air as opposed to spreading the slurried material on the ground from a pipe, efforts shall be made to haze (through noise or physical presence) other avian species out of the impact area prior to each application interval.

Mitigation Measure CR-1: In the event that cultural resources are discovered during any disturbance to subsurface material on the 16-acre pilot project site, the ground disturbing activity shall be halted, the Service's Regional Archaeologist shall be notified, and additional consultation shall be initiated to ensure compliance with the NHPA and other applicable Federal regulations and policies.

Mitigation Measure WQ-1: Prior to initiation of sediment transport and application to the pilot project site, the Service shall submit an application to the Santa Ana Regional Water Quality Control Board for coverage under a 401 Certification. The Service shall implement all conditions included in the 401 Certification, including the implementation of measures to reduce potential increases in sedimentation, turbidity, and other impacts associated with the transport and beneficial use of dredge material for habitat enhancement.

Mitigation Measure WQ-2: To reduce the potential for sediment to enter adjacent waterways, best management practices (BMPs) shall be implemented throughout the pilot project's sediment transport and application process. BMPs shall include providing approximately six acres of vegetated buffer around the application site; periodic inspection of sediment pipelines; and monitoring for excessive turbidity in the vicinity of the transport pipeline or containment barge and associated sediment distribution apparatus (e.g., rainbow sprayer, open pipe, end-of-pipe baffle impingement). If a substantial leak is identified in a pipeline carrying sediment, the affected pipeline segment shall be immediately repaired or replaced, or a silt curtain or similar measure shall be employed to capture and retain sediment at the source of the leak. Monitoring of sediment movement and turbidity levels shall also occur during sediment application, and application methods shall be adaptively managed to ensure that movement of sediment off the site is minimized. Measures such as installation of silt fencing or a silt curtain shall be installed if proposed vegetative buffers around the site cannot adequately maintain the sediment within the project boundary.

Comment Due Date: This document will be available for public comment for a period of 30 calendar days. All comments must be provided in writing to Evyan Borgnis, Conservancy Project Manager, (via mail to California State Coastal Conservancy, 1330 Broadway, 13th Floor, Oakland, CA 94612, via email to eborgnis@scc.ca.gov, or via fax to 510-286-1883) no later than 5:00 PM PDT on **Monday, September 8, 2014**. Questions regarding this document or the proposed project can be directed to Evyan Borgnis, Conservancy Project Manager, at 510-286-4091, or Kirk Gilligan, Refuge Manager, at 562-598-1024 or Kirk_Gilligan@fws.gov.

Distribution List: This draft MND/EA has been provided to following agencies, organizations, and other interested parties for review and comment.

Local Libraries
Seal Beach Mary Wilson Public Library

U.S. Congress
Honorable Barbara Boxer, U.S. Senate
Honorable Dianne Feinstein, U.S. Senate
Congressman Dana Rohrabacher, 48th District

California State Legislature
State Senator Lou Correa, 34th District
State Assemblyman Travis Allen, 72nd District

Tribes
Cahuilla Band of Indians
Gabrieleno/Tongva Indians of California
Juaneno Band of Mission Indians

City Governments
City of Seal Beach, Director of Community Development
City of Seal Beach, Mayor and City Council
City of Huntington Beach, City Manager

County Government
County of Orange Supervisor Moorlach
County of Orange, Parks
County of Orange, Public Works (Watersheds)
County of Orange, Vector Control

Federal Agencies
Naval Weapons Station, Seal Beach
NOAA Marine Fisheries
U.S. Army, Corps of Engineers
U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office
Environmental Protection Agency, Region 9

California State Agencies
California Coastal Commission, Federal Consistency
California State Clearinghouse
California State Parks, State Historic Preservation Officer
Department of Fish and Wildlife
State Lands Commission, Executive Officer
Santa Ana Regional Water Quality Control Board
Coastal Sediment Management Workgroup

Organizations
California Native Plant Society
Center for Biodiversity
El Dorado Audubon
Endangered Habitats League
Friends of Seal Beach NWR
Sea and Sage Audubon
Southern California Wetlands Recovery Project
Southwest Wetlands Interpretive Association
Surfrider Foundation

Media
Huntington Beach News
Los Angeles Times
Orange County Register
Seal Beach Sun

Copies of the draft Mitigated Negative Declaration, IS/EA, and Initial Study Checklist are available for review at the following location:

Seal Beach / Mary Wilson Library
707 Electric Avenue, Seal Beach, CA 90740
Call 562-431-3584 for library hours

These documents can also be viewed electronically at the following websites:

California Coastal Conservancy Website, go to: www.scc.ca.gov, then click Public Notices under the Quick Links box in the upper left hand corner of the home page.

Seal Beach National Wildlife Refuge Website, go to: www.fws.gov/refuge/Seal_Beach/what_we_do/resource_management.html

A Compact Disk (CD) containing the proposed Mitigated Negative Declaration, IS/EA, and Initial Study Checklist can also be obtained by contacting Victoria Touchstone, USFWS, at Victoria_Touchstone@fws.gov or 619-476-9150 extension 103.

Evyan Borgnis, Project Manager
California Coastal Conservancy

07/31/14
Date of Draft

DRAFT INITIAL STUDY/ENVIRONMENTAL ASSESSMENT

Seal Beach National Wildlife Refuge
Thin-layer Salt Marsh Sediment Augmentation Pilot Project
(Orange County, California)

Lead CEQA Agency

California State Coastal Conservancy
1330 Broadway, 13th Floor
Oakland, CA 94612-2530

Lead NEPA Agency

U.S. Fish and Wildlife Service
San Diego National Wildlife Refuge Complex
P.O. Box 2358
Chula Vista, CA 91912

August 8, 2014

Table of Contents

1. Introduction 1
Project Summary
Location 2
Background 2
Refuge Planning 2
Beneficial Use of Dredge Material 5

2. Purpose and Need 7
Purpose of the Action 7
Need(s) for the Action 7

3. Decisions to be Made and Applicable Authorities 8

4. Description of Alternatives 9
Alternatives Development 9
No Action 10
Proposed Action 10
Summary 10
Sediment Source 10
Sediment Application on the Refuge 13
Site Preparation 13
Containing Sediments with the Project Site 13
Pre- and Post-Sediment Application Monitoring 14

5. Affected Environment 15

A. Air Quality 16
Regional Setting and Context 16
Sensitive Receptors and Locations 17
Federal Regulatory Setting 17
California Regulatory Setting 18
South Coast Air Quality Management District 19

B. Biological Resources 21
Regional Setting and Context 21
Vegetation 21
Birds 22
Benthic Invertebrates 23
Fisheries 25
Essential Fish Habitat 28
Endangered and Threatened Species and Other Species of Concern 29

C. Cultural Resources 36

D. Greenhouse Gas Emissions 36
Federal Regulatory Setting 37
California Regulatory Setting 37
Local Regulatory Setting 38

E. Hazards and Hazardous Materials 39
Sediment Characterization 40

F. Water Quality 43

G. Noise 43

6. Environmental Consequences 44

A. Air Quality 44
Impact Analysis for the Proposed Action 44
Compatibility with Applicable Air Quality Plan 46
Consistency with Adopted Air Quality Standards 46
Exposure to Sensitive Receptors 46
Objectionable Odors 47
Impact Analysis for the No Action Alternative 47
Compatibility with Applicable Air Quality Plan 47
Consistency with Adopted Air Quality Standards 47
Exposure to Sensitive Receptors 47
Objectionable Odors 47

B. Biological Resources 47
Impact Analysis for the Proposed Action 48
Impact Analysis for the No Action Alternative 53

C. Cultural Resources 53
Impact Analysis for the Proposed Action 53
Effects on Significant Historical and/or Archaeological Resources 53
Effects on Unique Paleontological Resources 55
Impact Analysis for the No Action Alternative 55

D. Greenhouse Gas Emissions 55
Impact Analysis for the Proposed Action 56
Generation of GHG Emissions 56
Consistency with Applicable Plans, Policies, or Regulations 57
Impact Analysis for the No Action Alternative 57
Generation of GHG Emissions 57
Consistency with Applicable Plans, Policies, or Regulations 57

E. Hazards and Hazardous Materials 58
Impact Analysis for the Proposed Action 58
Impact Analysis for the No Action Alternative 59

F. Water Quality 58
Impact Analysis for the Proposed Action 59
Sedimentation and Turbidity 59
Chemical Pollutants 60
Impact Analysis for the No Action Alternative 60

G. Noise 60
Impact Analysis for the Proposed Action 61
Impact Analysis for the No Action Alternative 61

7. Cumulative Effects 61
Biological Resources 61
Proposed Action 62
No Action Alternative 62
Cultural Resources 62
Greenhouse Gas Emissions 63
Water Quality 63
Noise 64

8. Direct or Indirect Environmental Effects on Human Beings 64

9. Environmental Justice 64

10. Irretrievable and Irreversible Commitment of Resources 64

11. Short-Term Use of the Environment and Long-Term Productivity 64

12. Energy Requirements and Conservation Potential of Alternatives 64

13. Document Preparation 65

14. Agencies and Persons Consulted 65

15. References Cited 65

List of Figures

Figure 1. Vicinity Map 3

Figure 2. Location Map 4

Figure 3. Location of Main Channel West within the OC Parks Maintenance Dreding Project Site 6

Figure 4. Relationship of the Project Site to the Main Channel West Dredge Area 12

Figure 5. Relationship of the Pilot Project Site to Eelgrass and Artificial Nesting Platforms 14

List of Tables

Table 1. Preliminary Maintenance Dredge Quantities for the Main Channel West Dredge Site . 11

Table 2. Federal and State Ambient Air Quality Standards 18

Table 3. Federal and State Attainment Status for the Orange County Portion of the South Coast Air Basin 19

Table 4. SQAQMD Significance Thresholds for Construction (pounds per day) 20

Table 5. Results of Recent Avian Surveys of the 16-Acre Project Site 23

Table 6. Epibenthic Invertebrates Captured at Survey Area A3 during the 2013 Anaheim Bay Benthic and Fish Community Assessments 24

Table 7. Fish Species Collected in Survey Area A3 during the 2013 Anaheim Bay Benthic and Fish Community Assessments 26

Table 8. Number of Light-footed Clapper Rail Breeding Pairs at Seal Beach NWR, 1980-2012 32

Table 9. Birds of Conservation Concern and California Special Status Species with the Potential to Occur on or near the Pilot Project Site 35

Table 10. Summary of Installation Restoration Program Sites on Naval Weapons Station Seal Beach 41

Table 11. Comparison of Grain Size Data for Main Channel West and the Seal Beach NWR Site 42

Table 12. Estimate of Unmitigated Regional Construction Emissions Associated with the Implementation of the Pilot Project 45

Table 13. Estimate of Unmitigated Regional Construction Emissions over the Duration of the Sediment Augmentation Project 46

Table 14. Estimate of GHG Emissions Associated with the Proposed Pilot Project 56

Attachment A
Initial Study and Environmental Assessment

1. Introduction

The California State Coastal Conservancy (Conservancy), as the lead agency under the California Environmental Quality Act (CEQA), and the U.S. Fish and Wildlife Service (Service or USFWS), as the lead agency under the National Environmental Policy Act (NEPA) of 1969 (42 USC 4341 et seq.), have jointly prepared this Initial Study/Environmental Assessment (IS/EA). The purpose of this document is to evaluate the potential effects to the environment of implementing a pilot project for sea level rise adaptation on approximately 10 acres of existing coastal salt marsh habitat on the Seal Beach National Wildlife Refuge (NWR) in Orange County, California. Compliance with CEQA is required because the Conservancy has been asked to grant funding for the project, while compliance with NEPA is required because the Service, a Federal agency, proposes to take action on Federal lands.

This IS/EA has been prepared in accordance with CEQA (Public Resources Code Section 21000, et seq.), the State CEQA Guidelines [California Code of Regulations Section 15000, et seq.], NEPA, and the Council on Environmental Quality NEPA Regulations contained in C.F.R. Parts 1500-1508. This document describes the purpose and need for the proposed action (i.e., the project); presents a description of the proposed action and the alternative action; describes the environmental setting; analyzes the potential environmental impacts of each alternative; and addresses the public involvement process.

The Service will use the IS/EA to determine whether the proposed action has the potential to cause significant environmental effects. It will also be used by the Conservancy to determine whether the finding can be made that there is no substantial evidence in light of the whole record before the agency, that the project as revised to include mitigation measures may have a significant effect on the environment (14 CCR 15070(a)). The analysis provided in this document will also aid the U.S. Navy, U.S. Army Corps of Engineers, and Santa Ana Regional Water Quality Control Board in their decision-making process.

In May 2012, the Service approved the Final Comprehensive Conservation Plan (CCP) for the Seal Beach National Wildlife Refuge (USFWS 2012) and signed a Finding of No Significant Impact based on the analysis provided in the EA prepared for the CCP. The EA analyzed, at the programmatic level, a proposal to apply “a thin layer of sediment” over the existing vegetation “to provide for a slight increase in the elevation of the marsh plain, while still enabling the vegetation to grow up through the added sediment. Part of this strategy will include pre- and post-sediment application monitoring . . .” (USFWS 2012). The proposed pilot project is consistent with the recommendations presented in the Seal Beach NWR CCP and will implement one of the strategies identified in the CCP for achieving Refuge goals and objectives as they relate to the recovery and protection of the light-footed clapper rail (*Rallus longirostris levipes*). The analysis in the current IS/EA tiers from the analysis related to this proposal in the programmatic level EA for the Seal Beach NWR CCP, and as such, the EA prepared for the CCP

is incorporated by reference into this document. The programmatic EA can be review online at http://www.fws.gov/refuge/Seal_Beach/what_we_do/planning.html.

Project Summary

The Service proposes to implement a pilot project for a sea level rise adaptation strategy on a portion of coastal salt marsh within the Seal Beach NWR. The pilot project consists of the application of a thin-layer of clean sediment of appropriate grain size to a portion of the marsh plain within the Refuge, followed by five years of annual monitoring of the physical and ecological responses of the salt marsh ecosystem to sediment application.

Raising the elevation of the salt marsh plain within the Seal Beach NWR is proposed to address the adverse effects of subsidence and sea level rise on the habitat quality of coastal salt marsh, particularly cordgrass (*Spartina foliosa*)-dominated salt marsh habitat, and to improve habitat quality for the federally and State listed endangered light-footed clapper rail. It is also the intent of this project to disseminate the results of the comprehensive monitoring program to interested Federal, State, and local agencies, coastal land managers, and other stakeholders to assist in further developing sea level rise adaptation strategies for coastal California. The specific details of the proposed action are presented in Section 4 (Description of Alternatives).

Location

The pilot project site is located within the Seal Beach NWR in northwestern Orange County, California (Figure 1). Managed by the Service as part of the National Wildlife Refuge System, the majority of the Seal Beach NWR lies within the boundaries of Naval Weapons Station Seal Beach. As shown in Figure 2, the 16-acre pilot project site includes property owned by the U.S. Navy, as well as sovereign land held by the California State Lands Commission for the benefit of the people of California and leased to the Service for management as a National Wildlife Refuge.

Background

Refuge Planning. The current proposal to raise the elevation of the marsh plain was initially suggested during the planning effort for the Seal Beach NWR Comprehensive Conservation Plan (CCP) (USFWS 2012). The CCP describes the desired future conditions of the Refuge and provides direction for how the Refuge should be managed to best achieve Refuge purposes and goals. In the case of the Seal Beach NWR, the Refuge was established to preserve and manage the habitat necessary for the perpetuation of two endangered species – the light-footed clapper rail and California least tern (*Sternula antillarum browni*), as well as to preserve habitat to support migratory waterfowl, shorebirds, and other water birds.

During the issues identification process for the CCP planning effort, the short stature of the cordgrass and the existing elevations of the marsh plain were identified as the primary factors limiting natural clapper rail nesting on the Refuge. Although cordgrass is quite abundant on the Seal Beach NWR and cordgrass density (number of stems) is similar to nearby marshes, the height and cover of the cordgrass on the Refuge is much lower (Massey et al. 1984). The vigor of the cordgrass appears to be compromised by several factors: the diversion of freshwater inputs resulting in increased salinities and a reduction or loss of sediment input (USFWS and U.S. Navy 1991), land subsidence, and sea level rise.

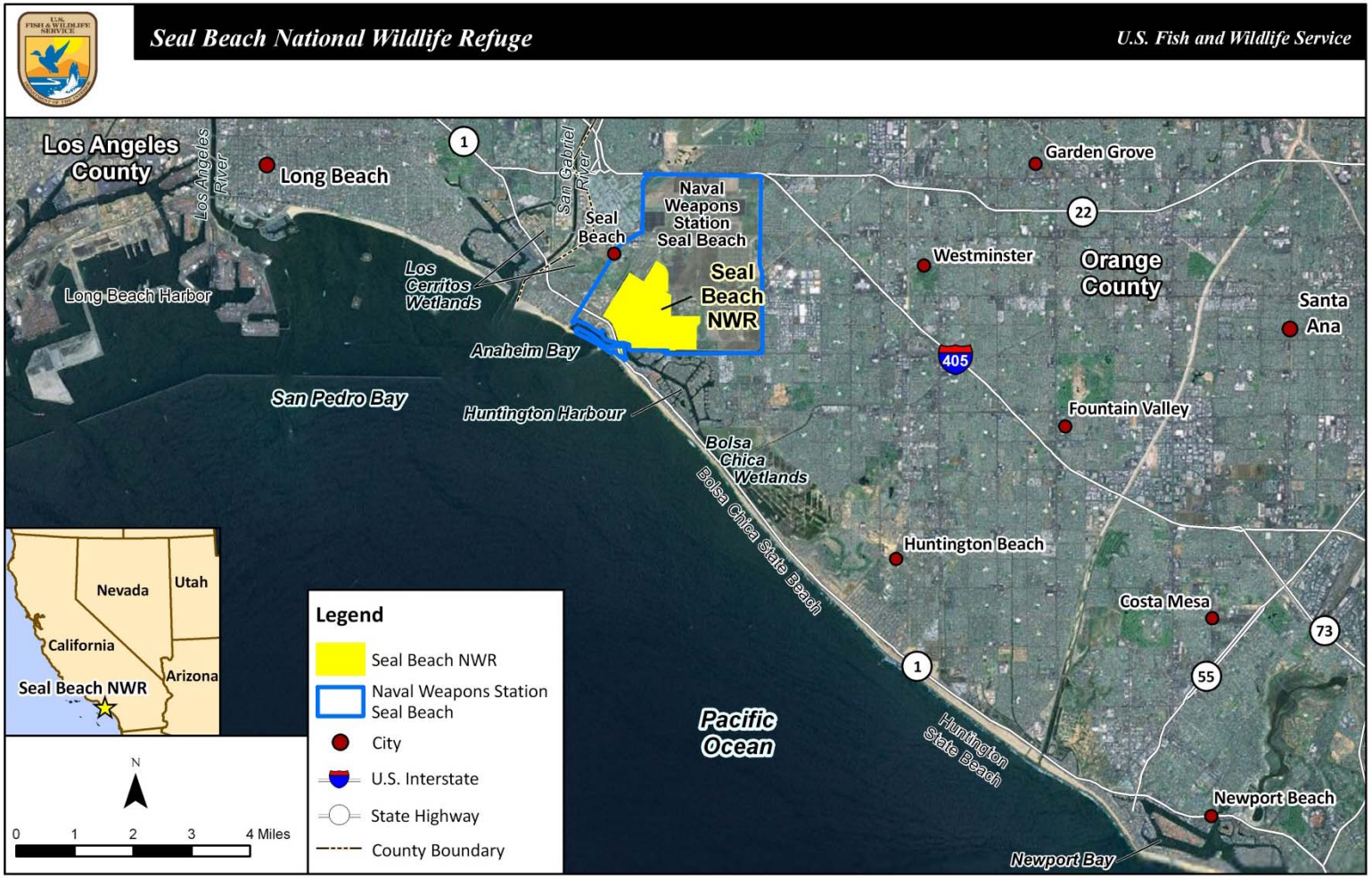

Figure 1. Vicinity Map

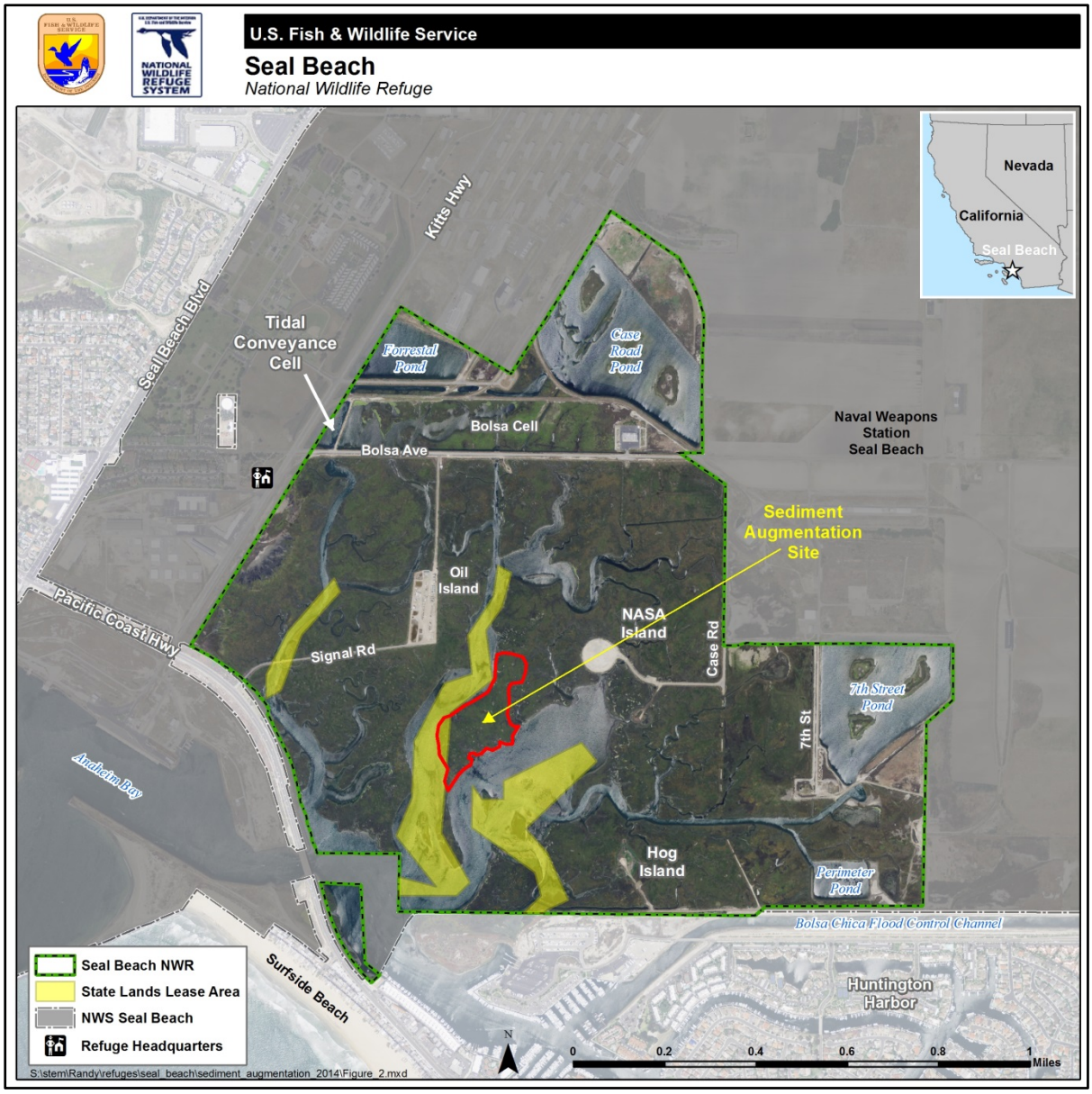

Figure 2. Location of the Pilot Project Site

The lower marsh elevations combined with short cordgrass stem height results in the complete inundation of the cordgrass stands in Anaheim Bay during higher high tides. This situation prevents light-footed clapper rails from constructing natural nests within much of the Refuge's cordgrass-dominated salt marsh habitat. Currently, about 95 artificial nesting platforms are maintained in the marsh to provide the rails with alternative nesting opportunities.

The Final CCP includes various recommendations for improving habitat quality on the Refuge for the light-footed clapper rail, including raising the elevation of the marsh plain by applying a thin-layer over the existing vegetation (USFWS 2012). The proposed pilot project is consistent with the CCP recommendations, and its implementation will assist the Service in achieving Refuge goals and purposes.

Beneficial Use of Dredge Material. In late 2013, the Service became aware of a proposal by the Orange County Department of Parks (OC Parks) to implement maintenance dredging actions within Sunset/Huntington Harbour, a portion of Anaheim Bay located to the south and southwest of the Refuge. The Service approached OC Parks about the potential for using some of the dredge material for beneficial use on the Refuge. OC Parks agreed to provide a portion of their dredged sediments to the Refuge and conducted the necessary sediment characterization work within the area to be dredged. Based on the results of the sediment characterization, clean sediment of appropriate grain size was identified within the areas to be dredged. With the identification of a sediment source, the Service initiated the process of developing a thin-layer sediment augmentation pilot project for a small area of the Seal Beach NWR that includes pre- and post-application monitoring of the project site.

The use of dredge material for this beneficial use is consistent with the recommendations of the National Dredge Team. As stated in the Dredged Material Management Action Agenda for the Next Decade (USEPA 2003), "much of the several hundred million cubic meters of sediment dredged each year from United States ports, harbors, and waterways could be used in a beneficial manner, such as for habitat restoration and creation, beach nourishment, and industrial and commercial development. Yet most of this dredged material is instead disposed in open water, confined disposal facilities, and upland disposal facilities. . . Beneficial use must become a priority at all levels of management, funding must be increased for beneficial use projects and research, planning must be proactive, and there must be a recognition that dredged material is a valuable resource."

All aspects of the maintenance dredging project within Sunset/Huntington Harbour will be implemented by OC Parks, with maintenance dredging scheduled to occur regardless of whether or not the proposed pilot project is implemented on the Seal Beach NWR. OC Parks and the City of Huntington Beach have prepared the Sunset/Huntington Harbour Maintenance Dredging and Waterline Installation Project Draft Initial Study/Mitigated Negative Declaration IP 14-148, dated August 2014 (OC Parks IS/MND) to address the potential environmental effects of several actions including dredging for navigational purposes (maintenance dredging) within Sunset/Huntington Harbour. The sediment that will be provided to the Refuge from this maintenance dredging project will come from the Main Channel West dredging area, as indicated in Figure 3.

Transport of sediment from the Main Channel West dredge site to the Refuge project site, application of the material onto the site, and pre- and post-application monitoring are addressed in this IS/EA. Analyses and conclusions of the OC Parks IS/MND that are relevant to this pilot project are summarized throughout this document. Copies of the OC Parks IS/MND are available for review upon request (see the contact information provided on the cover page of this document.

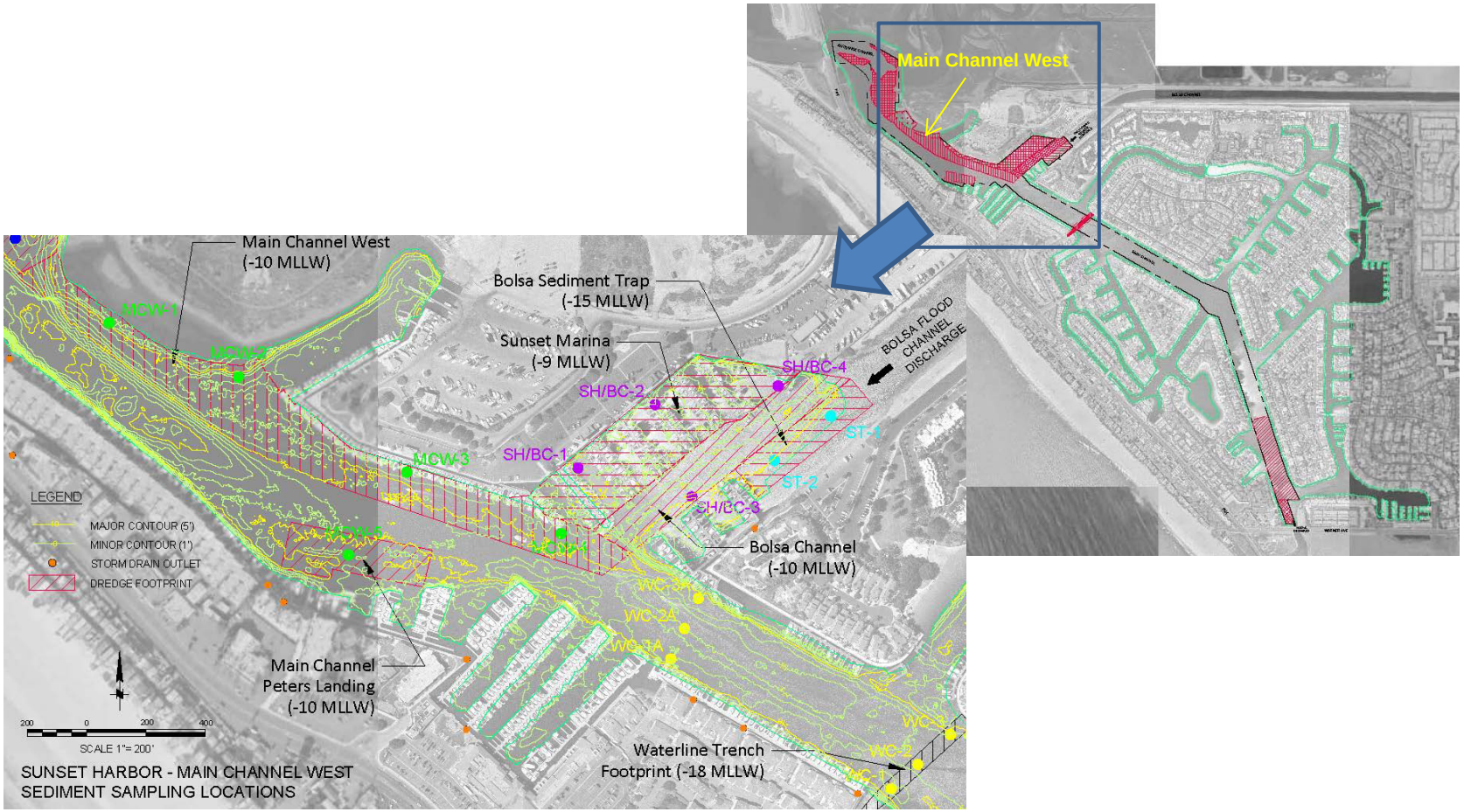

Figure 3. Location of Main Channel West within the OC Parks Maintenance Dredging Project Site

2. Purpose and Need

Purpose of the Action

The purpose of this action is to improve habitat conditions for the federally listed endangered light-footed clapper rail consistent with the goals and objectives of the Seal Beach NWR CCP (USFWS 2012), as well as to evaluate the effectiveness of thin-layer sediment augmentation as an adaptation strategy for addressing sea level rise in coastal salt marsh habitats in California, particularly in those salt marshes where there will be no opportunity for inland migration.

Specific project objectives include:

- Two years after applying sediment to the pilot project site, achieve/maintain a minimum 3-inch increase in the marsh plain elevation over pre-application elevations throughout the 10-acre application area.
- Within two years of sediment augmentation, achieve cordgrass stem lengths equivalent to pre-application conditions and achieve terminal cordgrass elevations higher than pre-application conditions throughout the application area.
- Within two years of sediment augmentation, achieve a diversity and abundance of native vegetation and benthic invertebrates that is similar to the pre-application conditions on the application site.
- Within one year of sediment augmentation, provide foraging opportunities for migratory birds and within two years provide foraging and nesting opportunities for light-footed clapper rails within the 10-acre application area.

Following completion of pre- and post-application monitoring, compile and disseminate the monitoring results and lessons learned from the pilot project to the resource and regulatory agencies and interested land managers

Need(s) for the Action

A pilot project is needed to determine whether thin-layer sediment augmentation is an effective tool to address the adverse effects of subsidence and sea level rise on habitat quality within the cordgrass-dominated salt marsh habitat on the Seal Beach NWR. Identifying measures to improve habitat quality within the Refuge is of particular interest to the Service because recent investigations by the U.S. Geological Survey (USGS) and researchers at the University of California, Los Angeles (UCLA) indicate that the salt marsh habitat within the Seal Beach NWR has the lowest mean elevation and mean elevation relative to mean high water (MHW) of the eight California marshes where survey-grade elevation surveys were conducted (Takekawa et al. 2013a).

Results of a study conducted by USGS in 2013 (Takekawa et al. 2013b) to determine the amount of subsurface subsidence occurring in and around the marsh since the last extensive subsidence survey was conducted in 1994 indicate that subsidence on the Seal Beach NWR is occurring at a rate of -4.13 mm/yr. (SE + 1.21 mm/yr.). With this data, USGS determined that the Refuge is experiencing a relative sea-level rise rate three times greater (6.23 mm/yr.) than that of similar southern California marshes not experiencing subsidence (Takekawa et al. 2013b).

Implementing the proposed pilot project, will provide valuable information regarding the effectiveness of thin-layer sediment augmentation as a sea-level rise adaptation strategy and could expand the ways in which dredge material might be used for beneficial use.

Similar to other U.S. west coast salt marsh ecosystems surrounded by urban development, the Seal Beach NWR is particularly vulnerable to the effects of climate change, including sea level rise. Addressing this vulnerability in California will require the implementation of a range of tools at various scales to ensure coastal wetland resilience to sea-level rise. Depending upon the site, these tools can include:

- protecting large areas that represent a range of habitat types to ensure biological connection and biodiversity, as well as an array of ecological functions;
- providing adequate open space adjacent to existing coastal wetlands to accommodate inland migration of salt marsh as sea levels rise; and
- increasing the elevation of the marsh plain to keep pace with sea-level rise.

At the Seal Beach NWR, the majority of what remains of the historical Anaheim Bay marsh complex is protected within the refuge boundaries. There are no other adjacent wetland areas available for protection. Although there is some room for migration of wetlands to the east and north of the marsh complex, these lands are located outside of the Refuge boundary on Navy lands. As a result, the only tool currently identified for addressing the effects of rising sea levels on the Refuge is increasing the elevation of the marsh plain. Thin-layer sediment augmentation has proved to be an effective tool on the Gulf and East coasts of the U.S. This approach has yet to be tested on the West coast, but based on the documented successes of this method outside of California (Ray 2007); it would appear prudent to evaluate its effectiveness along the coast of California.

3. Decisions to be Made and Applicable Authorities

A variety of decisions, approvals, and permits must be obtained to implement that proposed action, including:

- State Coastal Conservancy – Adoption of the Final Mitigated Negative Declaration and decision to grant funds
- U.S. Fish and Wildlife Service – Approval of a Finding of No Significant Impact and compliance with Section 7 of the Endangered Species Act (ESA)
- U.S. Department of the Navy – Agreement to implement the project on Navy land
- NOAA - ESA Section 7 compliance and consultation under the Magnuson-Stevens Fishery Conservation and Management Act for federal permitting and funding activities that could adversely affect Essential Fish Habitat
- U.S. Army Corps of Engineers - Issuance of a Nationwide 27 Permit
- Santa Ana Regional Water Quality Control Board - Issuance of a 401 Water Quality Certification
- California Coastal Commission - Coastal Consistency Determination

For the Federal Agencies utilizing this document to assist their decision making process, the following authorities apply to the proposed action:

- Coastal Zone Management Act of 1972, as amended
- National Wildlife Refuge Administration Act, as amended (16 U.S.C. 668 dd et seq.).
- National Wildlife Refuge System Improvement Act of 1997 (P.L. 105-57)
- National Environmental Policy Act of 1969 (NEPA) (P.L. 99-160)
- Endangered Species Act of 1973 (16 USC 1531 et seq.)
- National Historic Preservation Act of 1966, as amended (16 USC 470 et seq.)
- Archaeological and Historic Preservation Act of 1974
- Clean Air Act, as amended (42 USC 7401 et seq.)
- Federal Water Pollution Act of 1948, as amended (33 USC 1251 – 1376; Chapter 758; P.L. 845, 62 Stat. 1155) (Clean Water Act)
- Rivers and Harbors Act of 1899
- Fish and Wildlife Coordination Act of 1932, as amended
- Migratory Bird Treaty Act, as amended (16 USC 703 et seq.)
- Executive Order 12898, 11 February 1994, Environmental Justice

4. Description of Alternatives

Alternative Development

The Council on Environmental Quality regulations implementing NEPA (section 1508.9 (b)), say that an EA must briefly describe alternatives to the proposed action, as required by Section 102(2)(E) of NEPA. Section 102(2)E of NEPA requires Federal agencies to study, develop, and describe appropriate alternatives to recommended courses of action in any proposal that involves unresolved conflicts concerning alternative uses of available resources. In general, the Federal agency preparing an EA should develop a range of alternatives that could reasonably achieve the need that the proposed action is intended to address.

In this EA, the range of alternatives is narrow because, the purpose and need for the proposed action is very limited in scope. In developing a range of alternatives to the proposed action, the Service looked at what, if any, other sources of material might be available for use at the site, as well as what other locations within the Refuge might be considered. The only source of clean material of appropriate grain size that has been identified for this project to date is material that would be generated by a planned dredging project in the immediate vicinity of the Refuge. There are likely other potential sources of dredge material along the Los Angeles/Orange County coast, although none has been identified. The costs associated with transporting the sediments from a distant site to the Refuge would be high, and could affect the feasibility of the effort.

The following criteria were used in selecting the pilot project site: the site is included within the area designated for marsh enhancement in the Seal Beach NWR CCP (USFWS 2012); the site is situated in one of the lowest areas of the Refuge; the site consists primarily of vegetated marsh plain with limited tidal creeks; and the site is easily accessible from a barge or boat. Resource values for sites within the Refuge that meet the site selection criteria are fairly similar which means that identifying an alternative location for implementing this project would not result in

sufficient differences in impact evaluation to warrant the inclusion of such an alternative. Therefore, the Service has concluded that the no action and proposed action represent a reasonable range of alternatives.

No Action

The no action alternative can include not distributing funding, not providing approval, and/or not implementing an action (Council on Environmental Quality, 40 Most Asked Questions, Question 3). The no action alternative provides a description of what would happen if no action is taken, and serves as the baseline from which the action alternative will be evaluated.

Under the no action alternative, no sediment augmentation would occur on the Seal Beach NWR. The effects of subsidence and sea-level rise on the existing habitat and affected species, including the light-footed clapper rail, would continue. The dredge material from the OC Parks' maintenance dredging project that would have been used for sediment augmentation on the Refuge would be disposed of in one of several methods (as addressed in the OC Parks IS/MND) including disposal at U.S. Environmental Protection Agency (USEPA)-approved LA-2 open ocean site, reused at eelgrass mitigation sites within the Harbour or elsewhere, or as upland fill at an upland landfill site or port confined disposal site.

Proposed Action

Summary. Under this alternative, the Service proposes to implement a pilot project to evaluate the effectiveness of thin-layer sediment augmentation as an adaptation strategy for addressing the adverse effects of sea level rise and subsidence on coastal salt marsh habitat. In order to conduct this research over a manageable area and within a reasonable budget, the pilot project is proposed for approximately10 acres of a 16-acre site situated within the Refuge's 565-acre intertidal salt marsh habitat. As indicated in Figure 2, the project site is located within the south central portion of the Refuge, to the southwest of NASA Island between two major tidal channels that extend well into the marsh from Anaheim Bay. The 16-acre site includes property owned by the U.S. Navy, as well as sovereign land held by the California State Lands Commission for the benefit of the people of California and leased to the Service for management as a National Wildlife Refuge.

The pilot project involves two major components: the application of approximately 10,000 to 13,500 cubic yards [CY] of clean dredge material of appropriate grain-size over approximately 10 acres of the 16-acre site, and pre- and post-sediment application monitoring. Revegetation of the 10-acre site is expected to occur over a period of approximately two to five years and will involve regrowth of existing vegetation through the new sediment layer, as well as natural recruitment from nearby seed sources.

Sediment Source. Sediment for this project will be provided by OC Parks in association with their Sunset/Huntington Harbour Maintenance Dredging Project. Specifically, OC Parks has agreed to provide for beneficial use, a portion of the sediment to be dredged from the Main Channel West segment of the larger maintenance dredging project. As described in the OC Parks IS/MND, the maintenance dredging project will occur entirely within the Sunset Aquatic Marina area and the main channel of the Harbour between the bridge over the Pacific Coast Highway and Warner Avenue.

OC Parks proposes maintenance dredging within five locations of the main channel of the Harbour, including the Main Channel West area (refer to Figure 3), to improve boat navigation. The decision to use material from the Main Channel West dredge site for sediment augmentation on the Refuge was made by the Service and Navy, based on the results of the sediment chemical and grain size analyses (Kinnetic Laboratories, Inc. and Moffatt & Nichol 2014) conducted at the proposed dredge site and the Refuge's receiving site.

The total maximum amount of dredged materials associated with OC Parks' maintenance dredging activities is estimated to be 265,000 CY. Of that, the maximum amount of dredge material for the Main Channel West site is 41,770 CY, and of that total, 10,000 to 13,500 CY will be transported from the dredge site for beneficial use on the pilot project site. Dredge depths and volumes with and without the overdredge amounts for the Main Channel West segment of the maintenance dredging project are provided Table 1. Table 1 also provides the square-footage of the footprint at the Main Channel West dredge site (OC Parks IS/MND). Figure 4 illustrates the proximity of the pilot project site to the Main Channel West dredge site.

Table 1
Preliminary Maintenance Dredge Quantities for the Main Channel West Dredge Site

Dredge Site	Dredge Design Depth (feet, MLLW)	Dredge Footprint Area (sf)	Dredge Volume to Design Depth (cy)	Dredge Volume with 1-foot Overdredge (cy)	Dredge Volume with 2-foot Overdredge (cy)	Volume of Dredge to be Transported to the Pilot Project Site (cy)
Main Channel West	-10	292,536	20,100	30,940	41,770	10,000 – 13,500

Source: Moffatt & Nichol, August 2013 in OC Parks IS/MND
MLLW = mean lower low water
sf = square feet

The construction staging area for the maintenance dredging will be at the Sunset Aquatic Marina, likely in the parking lot area adjacent to the boat launch ramp. It is anticipated that maintenance dredging construction methods will involve a combination of a clamshell dredge, barge-based excavator, or cutter/suction head dredge equipment. Final construction methods will be determined by the construction contractor and will be subject to bridge clearances, channel/fairway widths and depths, and the location of boat docks.

All sediment generated from the maintenance dredging project will be disposed of offsite and could include one of the following disposal options: disposal at the USEPA-approved LA-2 open ocean site, which is located five nautical miles (nm) south of Point Fermin and 11.5 nm from the end of the Anaheim Jetties; reused at eelgrass mitigation sites within the Harbour or elsewhere; beach nourishment at a nearshore beach site; beneficial use associated with habitat enhancement; and as upland fill at an upland landfill site or port confined disposal site (OC Parks IS/MND).

Figure 4. Relationship of the Project Site to the Main Channel West Dredge Area

Sediment Application on the Refuge. Approximately 10,000 to 13,500 CY of material dredged from the Main Channel West site is to be transported to the 16-acre project site for distribution over 10 acres using one or more methods of transport and application. Potential options for transport of the material to the site include the use of a small containment barge, which would travel from the dredge site up one of the two existing tidal channels that abut the project site. Once the barge is in place, the sediment would be mixed with water and distributed on to the site using a rainbow sprayer, open pipe, or end-of-pipe baffle impingement.

Alternatively, the sediment may be transported as a slurry (i.e., a mixture of water and sediment) through a pipeline that would extend from the dredge site into the Refuge via one of the two existing tidal channels that abut the project site. The pipeline could be placed on the bed of bay and channel or floated on the water surface from the maintenance dredge site to the project site. Once at the project site, the slurry would be applied using a rainbow sprayer, open pipe, or end-of-pipe baffle impingement.

Under either option, the slurry will be applied to 10 acres of the 16-acre site as a fairly uniform thin layer of sediment, approximately 8 to 10 inches (20.32 to 25.4 centimeters [cm]) deep. It may be necessary to test various application methods at the beginning of the project to ensure uniform coverage. The entire process, which could take from four to six weeks to complete, will be adaptively managed to meet project design criteria, including achieving the desired depth of sediment within the confines of the 10-acre application site and minimizing the potential for introduction of sediment into the tidal channels that abut the site. The remaining six acres of the 16-acre site will provide a vegetated buffer around the augmentation site in an effort to minimize the movement of sediment off the site and into the adjacent tidal channels.

Site Preparation. Prior to initiating the sediment application process on the site, which is expected to occur between November 2014 and February 15, 2015, the three clapper rail artificial nesting platforms located in proximity to the project site (Figure 5) will be temporarily removed. The site will be monitored daily for the presence of clapper rails and other avian species, and if necessary, an air horn or cracker shells would be used to haze birds from the site prior to commencement of sediment application.

Containing Sediments within the Project Site. To minimize the movement of sediment off the application site, sediment will not be applied during any high tides predicted to inundate the project site. In addition, a six-acre buffer will be provided around the 10-acre site that will continue to support existing salt marsh vegetation. This buffer is intended to help trap any sediment that might flow off the 10-acre pilot project site during or following application.

An on-site monitor will be present during sediment application to ensure that sediment is not moving off the site. Sediment movement and turbidity levels will be monitored throughout the process. The monitor will have the authority to direct the contractor to adapt the application technique to avoid offsite impacts, as well as to require the implementation of additional measures, such as the instillation of a silt curtain or other appropriate barrier, should these measures be deemed necessary to minimize the effects of the project on adjacent habitats.

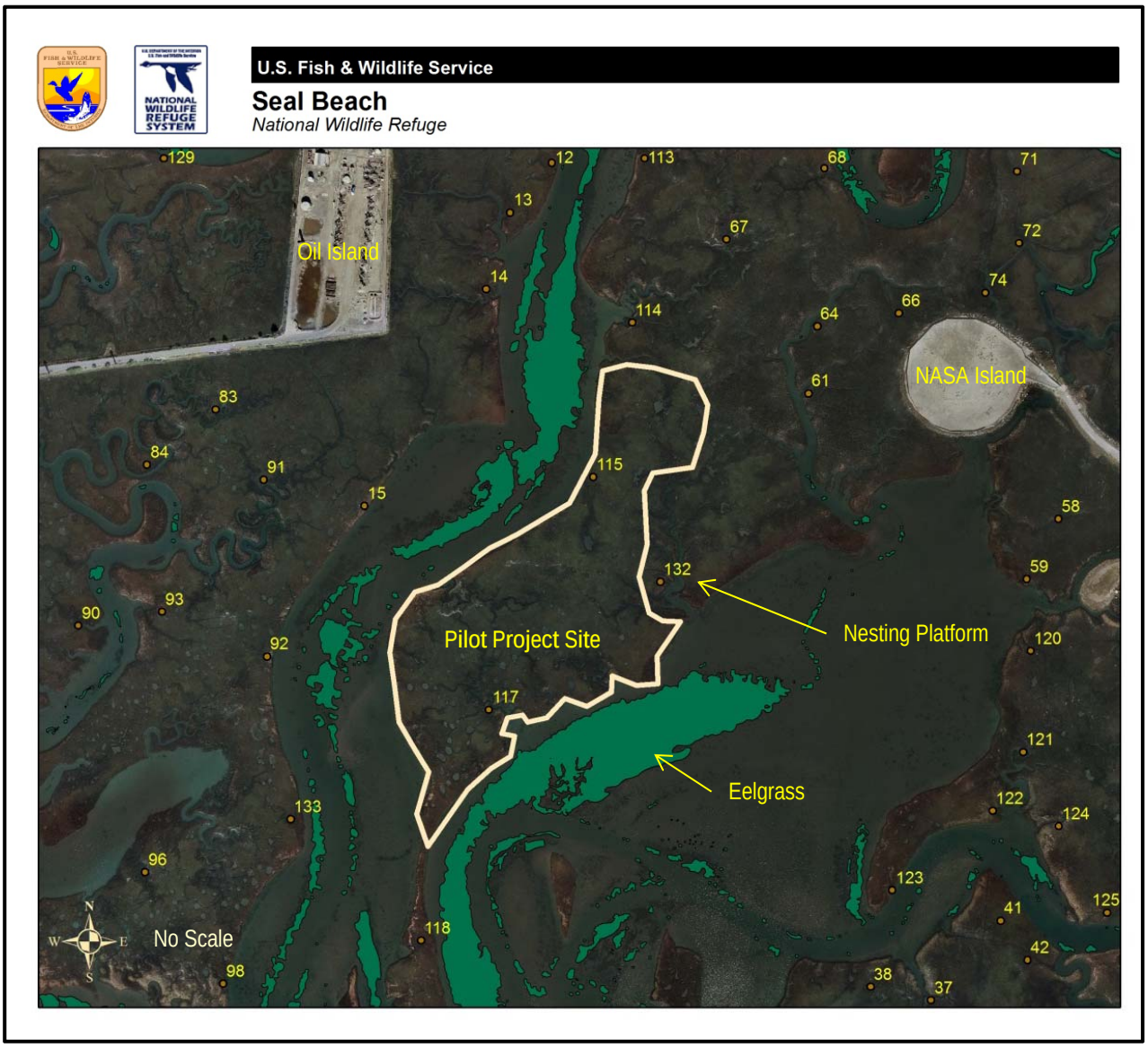

Figure 5. Relationship of the Pilot Project Site to Eelgrass and Artificial Nesting Platforms

<u>Pre- and Post-Sediment Application Monitoring</u>. Pre- and post-application monitoring is an essential component of the proposed action, as monitoring results will inform the Service and other land managers of the effectiveness of thin-layer sediment augmentation in achieving the project objectives, as well as facilitate the evaluation of the physical and ecological responses of the marsh ecosystem to the action.

Some of the key questions to be addressed through this monitoring program include:

- Will the application of sediment enable the light-footed clapper rail to nest naturally within the salt marsh habitats of the project area? If so, what is the time frame post-application for this to occur?

- How quickly will shorebirds, marshbirds, and other waterbirds return to the site for roosting and foraging?
- How will plants and invertebrates respond to the thin-layer application of sediment? Does it vary by species?
- How much sediment will remain on the application site during application, after 2 years, after 5 years?
- What effect does sediment application have on turbidity levels in adjacent waters?
- How effective is the vegetated buffer at reducing sediment runoff into adjacent tidal channels?
- What is the on-site sediment compaction rate, what is the depth of sediment following compaction?
- Following compaction, how has the topography of the site changed, are tidal channels forming?

The monitoring component of the pilot project will begin prior to application of the sediment and will continue for five years following the application of sediment to the site. Monitoring will require visual and physical access to the site both before and after sediment augmentation. Physical access will be achieved either by walking along the marsh surface from NASA Island or by using small motorized and non-motorized boats, depending upon the time of year. Most activities will occur on an annual basis and will require a presence on the project site for period of one to two days for most activities, but up to a week for more site intensive study such as elevation and vegetation surveys. Should clapper rails nest naturally within the project area during the five-year monitoring effort, any work near the nests, with the exception of clapper rail nest surveys, will be avoided during the breeding season (March 1 to September 15).

Monitoring efforts will include, but are not limited to pre- and post-application documentation of marsh plain elevations; vegetation cover and composition; cordgrass (*Spartina foliosa*) terminal evaluation, stem length, stem density, and physiological plant condition; conditions in adjacent eelgrass beds; infaunal invertebrate community structure; epifaunal community diversity; abundance and diversity of avian species; and light-footed clapper presence and use of the site. Monitoring will also determine sediment retention following application by cryo-coring within subplots pre-treated with a feldspar marker horizon; document the depth of the sediment across the site immediately following application and at various intervals thereafter; establish, the compaction rate of the applied sediment; and describe the pre-application status of tidal creek status, as well as the formation and/or reformation of tidal creeks following sediment application. Pre- and post-application monitoring of the eelgrass beds in the adjacent tidal channels will also occur.

5. Affected Environment

The discussion included in this section and the topics addressed in the Initial Study Checklist (Appendix A), provide information needed for making informed decisions on the effect that implementing the alternatives could have on the environment. Only those aspects of the

environment that are potentially affected by the alternatives (i.e., air quality, biological resources, cultural resources, greenhouse gas emissions, hazardous materials, water quality, noise, cumulative effects) are discussed in detail in this section. The Initial Study Checklist provides documentation of our consideration of all potential aspects of the affected environment.

Detailed information about the affected environment within and surrounding the Seal Beach NWR is provided in the Final Seal Beach NWR Comprehensive Conservation Plan (USFWS 2012). Additional information regarding the affected environment in and around OC Parks maintenance dredging project is provided in the OC Parks IS/MND.

A. Air Quality

Regional Setting and Context. The project site is located within the South Coast Air Basin (Basin), an area covering approximately 6,745 square miles and bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The extent and severity of air pollution in the Basin is a function of the area's natural physical characteristics and existing development patterns (OC Parks IS/MND). The accumulation and dispersion of pollutants throughout the Basin is affected by wind, sunlight, temperature, humidity, rainfall, and topography. As a result, pollutant concentrations in the Basin vary with location, season, and time of day.

Air quality within the Basin is managed by the South Coast Air Quality Management District (SCAQMD), which has jurisdiction over an area of about 10,743 square miles, including all of Orange County. The Basin is a subregion of SCAQMD's jurisdiction, and although air quality in this area has improved, the Basin requires continued diligence to meet air quality standards. Diesel particulate matter (DPM) continues to dominate the risk from air toxics.

Over the past 30 years, substantial progress has been made in reducing air pollution levels in Southern California. However, even though there has been improvement in air quality with respect to air toxics, the risks are still unacceptable and higher near sources of emissions such as ports and transportation corridors. Diesel particulate matter (DPM) continues to dominate the risk from air toxics; the portion of the air toxic risk attributable to diesel exhaust is increasing compared with the risk level found in the MATES II study (OC Parks IS/MND).

The MATES III study concluded that the average carcinogenic risk throughout the Basin attributable to toxic air contaminants (TACs) is approximately 1,194 in one million. Mobile sources (e.g., cars, trucks, trains, ships, aircraft) are the greatest contributors. About 84 percent of all risk is attributable to DPM emissions.

Data from the closest climate monitoring station, the Western Regional Climate Center (WRCC) station at Long Beach Airport, was used to characterize project vicinity climate conditions. The average project area summer (August) high and low temperatures are 84°F and 65°F, respectively; the average winter (January) high and low temperatures are 67°F and 46°F, respectively. The average annual rainfall is approximately 12 inches (WRCC 2012).

The closest wind monitoring station is the Long Beach wind monitoring station, which was used to characterize study area wind conditions. Wind patterns in the project vicinity arise primarily as onshore flows from the west, with seasonal and diurnal variations resulting in northeasterly (during Santa Ana events) and southerly winds (before and during winter storms and during eddy conditions in summer) (National Oceanic and Atmospheric Administration [NOAA] n.d.). Wind speeds average 3.15 miles per hour (1.41 meters per second); calm wind conditions are present approximately 17.48 percent of the time (OC Parks IS/MND).

SCAQMD has divided the Basin into air monitoring areas, and the project site is located in the North Orange County Coastal Area (i.e., Source Receptor Area [SRA] Number 18). The nearest monitoring stations are the South Long Beach station, located approximately seven miles northwest of the project site, and the North Long Beach station, located approximately nine miles northwest of the project site. The South Long Beach station monitors particulate matter less than or equal to 10 micrometers in diameter (PM10) and particulate matter less than or equal to 2.5 micrometers in diameter (PM2.5); the North Long Beach station monitors ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2) (OC Parks IS/MND).

Based on the most recent complete data sets for air quality in the area, which cover the period from 2010 to 2012, the State 1-hour O_3 standard was exceeded once during the 3-year reporting period; the State and Federal 8-hour O_3 standards were each exceeded once during the 3-year period; CO concentrations were low and no exceedances were recorded during the 3-year reporting period; the Federal NO_2 standard was exceeded once during the 3-year period; the State 24-hour PM10 standard was exceeded three times during the 3-year reporting period.; and the Federal PM2.5 standard was exceeded eight times during the 3-year reporting period (OC Parks IS/MND).

Sensitive Receptors and Locations. Uses supporting sensitive receptors, such as children, the elderly, and acutely or chronically ill persons, that occur near the project area include residences located approximately 3,000 feet to the southwest and the Sunset Aquatic Marina located approximately 2,600 feet to the southeast of the sediment augmentation site.

Federal Regulatory Setting. The Clean Air Act (CAA) establishes the National Ambient Air Quality Standards (NAAQS) and specifies future dates for achieving compliance. The CAA also mandates that States submit and implement a State Implementation Plan (SIP) for local areas that fail to meet the standards. The plans must include pollution control measures that demonstrate how the standards will be met. Basin has been designated as a nonattainment area for certain pollutants that are regulated under the CAA.

The 1990 amendments to the CAA identify specific emission-reduction goals for areas that fail to meet the NAAQS. These amendments require both a demonstration of reasonable progress toward attainment and the incorporation of sanctions for failure to attain or meet interim milestones. The sections of the CAA that would most substantially affect the proposed project include Title I (Nonattainment Provisions) and Title II (Mobile-Source Provisions).

Title I provisions were established with the goal of attaining the NAAQS for criteria pollutants. In 1997, the NAAQs were amended to include a standard for PM2.5 and an 8-hour standard for O_3. The NAAQS for each criteria pollutant is listed in Table 2. The Orange County portion of the Basin is considered a Federal nonattainment area for O_3, PM10, and PM2.5, because the Federal standards for these pollutants are not being met.

California Regulatory Setting**.** The California Clean Air Act (CCAA) requires all areas of the State to achieve and maintain the California Ambient Air Quality Standards (CAAQS) by the earliest practical date. The CAAQS, which are more health protective than the corresponding NAAQS, incorporate additional standards for most criteria pollutants. The California standards also address other pollutants not recognized in the NAAQS, including standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. The Basin is in compliance with the California standards for sulfates, hydrogen sulfide, visibility-reducing particles, and vinyl chloride. Presented in Table 2 are the current NAAQS and CAAQS.

Table 2
Federal and State Ambient Air Quality Standards

Pollutant	**Averaging Time**	**CAAQS[a]**	**NAAQS[b]**
Ozone (O_3)	1 hour 8 hours	0.09 ppm[c] 0.070 ppm	— 0.075 ppm
Carbon Monoxide (CO)	1 hour	20 ppm	35 ppm
	8 hours	9.0 ppm	9 ppm
Nitrogen Dioxide (NO_2)	1 hour	0.18 ppm	100 ppb
	Annual Arithmetic Mean	0.030 ppm	53 ppb
Sulfur Dioxide (SO_2)	1 hour	0.25 ppm	75 ppb
	24 hours	0.04 ppm	0.14 ppm
Respirable Particulate Matter (PM10)	24 hours	50 µg/m^3 [c]	150 µg/m^3
	Annual Arithmetic Mean	20 µg/m^3	—
Fine Particulate Matter (PM2.5)	24 hours	—	35 µg/m^3
	Annual Arithmetic Mean	12 µg/m^3	12.0 µg/m^3
Sulfates	24 hours	25 µg/m^3	—
Lead (Pb)	30-day average	1.5 µg/m^3	—
	Calendar quarter	—	1.5 µg/m^3
	Rolling 3-month Average	—	0.15 µg/m^3
Hydrogen Sulfide	1 hour	0.03 ppm	—
Vinyl Chloride	24 hours	0.01 ppm	—

[a] CAAQS for O_3, CO, SO_2 (1-hour and 24-hour standards), NO_2, PM10, and PM2.5 are values not to be exceeded. All other California standards shown are values not to be equaled or exceeded.
[b] The NAAQS, other than those for O_3 and those based on annual averages, are not to be exceeded more than once a year. The O_3 standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than 1.
[c] ppm = parts per million by volume; ppb = parts per billion; µg/m^3 = micrograms per cubic meter.
Sources: CARB 2013, EPA 2013.

Table 3 addresses the attainment status for the Orange County portion of the Basin with respect to the NAAQS and CAAQS.

Table 3 Federal and State Attainment Status for the Orange County Portion of the South Coast Air Basin		
Pollutants	**Federal Classification**	**State Classification**
O_3 (1-hour standard)	—	Nonattainment
O_3 (8-hour standard)	Nonattainment, Extreme	Nonattainment
PM10	Attainment	Nonattainment
PM2.5	Nonattainment	Nonattainment
CO	Attainment/Maintenance	Attainment
NO_2	Attainment/Maintenance	Attainment
SO_2	Attainment	Attainment
Sources: ARB 2013, EPA 2014.		

South Coast Air Quality Management District. SCAQMD has adopted a series of air quality management plans (AQMPs) to meet the CAAQS and NAAQS. These plans require, among other emissions-reducing activities, control technology for existing sources; control programs for area sources and indirect sources; a SCAQMD permitting system, designed to allow no net increase in emissions from any new or modified (i.e., previously permitted) emission sources; and transportation control measures. The most recent AQMP was completed in 2012.

The Final 2012 AQMP was adopted by the SCAQMD Governing Board on December 7, 2012. Control measure IND-01 was approved for adoption and inclusion in the Final 2012 AQMP at the February 1, 2013, Governing Board meeting. The California Air Resources Board (CARB) approved the 2012 AQMP on January 25, 2013, and the AQMP has been submitted to EPA as a revision to the California SIP (ARB 2013). The 2012 AQMP addresses CAA requirements and includes a 24-hour PM2.5 plan, additional 8-hour O_3 measures with a vehicle-miles-traveled (VMT) offset demonstration, and a 1-hour O_3 attainment demonstration with VMT offset demonstration.

SCAQMD published the *CEQA Air Quality Handbook* in November 1993 (with subsequent updates) to help local governments analyze and mitigate project-specific air quality impacts. This handbook provides standards, methodologies, and procedures for conducting air quality analyses as part of CEQA documents prepared within SCAQMD's jurisdiction. In addition, SCAQMD has published two additional guidance documents—*Localized Significance Threshold Methodology for CEQA Evaluations* (2003, revised 2008) and *Particulate Matter (PM) 2.5 Significance Thresholds and Calculation Methodology* (2006)—that provide guidance for evaluating localized effects from mass emissions during construction. These documents (SCAQMD 2006, 2008a) were used to analyze the potential effects to air quality of the proposed project.

The SCAQMD daily thresholds for construction emissions are presented in Table 4.

Table 4
SQAQMD Significance Thresholds for Construction (pounds per day)

Pollutant	Construction Thresholds	
	Regional	**Localized [a]**
Nitrogen Oxides (NO_X)	100	92
Volatile Organic Compounds (VOCs)	75	N/A
Suspended Particulate Matter (PM10)	150	4
Fine Particulate Matter (PM2.5)	55	3
Sulfur Oxides (SO_X)	150	N/A
Carbon Monoxide (CO)	550	647
Lead (Pb)[b]	3	N/A

[a] Localized thresholds derived from SCAQMD's most recent LST tables are based on the project location (SRA 18, North Orange County Coastal), the project area disturbed in any given day (1 acre), and the distance to the nearest sensitive receptor (25 meters). SCAQMD has not developed LSTs for VOC, SO_X, or Pb emissions.
[b] The proposed project will result in no lead emissions sources during the construction or operations period. As such, lead emissions are not evaluated herein.
Source: SCAQMD 2009, 2011b and OC Parks IS/MND.

Federal actions, including the implementation of the proposed action, are regulated by Rule 1901 - General Conformity in the Rules and Regulations of the SCAQMD. The provisions of Rule 1901, which apply to Federal actions conducted within the South Coast Air Basin, were incorporated into the regulations in accordance with Part 51, Subpart W, Title 40 of the Code of Federal Regulations (CFR). CFR Section 51.850 states that no department, agency, or instrumental of the Federal Government shall engage in, support in any way, provide financial assistance for, license or permit, or approve any activity that does not conform to the applicable air quality implementation plan, in this case the SCAQMD's 2012 AQMP (SCAQMD 2013).

Conforming activities or actions should not, through additional air pollutant emissions:

- Cause or contribute to new violations of any NAAQS in any area;
- Increase the frequency or severity of any existing violation of any NAAQS; or
- Delay timely attainment of any NAAQS or interim emission reductions.

The General Conformity Rule establishes conformity in coordination with and as part of the NEPA process. The rule takes into account air pollutant emissions associated with actions that are federally funded, licensed, permitted, or approved, and ensures emissions do not contribute to air quality degradation, thus preventing the achievement of State and Federal air quality goals. The general project area is designated as an extreme non-attainment area for the 8-hour NAAQS for O_3 and a non-attainment area PM2.5. It is a maintenance area for CO and NO_2.

In the South Coast Air Basin, a conformity determination is required for each pollutant where the total direct and indirect emissions in a non-attainment or maintenance area caused by a Federal action would equal or exceed established rates. As a non-attainment area for O_3 and PM2.5, the following rates apply:

Ozone (VOCs or NO_x) – 25 tons/year,
PM2.5 direct emissions – 100/tons/year,
PM2.5 SO_2 – 100/tons/year,
PM2.5 NO_x – 100/tons/year, or
PM2.5 VOC or ammonia – 100/tons/year.

As a maintenance area for CO and NO_2, the following rates apply:

CO – 100 tons/year, or
NO_2 – 100 tons/year.

The requirements of Rule 1901 do not apply to Federal actions where the total of direct and indirect emissions is below these emission levels. However, when the total of direct and indirect emissions of a pollutant from a Federal action represents 10 percent or more of an area's total emissions of that pollutant, the action is defined as a regionally significant action.

B. Biological Resources

Regional Setting and Context. Most of what remains of the historical Anaheim Bay marsh complex is protected within the Seal Beach NWR. Other remnants of the historical bay have been altered to accommodate boat channels and marinas. Technically, today the "bay" is not a bay at all; rather, it consists of a man-made inner and outer harbor and the remnants of a much larger salt marsh complex (CDFG and USFWS 1976). The areas within the Refuge support habitats historically found along the southern California coast, with much of the site falling under the estuarine intertidal or estuarine subtidal habitat classification per the National Wetlands Inventory (USFWS 2010). Approximately 740 acres within the Refuge are subject to regular, unobstructed tidal influence, supporting 565 acres of coastal salt marsh vegetation, 60 acres of intertidal mudflats, and 115 acres of tidal channels and open water.

The proposed pilot project will occur within a 16-acre area of low salt marsh habitat, an area of the marsh that is subject to regular inundation. Dominant species within this habitat type include cordgrass and Pacific pickleweed (*Sarcocornia pacifica*). This habitat supports an array of avian and invertebrates species. Cordgrass-dominated salt marsh habitat is particularly important to the endangered light-footed clapper rail, which uses this vegetation for foraging, nesting, and cover from predators.

Vegetation. Cordgrass and Pacific pickleweed are the dominant species within the 16-acre project site. Cordgrass is also quite abundant throughout the Refuge's low marsh habitat, but its pattern of growth on the Refuge is much different from that of nearby Upper Newport Bay. The density of the cordgrass in the two locations is very similar, but the height and cover of the cordgrass on the Refuge is compromised by relative lack of freshwater influence

within the marsh (USFWS and U.S. Navy 1991) and land subsidence. The lower elevation of the salt marsh on the Refuge combined with short stem height, results in the complete inundation of the cordgrass stands in Anaheim Bay during all but the lowest of high tides. This prolonged immersion has additional adverse effects on plant vigor as a result of reduced oxygen availability to the roots and reduced sunlight to the stems (Massey et al. 1984).

The average height of the cordgrass within the 16-acre project site when surveyed in October 2011 was 43.2 cm (Katherine Powelson, USGS, pers. Comm.). The average height of the cordgrass throughout the Refuge during a study conducted in 1979 was 57 cm, with stem heights ranging from 43 to 76 cm (Massey et al. 1984). According to Zedler (1993), "reference data from natural marshes that are used by clapper rails indicate that the standard for "suitable habitat" should be a density of at least 100 stems/m^2 with at least 90 stems/m^2 greater than 60 cm, of which at least 30 stems/m^2 are greater than 90 cm in height." The extent of inundation experienced in the Refuge's low marsh habitat, along with the reduced stem heights and percent cover of much of the cordgrass, directly affects habitat quality for the Refuge's population of light-footed clapper rail (USFWS 2012).

In addition to cordgrass and Pacific pickleweed, seven other plant species were identified on the 16-acre site by USGS in October 2011. These species included saltwort (*Batis maritima*), annual pickleweed (*Salicornia bigelovii*), jaumea (*Jaumea carnosa*), alkali heath (*Frankenia salina*), and saltgrass (*Distichlis spicata*), with a few specimens of California sealavender (*Limonium californicum*) and seablite (*Suaeda esteroa*). All are native salt marsh species.

The 16-acre project site is surrounded to the north, south, and west by two major tidal channels that support shallow subtidal habitat. Surveys conducted in these channels in April 2013 by Merkel & Associates (M&A) identified multiple patches of eelgrass (*Zostera marina*) (refer to Figure 5). The eelgrass beds within these two tidal channels are interspersed sparsely with the red alga (*Gracilaria verrucosa*) and green alga (*Ulva* sp.) (M&A 2014).

Eelgrass, an aquatic flowering grass, is an important component of coastal California's shallow subtidal habitat providing foraging and shelter for a variety of fish and invertebrate species, as well as foraging habitat for migratory birds. The Southern California Eelgrass Mitigation Policy (1991) describes eelgrass vegetated areas as "important ecological communities because of their multiple biological and physical values. Eelgrass habitat functions as an important structural environment for resident bay and estuarine species, offering both predation refuge and a food source. Eelgrass functions as a nursery area for many commercially and recreational important finfish and shellfish species, including those that are resident within bays and estuaries, as well as oceanic species that enter estuaries to breed or spawn. Eelgrass also provides a unique habitat that supports a high diversity of non-commercially important species whose ecological roles are less well understood."

Birds. Seal Beach NWR and several nearby coastal wetland areas have collectively been recognized by the National Audubon Society as the Orange Coast Wetlands Important Bird Area (IBA). The areas within the Orange Coast Wetlands (each of which could qualify as a separate IBA) protect some of south California's most extensive wetlands, wetlands that provide essential foraging, resting, and nesting habitat for a variety of coastal-dependent

migratory and resident bird species. More information and a species list for the Refuge are provided in the Seal Beach NWR CCP (USFWS 2012).

Avian surveys are routinely conducted throughout the Refuge. In addition to those surveys, specific surveys of avian use within the sediment augmentation site have been conducted twice monthly since April 15, 2014. Seven such surveys have been conducted to date with nine species observed, as indicated in Table 5.

Table 5
Results of Recent Avian Surveys of the 16-Acre Project Site

Species Observed	Survey Dates in 2014						
	April 15	May 4	May 13	June 15	June 21	July 13	July 19
Great blue heron (*Ardea herodias*)	2	-	1	1	2	-	1
Great egret (*Ardea alba*)	2	1	-	-	1	2	-
Snowy egret (*Egretta thula*)	-	-	-	-	1	-	-
Black-bellied plover (*Pluvialis squatarola*)	-	2	-	-	-	-	6
Willet (*Tringa semipalmata*)	1	2	-	-	-	-	-
Long-billed curlew (*Numenius americanus*)	-	-	-	-	-	-	1
Marbled godwit (*Limosa fedoa*)	-	-	-	-	-	-	1
Short-billed dowitcher (*Limnodromus griseus*)	-	-	-	-	-	-	3
Light-footed clapper rail *(Rallus longirostris levipes)*	-	-	-	-	-	-	2

Benthic Invertebrates. Surveys conducted in the 1970s identified at least 116 species of marine invertebrates in the salt marsh area of Anaheim Bay (Reish et al. 1975). Of the species identified, polychaetes comprised about 65 percent, crustaceans about 15 percent, and mollusks 13 percent. This and other studies indicate that a diverse array of invertebrates inhabit the estuarine and marsh habitats on the Refuge. These creatures fulfill many purposes within the bay and the marsh, including scavenging, filter feeding, and detritus feeding.

Mollusk communities in southern California salt marshes are typically dominated by *Cerithidea californica*, *Melampus olivaceous*, and *Assiminea californica*, which are all epifaunal surface feeders (USFWS and U.S. Navy 1991). Most mollusks are detritus and filter feeders or grazers, and to a lesser extent, predators. The California hornsnail (*Cerithidia californica)*, which serves as food for crabs and birds, is widespread in the Refuge.

As part of the recently conducted fish and benthic community surveys within Anaheim Bay (M&A 2014), epibenthic invertebrates (i.e., invertebrates that live on sea floor sediments) captured in the fish sampling gear were identified, counted, and released to further assist with the habitat characterization. The intent of this action was to generate a list of species that occur in the study area, rather than to provide definitive density and biomass data on their

populations. The list of species generated from this effort, although considered a partial list of the species present in Anaheim Bay, is representative of common species found in Anaheim Bay (M&A 2014). Table 6 provides a list of those species captured in the general vicinity of the Refuge project site, an area referred to in the survey report as survey area A3.

Table 6
Epibenthic Invertebrates Captured at Survey Area A3 during the 2013 Anaheim Bay Benthic and Fish Community Assessments

Phylum	Scientific Name	Common Name	Number of Individuals Captured				
			Totals for the 2013 Survey	Feb. 2013	April 2013	July 2013 (combined day and night surveys)	Oct. 2013
Bryozoa	*Zoobotryon verticillatum*	spaghetti bryozoan	4	0	0	2	2
Mollusca	*Arcularia tiarula*	mud dog whelk	2	0	0	1	1
	Argopecten ventricosus	speckled scallop	250	0	0	147	103
	Bulla gouldiana	bubble snail	1,775	287	9	587	892
	Caesia perpinguis	western fat dog whelk	1	0	0	1	0
	Cerithidea californica	California hornsnail	10	0	0	7	3
	Crepidula sp.	slipper shell	68	0	0	10	58
	Kelletia kelletii	Kellet's whelk	2	0	0	2	0
	Laevicardium substriatum	Pacific egg cockle	1	0	0	0	1
	Navanax inermis	navanax	52	19	5	2	26
Arthropoda	*Cancer oregonensis*	pygmy rock crab	1	1	0	0	0
	Emerita sp.	mole crab	9	0	9	0	0
	Farfantepenaeus californiensis	brown shrimp	2	0	0	2	0
	Hemigrapsus oregonensis	yellow shore crab	3	1	0	2	0
	Heptacarpus sp.	broken back shrimp	14	0	13	1	0
	Hippolyte sp.	grass shrimp	68	19	16	30	3
	Pachygrapsis crassipes	lined shore crab	3	0	0	3	0
	Palaemon macrodactylus	Oriental shrimp	1	0	0	1	0
	Portunus xantusii	Xantu's swimming crab	2	1	1	0	0
	Pugettia producta	northern kelp crab	1	0	0	0	1

Source: M&A 2014

A total of 56 species of epibenthic invertebrates were captured throughout the study area during the 2013 surveys, and of these, 20 species were captured within survey area A3, which includes the project site. During survey work conducted in February 2013, six species were captured in survey area A3 using the large beach seine, otter trawl, and purse seine. Bubble snail (*Bulla gouldiana*) was by far the most abundant species encountered (M&A 2014). Six species were also captured in April 2013 in survey area A3, but not all the species were the same as those captured in February. The two most abundant species were slender green shrimp or grass shrimp (*Hippolyte californiensis*) and broken back shrimp (*Heptacarpus* sp.). The grass shrimp, which was also abundant throughout the larger study area, was particularly abundant in the eelgrass beds located in survey area A3.

In July 2013, a combined total of 15 species of epibenthic invertebrates were captured during daytime and nighttime fish surveys, representing the greatest species diversity observed in survey area A3 during the study. The July catch was dominated by bubble snail, with speckled scallop (*Argopecten ventricosus*) the second most abundant species encountered (M&A 2014). Ten species were captured in survey area A3 during the October 2013 surveys, and the dominate species was once again bubble snail followed by speckled scallop.
Over the years, eighteen species of crustaceans have been documented in Anaheim Bay. In their larval form, they are an important food source for birds and fish. Crabs are conspicuous as they forage on mudflats. Amphipods, ostracods and copepods are abundant in subtidal and intertidal areas. Amphipods (*Orchestia traskiana* and *O. californica*) and isopods are found under debris near the upper margins of the marsh and ghost shrimp (*Callianassa californiensis*) live in muddy sediments.

Also observed on the Refuge in previous surveys was the California brackish water snail (*Tryonia imitator*), a species identified by the State of California as imperiled (USFWS and U.S. Navy 1991). This species, which inhabits coastal lagoons, estuaries, and salt marshes, is found only in permanently submerged areas and can tolerate a wide range of salinities and sediment types (Kellogg 1980). This species was not documented during the 2013 study.

Fisheries. The earliest available information regarding fish populations in Anaheim Bay is from a paper published in 1916 by Carl Hubbs, who collected fish in the bay in 1913. Additional collections were made by Hubbs and the California State Fisheries Laboratory between 1919 and 1928 (Lane 1975). No attempts to record the diversity of fish fauna in Anaheim Bay were made again until 1969, when a four-year effort to describe the biology of the bay was undertaken by California State University, Long Beach. Surveys to establish fish diversity in the bay were conducted between 1969 and 1971. A full account of the results of these surveys is provided in Fish Bulletin #165, “The Marine Resources of Anaheim Bay” (CDFG 1975) and summarized in the Seal Beach NWR Final CCP (USFWS 2012).

New studies were recently funded by the U.S. Navy that provide updated fish and benthic community surveys and marine habitat assessments within Anaheim Bay and the channels and ponds of Naval Weapons Station Seal Beach and the Seal Beach NWR. These surveys, which were conducted in 2013, included four quarterly (February, April, July, and October) daytime surveys and one nighttime survey conducted during the summertime sampling interval in July. Fish surveys were conducted in the two channels located adjacent to the

Refuge project site and included the use of purse seines and otter trawls. Beach seines were also used to sample adult and juvenile fish along shallow water shoreline habitats located farther to the south of the project site. A complete description of the sampling methods and the results of the surveys are provided in a final report entitled "2013 Anaheim Bay Benthic and Fish Community Assessments at Naval Weapons Station Seal Beach" (M&A 2014).

The total number of fish species captured throughout the study area during the 2013 surveys was 57 species (M&A 2014). The final survey report notes that the number of species captured varied by quarter, with 24 species captured in February, 30 species in April, 50 species in July (41 species during the daytime survey and 43 species during the nighttime survey), and 36 species in October. A total of 36 species were identified in survey area A3 during the year-long assessment (M&A 2014).

Similar to the results of the surveys conducted in the early 1970s, the 2013 studies found that fish abundance in the study area was highest in the summer. The 2013 studies also found that fish abundance was lowest in January. Although the most comment fish species collected throughout the study area was queenfish (*Seriphus politus*), followed by topsmelt (*Atherinop affinis*) and northern anchovy (*Engraulis mordax*), within survey area A3, the most abundance species collected was topsmelt, followed by northern anchovy, and queenfish. Provided in Table 7 is a complete list of the fish species collected in survey area A3 during the 2013 Anaheim Bay Benthic and Fish Community Assessments.

Table 7
Fish Species Collected in Survey Area A3 during the 2013 Anaheim Bay Benthic and Fish Community Assessments

Scientific Name	**Common Name**	**Number of Individuals Collected Near the Project Site**					
(listed in order of individuals collected from most abundant to least abundant)		**Totals for the 2013 Survey**	Feb. 2013	April 2013	July 2013 (day)	July 2013 (night)	Oct. 2013
Atherinop affinis	Topsmelt	7,544	87	89	4,932	673	1,763
Engraulis mordax	Northern anchovy	2,110			261	1,841	8
Seriphus politus	Queenfish	473		1	106	80	286
Cymatogaster aggregata	Shiner surfperch	241		70	110	4	57
Paralabrax nebulifer	Barred sand bass	241			86	120	35
Urobatis halleri	Round stingray	143	30	72	21	15	5
Ilypnus gilberti	Cheekspot goby	97	1	1	17	76	2
Leuresthes tenuis	California grunion	90				83	7
Leptocottus armatus	Staghorn sculpin	75	18	31	8	18	
Sardinops sagax	Pacific sardine	59			55	4	
Syngnathus leptorhynchus	Bay pipefish	54	3	1	12	4	34
Heterostichus rostratus	Giant kelpfish	43	2	18	16	6	1
Clevelandia ios	Arrow/Shadow goby	37	4		33		

Table 7 Fish Species Collected in Survey Area A3 during the 2013 Anaheim Bay Benthic and Fish Community Assessments							
Scientific Name	**Common Name**	**Number of Individuals Collected Near the Project Site**					
(listed in order of individuals collected from most abundant to least abundant)		**Totals for the 2013 Survey**	Feb. 2013	April 2013	July 2013 (day)	July 2013 (night)	Oct. 2013
Paralichthys californicus	California halibut	37	5	7	5	15	5
Pleuronichthys guttulatus	Diamond turbot	29	2	5	5	14	3
Paralabrax clathratus	Kelp bass	27		3	1		23
Roncador stearnsii	Spotfin croaker	19		13	3	3	
Paralabrax maculatofasciatus	Spotted sand bass	18	10	2	3	1	2
Umbrina roncador	Yellowfin croaker	15		10	3	2	
Fundulus parvipinnis	California killifish	9		1		3	5
Hyperprosopon argenteum	Walleye surfperch	9					9
Hypsoblennius gentilis	Bay blenny	8		2		2	4
Acanthogobius flavimanus	Yellowfin goby	7			2	5	
Porichthys myriaster	Specklefin midshipman	6				6	
Anisotremus davidsonii	Sargo	5			1		4
Xenistius californiensis	Salema	4					4
Syngnathus auliscus	Barred pipefish	3			3		
Atractoscion nobilis	White seabass	3					3
Mustelus californicus	Gray smoothhound shark	2			1	1	
Anchoa compressa	Deepbody anchovy	2				1	1
Anchoa delicatissima	Slough anchovy	2	1	1			
Strongylura exilis	California needlefish	1				1	
Atherinops californiensis	Jacksmelt	1				1	
Embiotoca jacksoni	Black surfperch	1	1				
Symphurus atricaudus	California tonguefish	1		1			
Gymnura marmorata	California butterfly ray	1		1			

Source: M&A 2014

Essential Fish Habitat. The Magnuson-Stevens Act, as amended in 1996, states, “One of the greatest long-term threats to the viability of commercial and recreational fisheries is the continuing loss of marine, estuarine, and other aquatic habitats. Habitat considerations should receive increased attention for the conservation and management of fishery resources of the United States (16 U.S.C. 1801 (A)(9)).” The Magnuson-Stevens Act, as amended, requires Fishery Management Councils to amend all of their Fish Management Plans to describe and identify Essential Fish Habitat (EFH) for the fishery based on guidelines established by National Marine Fisheries Service (NMFS) to minimize to the extent practicable adverse effects on such habitat caused by fishing, and to identify other actions to encourage the conservation and enhancement of EFH.

EFH is defined by the Magnuson-Stevens Act as “those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” EFH can include both the water column and the underlying bottom substrate of a particular area. Areas designated as EFH contain habitat that is critical to the long-term health of our nation's fisheries. Various properties within the water column such as temperature, nutrients, or salinity can significantly influence which species are present. If these properties are changed, some species could be displaced. The integrity of the underlying ocean floor or tidal channel can also effect species composition and abundance. Some species may require unvegetated sandy or rocky bottoms, while others require underlying surfaces that are vegetated with seagrasses or kelp. Still others rely on structurally complex coral or oyster reefs. A single species may use many different habitats throughout its life to support breeding, spawning, nursery, feeding, and protection functions. EFH encompasses all of those habitats necessary to ensure healthy fisheries now and in the future (NOAA Fisheries, Office of Habitat Conservation, Essential Fish Habitat Webpage).

The Magnuson-Stevens Act also requires that Federal agencies consult with NMFS about any ongoing or proposed actions they may authorize, fund, or undertake that may adversely affect any EFH. If the action could adversely affect EFH, NMFS will provide recommendations to conserve EFH. Federal agencies must then respond within 30 days of receiving conservation recommendations from NMFS, describing measures to avoid, mitigate, or offset the impact of the proposed action on EFH.

Some EFH has been further defined to address Habitat Areas of Particular Concern (HAPC). HAPC, identified in specific fish management plans to help provide additional focus for conservation efforts, consist of areas supporting ecological functions that are very important or are especially vulnerable to degradation. A specific habitat area may be designated as an HAPC based on the importance of the ecological function provided by the habitat, the extent to which the habitat is sensitive to human-induced environmental degradation, the rarity of the habitat type, and/or the extent to which development activities are, or could be, stressing the habitat (PFMC 2014). The HAPC designation does not impose additional protection or restrictions upon an area.

Anaheim Bay includes areas identified as EFH for various life stages of fish species managed under the Pacific Groundfish and Coastal Pelagic Species Fishery Management Plans. The Pacific Coast Groundfish Fishery Management Plan (FMP) (PFMC 2014) manages more

than 90 species of fish over a large and ecologically diverse area. Fish such as rockfish, roundfish, flatfish, and certain sharks that are often (but not exclusively) found on or near the ocean floor or other structures are managed under this plan. EFH for groundfish includes all areas off the Pacific Coast with depths less than or equal to 3,500 meters to mean higher high water level (MHHW) or the upriver extent of saltwater intrusion, defined as upstream and landward to where ocean-derived salts measure less than 0.5 parts per thousand (ppt) during the period of average annual low flow. Two of the HAPCs that have been identified for this EFH, estuaries and seagrass, occur within the Refuge. None of the species managed under the Coast Groundfish FMP were collected within survey area A3, but California scorpionfish (*Scorpaena gutatta*) was identified in other portions of the survey area and a leopard shark (*Triakis semifasciata*) was noted in survey area A1, located to the west of Anaheim Bay (M&A 2014). A third species, English sole (*Parophrys vetulus*) was collected in Anaheim Bay in the 1970s (Klingbeil et al. 1975).

The Coastal Pelagic Species Fishery Management Plan (PFMC 2011) includes four finfish (Pacific sardine [*Sardinops sagax*], Pacific [chub] mackerel [*Scomber japonicas*], central and northern subpopulations of northern anchovy [*Engraulis mordax*], and jack mackerel [*Trachurus symmetricus*]), market squid (*Loligo opalescens*), and all euphausid (krill) species that occur in the West Coast exclusive economic zone. Coastal pelagic species generally live nearer to the surface than the seafloor and the EFH is based on the temperature range where they are found, and on the geographic area where they occur at any life stage. This range varies widely according to ocean temperatures. This EFH includes all marine and estuary waters from the coasts of California, Oregon, and Washington to the 200-mile limit and above the thermocline where sea surface temperatures range between 10° and 26° Celsius. Northern anchovy and Pacific sardine were present in survey area A3 during the 2013 fish surveys (M&A 2014).

Endangered and Threatened Species and Other Species of Concern. The area within the vicinity of the Main Channel West dredge site and the 16-acre Refuge project site are known to support three federally listed endangered species, including the light-footed clapper, California least tern, and eastern Pacific green turtle. The federally listed threatened Pacific Coast population of western snowy plover (*Charadrius nivosus nivosus*), although occasionally observed on the Refuge in the past, has not been identified on the Refuge in the past few years. Other species of concern include the State endangered Belding's savannah sparrow (*Passerculus sandwichensis beldingi*), nine migratory birds (USFWS 2012) identified by the Service as Birds of Conservation Concern (USFWS 2008), and six California Special Status Species, including seablite (USFWS 2012).

Light-footed Clapper Rail (*Rallus longirostris levipes*)

The light-footed clapper rail, which can be observed in southern California coastal salt marshes, lagoons, and their maritime environs, typically nest in the lower littoral zone of coastal salt marshes where dense stands of cordgrass are present. They require shallow water and mudflats for foraging, with adjacent higher vegetation for cover during high water (Massey et al. 1984).

Light-footed clapper rails forage in all parts of the salt marsh, concentrating their efforts in the lower marsh when the tide is out, and moving into the higher marsh as the tide advances. Foraging activity is greatest in the early morning, while vocalizing shows a strong peak just before dark. Activities are also tide-dependent. The rails are omnivorous and opportunistic foragers. They rely mostly on salt marsh invertebrates, such as beetles (*Coleoptera*), California hornsnails, salt marsh snails (*Melampus olivaceus*), fiddler and hermit crabs, crayfish, isopods, and decapods.

The pair bond in light-footed clapper rails endures throughout the season, and often from year to year. Nesting usually begins in March and late nests have usually hatched by August. A nest generally contains four to eight eggs, which hatch in 18 to 27 days. Both parents care for the young. While one adult is foraging, the other adult broods the chicks. By the age of two days, chicks will accompany adults on foraging trips; however, adults have been observed feeding fully-grown chicks of at least six weeks of age within 82 feet (25 meters) of their incubation nest. These rails generally construct a nest for egg laying, and a second nest, an incubation nest, for brooding the young.

In most southern California marshes that support light-footed clapper rails, rail nests are typically placed to avoid flooding by tides, yet in dense enough cover to be hidden from predators and support the relatively large nest. Cordgrass provides the preferred nesting habitat for light-footed clapper rails. Massey et al. (1984) describes the classical clapper rail nest as follows:

> *A nest, built in the low littoral zone in a stand of tall dense cordgrass, constructed primarily of dead cordgrass stems. The platform of the nest is built up from the ground or supported in the cordgrass, the rim level as high as 45 centimeters off the ground. A canopy of live cordgrass stems is pulled over and entwined above the nest, hiding the nest completely from above. The surrounding tall cordgrass provides cover and also allows the nest to float upwards in place during a high tide. A ramp of dead cordgrass stems leads from the platform down and along the ground.*

On the Seal Beach NWR, where cordgrass stem heights are low and much of the Refuge's cordgrass habitat is almost completely submerged by the higher high tides, the probability of a natural nest surviving even moderately high tides in Anaheim Bay's primary salt marsh habitat is extremely low. The quality of the Refuge's low marsh habitat is compromised by local subsidence and low rates of sediment accretion (Takekawa et al. 2013a). A recently completed USGS study of local subsidence at the Refuge (Takekawa et al. 2013b) indicates that the marsh is experiencing relative sea level rise rates of over 6 millimeters per year. This condition has resulted in the need for creative solutions for maintaining a healthy breeding population of light-footed clapper rail on the Refuge.

One solution for addressing poor quality nesting habitat on much of the Refuge is the placement of artificial nesting platforms within the marsh. To date, approximately 95 artificial nesting platforms have been placed in the marsh for use by the rails. In 2012, when 87 nesting rafts were present in the marsh, monitoring during the breeding season

identified 27 light-footed clapper rail incubation nests. Another 32 rafts were used by the rails for brood nests. During the fall clapper rail count in 2012, 73 rails were observed on artificial nesting platforms. As of June 2014, 42 of approximately 95 artificial nesting platforms contained clutches.

Other management activities conducted on Seal Beach NWR to protect and assist in the recovery of the light-footed clapper rail include pre-season nesting preparation, monitoring during the nesting season, minimizing human disturbance, and implementing predator management. Pre-season nesting preparation involves surveying, maintaining, and replacing nesting platforms that have been installed in Anaheim Bay.

The Light-footed Clapper Rail Recovery Plan (USFWS 1985) includes the following recovery strategies specific to Anaheim Bay (Seal Beach NWR):

- Restore tidal action to surrounding uplands;
- Determine causes of elevational differences between Anaheim Bay and Upper Newport Bay, investigate feasibility of corrective actions;
- Develop fringing freshwater marsh and create nest hummocks;
- Enhance *Spartina* vigor;
- Control pollutants/debris;
- Identify and resolve water quality problems;
- Coordinate with vector control personnel;
- Establish and monitor permanent vegetation transects in Anaheim Bay; and
- Obtain information on the biology of the rail and its ecosystem to enhance recovery, including investigating factors limiting rail population size in Anaheim Bay.

The first known clapper rail count for the Refuge, which was conducted in the early 1970s, estimated that 100 to 200 individual birds were present in Anaheim Bay (Wilbur 1974). Annual counts on the Refuge began in 1979 and call counts conducted throughout the bird's U.S. range were initiated in 1980. Clapper rail monitoring on the Refuge is conducted in partnership with Naval Weapons Station Seal Beach and involves monthly monitoring of clapper rail nests during the breeding season, spring clapper rail call counts, and fall high tide call counts. Call count surveys are conducted once or twice annually during the breeding season to estimate the ratio of males to females and of paired to unpaired rails. High tide counts are conducted at least once annually in the fall during daytime +6.7 foot or higher tides. During these very high tides, rails are forced to seek higher ground, generally in pickleweed habitat or on nesting platforms, where they are easily visible to observers. These counts, which provide minimum population estimates, have been conducted since 1975. Annual monitoring reports are prepared to document the data and observations made during the year.

Breeding pair estimates for the Refuge between 1980 and 2012 are provided in Table 8.

Table 8 Number of Light-footed Clapper Rails Breeding Pairs at Seal Beach NWR, 1980-2012							
Year	**Breeding Pairs**		**Year**	**Breeding Pairs**		**Year**	**Breeding Pairs**
1980	30		1991	28		2002	24
1981	19		1992	36		2003	23
1982	28		1993	65		2004	16
1983	20		1994	66		2005	15
1984	24		1995	51		2006	24
1985	11		1996	52		2007	24
1986	5		1997	37		2008	17
1987	7		1998	16		2009	19
1988	7		1999	15		2010	25
1989	6		2000	10		2011	34
1990	16		2001	11		2012	42

Source: Hoffman 2012

California Least Tern (*Sternula antillarum browni*)
The California least tern is migratory, usually arriving at the Refuge in April and departing in August for the coast of Central or South America. Least terns are colonial but do not nest in as dense a concentration as many other tern species. The nest is a simple scrape or depression in the sand, in which one to four eggs are laid, usually two.

At Seal Beach NWR, the first eggs are generally laid in the second week of May and the last eggs are laid in late June (Collins 2007). Range wide, only one brood is raised; however, the birds will re-nest if eggs or chicks are lost. Parents continue to feed their young even after they are strong fliers. This tern species is an exclusive fish-eater, typically feeding on topsmelt, northern anchovy, gobies, and jacksmelt (Massey 1974, Atwood and Kelly 1984). Studies on fish dropped at nesting sites suggest that fish size, rather than species, is the essential requirement of suitable prey for the least tern.

At Seal Beach NWR, least terns currently nest on a peninsula referred to as NASA Island, a three-acre fill site that was converted from military use to a potential least tern nesting site between 1977 and 1979. Historically, California least terns foraged in Anaheim Bay and nested on the adjacent coastal beaches of Seal Beach and Sunset Beach (Collins 2007). Terns began nesting on NASA Island in 1979 and by 1998, approximately 165 breeding pairs were observed using the site.

The number of breeding pairs and the number of fledglings at NASA Island fluctuate in some years as a result of various factors including food supply and predation. The NASA Island nesting site is intensely managed immediately prior to and during the breeding season. These activities are often implemented and/or funded through a partnership with the Navy.

Eastern Pacific Green Sea Turtle (*Chelonia mydas*)
The eastern Pacific green sea turtle is one of six species of sea turtles found in the oceans in and around the United States. Populations of the eastern Pacific green sea turtle have

seriously declined due primarily to direct take of turtles and eggs. The Pacific green sea turtle was federally listed as threatened in 1978 throughout its Pacific Range, except for the federally endangered population nesting on the Pacific Coast of Mexico, which is covered under the Recovery Plan for the East Pacific Green Turtle (NOAA and USFWS 1998). Due to genetic testing results, the National Marine Fisheries Scientists believe that the majority of green sea turtles in southern California area are likely part of the federally endangered population that nests in Mexico (Dan Lawson pers. comm.).

In August 2007, researchers first observed eastern Pacific green sea turtles on the Refuge in the 7th Street Pond and in the associate feeder channel for this pond (Jirik and Lowe 2009). Multiple observations were made in these locations during August and September 2007, and June through October 2008. Observations were also made by the Refuge Manager in September 2009, June 2011, and during multiple months in 2012. Also in 2012, researchers from NOAA/NMFS and California State University Long Beach (CSULB) began a research project to tag and track turtles utilizing the Refuge as well as those in the nearby San Gabriel River. Early data confirmed that the turtles are moving between these two locations and generally do not use the Refuge waters during the colder winter months (Dan Lawson pers. comm.).

Speculation for why the sea turtles are present on the Refuge ranges from the presence of warm seawater temperatures in the mitigation ponds during the spring and summer to the availability of eelgrass and algae, which the sea turtle feed upon.

Western Snowy Plover (Pacific Coast Population) (*Charadrius alexandrinus nivosus*)
The Pacific Coastal population of western snowy plover is defined as those individuals that nest adjacent to or near tidal waters and includes all nesting colonies on the mainland coast, peninsulas, offshore islands, adjacent bays, and estuaries. The breeding range of this population of western snowy plover extends along coastal beaches from the southern portion of Washington State to southern Baja California, Mexico (USFWS 1993), and the breeding season extends from March 1 through September 15.

Some snowy plovers remain in their coastal breeding areas year-round, while others migrate south or north for the winter (USFWS 2007). Flocks of nonbreeding birds, consisting of a mixture of adult and hatching-year birds, begin to form along the Pacific coast in early July. During migration and winter, these flocks range in size from a few individuals to up to 300 birds. In the vicinity of the Refuge, near Huntington Beach and the Bolsa Chica wetlands, the numbers of wintering snowy plovers typically range from 30 to 60 individuals (USFWS 2007). A few individuals are also observed each year at Whiskey 8 Beach on the Naval Weapons Station during the winter count.

There are only a handful of snowy plover breeding locations currently used in southern California. Well used locations include Bolsa Chica (Orange County), Camp Pendleton, Batiquitos Lagoon, NAB Coronado, Silver Strand State Beach, Naval Radio Receiving Facility, and Tijuana Estuary in San Diego County.

The western snowy plover is only observed on the Refuge in very limited numbers and was not known to nest on the Seal Beach NWR until 2011, when one pair was found nesting on NASA Island. The three-egg nest hatched, but evidence indicated that the chicks were most likely depredated within the first week. No western snowy plovers were observed nesting on the Refuge in 2012, 2013, or 2014.

Belding's Savannah Sparrow (*Passerculus sandwichensis beldingi*)

The Belding's savannah sparrow (Belding's) is one of only two wetland-dependent avian species that reside year-round in the coastal salt marshes of southern California (Powell and Collier 1998). This salt marsh species is therefore reliant upon coastal salt marsh habitat for all of its life history requirements. This subspecies ranges along the southern California coast from Santa Barbara County (Goleta Slough) in the north to El Rosario, Baja California, Mexico in the south (James and Stadtlander 1991).

Belding's generally nests within dense stands of pickleweed. Breeding territories can be very small and the birds nest semi-colonially or locally concentrated within a larger block of habitat (Zembal and Hoffman 2002). Belding's savannah sparrows occur year-round on the Refuge, with relatively large numbers of territories documented annually around the marsh edges. During the April 2010 survey, 130 pairs of Belding's savannah sparrows were identified in the area of the Refuge located to the north of Bolsa Avenue. Twelve of these pairs were found in the pickleweed habitat occurring around the edges of the three islands in the Case Road Pond. Other areas of concentration included the edges of NASA and Hog Islands and the southeast corner of the Refuge, which was restored in 1980 (Zembal and Hoffman 2010). In 2010, the Refuge supported the second largest number of Belding's savannah sparrow territories in California.

Migratory Birds of Concern

The Refuge's bird populations can be divided into several broad categories according to when they are present. The greatest species diversity and overall bird abundance on the Refuge occurs when wintering birds (consisting primarily of shorebirds, waterfowl, and raptors) are present. The Refuge's tidal and intertidal habitats are important foraging and resting areas for these and other birds traveling along the Pacific Flyway. Shorebirds, generally the first to arrive, can be expected in August, with the first ducks generally following in September. Past observations indicated that peak bird abundance is typically observed from November through February. Those birds that choose to stay on the Refuge for the entire winter are generally present until April.

Another category of birds supported by the Refuge are migrant birds that use the wetlands as feeding and resting stops on their journeys between breeding and wintering grounds. Migratory birds moving south for the winter generally begin arriving at the Refuge in late summer, and are most abundant in the fall. Spring migration generally occurs from February through May for species heading north.

Table 9 lists the shorebirds, waterfowl, and other waterbirds identified as Birds of Conservation Concern or California Special Status Species that may be present in and around the project site during various times of the year.

Table 9 Birds of Conservation Concern and California Special Status Species with the Potential to Occur on or near the Pilot Project Site			
Common Name	**Scientific Name**	**Bird of Conservation Concern**	**California Special Status Species**
Birds			
Reddish egret	*Egretta rufescens*	yes	
Peregrine falcon	*Falco peregrinus*	yes	
Black oystercatcher	*Haematopus bachmani*	yes	
Lesser yellowlegs	*Tringa flavipes*	yes	
Whimbrel	*Numenius phaeopus hudsonicus*	yes	
Long-billed curlew	*Numenius americanus*	yes	
Marbled godwit	*Limosa fedoa fedoa*	yes	
Red knot	*Calidris canutus roselaari*	yes	
Dunlin	*Calidris alpina*	yes	
Short-billed dowitcher	*Limnodromus griseus*	yes	
Black skimmer	*Rynchops niger niger*	yes	yes
Redhead	*Aythya americana*		yes
Black brant	*Branta bernicla*		yes
Large-billed savannah sparrow	*Passerculus sandwichensis rostratus*		yes
American white pelican	*Pelecanus erythrorynchos*		yes
Reptiles			
Eastern Pacific green turtle	*Chelonia mydas*	n/a	yes
Plants			
Seablite	*Suaeda esteroa*	n/a	yes

Seablite (*Suaeda esteroa*)

Seablite, a California Special Status Species, occurs in various locations throughout the Refuge's salt marsh habitat, including at one location within the 16-acre Refuge site. During elevation surveys conducted throughout the Refuge by USGS, researches also noted plant species diversity and coverage at each survey point. During the survey, 56 survey points throughout the Refuge included seablite. One of the survey points was located within the 16-acre project site. Researchers estimated that seablite represented 15 percent of the plant coverage at this survey point. The survey point is located at the edge of the project site adjacent to the southern tidal channel. The average height of seablite at the survey point was 3 inches (8 centimeters [cm]), while the average height of seablite throughout the Refuge was 8 inches (20.4 cm). Extended periods of inundation may account for the lower heights of the seablite present within the Refuge project site (Morzaria-Luna et al. 2004).

C. Cultural Resources

Requirements for Federal agencies to identify, evaluate, and protect cultural resources are outlined in several Federal regulations, including the National Historic Preservation Act (NHPA) of 1966, as amended (PL 89-665; 50 STAT 915; 16 USC 470 et seq. 36 CFR 800). The NHPA sets inventory, nomination, protection, and preservation responsibilities for federally owned cultural properties and directs Federal agencies to take into account the effects of their actions on items or sites listed or eligible for listing in the NRHP. The criteria used to evaluate eligibility to the NRHP, as contained in 36 CFR 60.4, include, among others, consideration of the quality of the property's significance in American history, architecture, archaeology, and culture and the property's known or likely ability to yield information important in prehistory or history. An historical property must also retain the integrity of its physical identity that existed during the resource's period of significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association.

All accessible lands (dry land areas) within the Seal Beach NWR have been surveyed for cultural resources, and one site, CA-ORA-298, has been identified within the Refuge boundary. This site was previously evaluated and determined to be eligible for listing in the National Register of Historic Places (NRHP). Four additional cultural sites have been recorded just beyond the Refuge boundary within Naval Weapons Station Seal Beach. A record search of the California Native American Heritage Commission Sacred Land Files was conducted in 1993 by Ogden Environmental in association with the Historic and Archaeological Resources Protection Plan for the Naval Weapons Station Seal Beach. No sacred lands were identified.

D. Greenhouse Gas Emissions

According to EPA, a greenhouse gas (GHG) is any gas that absorbs infrared radiation in the atmosphere. This absorption traps heat within the atmosphere, maintaining the earth's surface temperature at a level higher than would be the case in the absence of GHGs. Increasing levels of GHGs resulting from human activities have increased levels of most of these naturally occurring gases in the atmosphere, which has and will continue to result in an increase in the temperature of the earth's lower atmosphere, a phenomenon that is commonly referred to as global warming. Warming of the earth's lower atmosphere induces a suite of additional changes, including changes in global precipitation patterns; ocean circulation, temperature, and acidity; global mean sea level; species distribution and diversity; and the timing of biological processes. These large-scale changes are collectively referred to as global climate change.

The GHGs listed by the Intergovernmental Panel on Climate Change (IPCC) include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6) (IPCC 2007). The State CEQA Guidelines contain a similar definition of GHGs (Health and Safety Code Section 38505(g); 14 CCR Section 15364.5). Water vapor, the most abundant GHG, is not included in this list because its natural concentrations and fluctuations far outweigh its human-made sources.

To simplify reporting and analysis, GHGs are commonly defined in terms of a global warming potential (GWP). The IPCC defines the GWP of various GHG emissions on a normalized scale that recasts all GHG emissions in terms of CO_2 equivalents (CO_2e). The GWP of CO_2 is, by definition, 1. GHG emissions are quantified and presented in terms of metric tons (MT of CO_2e emitted per year). The most recent GWPs from IPCC's Fifth Annual Assessment are used in this analysis.

Federal Regulatory Setting. Legislation has been enacted at the Federal level related to climate change. The following key pieces of legislation are applicable to the project:

> The updated Corporate Average Fuel Economy standards incorporate the stricter standards promulgated by the State of California into one uniform standard. In addition, automakers are required to cut GHG emissions in new vehicles by roughly 25 percent by 2016 and evaluate four potential future standards, ranging from 47 to 62 miles per gallon, by 2025. Under the Endangerment and Cause and Contribute Findings for Greenhouse Gases under Section 202(a) of the Clean Air Act, EPA finds that the current and projected concentrations of the six key well-mixed GHGs—CO_2, CH_4, N_2O, PFCs, SF_6, and HFCs—in the atmosphere threaten the public health and welfare of current and future generations. Under the Cause or Contribute Finding, EPA finds that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to GHG pollution that threatens public health and welfare. Under the authority of the CAA, EPA is beginning to regulate GHG emissions, starting with large stationary sources. In 2010, EPA set GHG thresholds to define when permits under the New Source Review Prevention of Significant Deterioration and Title V Operating Permit programs are required for new and existing industrial facilities. In 2012, EPA proposed a carbon pollution standard for new power plants.

California Regulatory Setting. A variety of legislation has also been enacted in California related to climate change, much of which sets aggressive goals for GHG reductions within the state. The following key pieces of legislation are applicable to the proposed project:

> Executive Order S-3-05 is designed to combat climate change by reducing California's GHG emissions to 1) 2000 levels by 2010, 2) 1990 levels by the 2020, and 3) 80 percent below 1990 levels by 2050. Note that executive orders are binding only on state agencies.
>
> Executive Order B-16-2012 is designed to guide state agencies' efforts to control and regulate GHGs even further. It establishes benchmarks for reducing transportation-related GHG emissions to 80 percent less than 1990 levels by 2050.
>
> Assembly Bill 32 (AB 32), the Global Warming Solutions Act of 2006, codified the state's GHG emissions targets, which are similar to the reduction goals in Executive Order S-3-05, while further mandating that ARB create a plan that includes market mechanisms and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases." Executive Order S-20-06 further directs state agencies to begin implementing AB 32, including the recommendations made by the state's Climate Action Team.

The AB 32 Scoping Plan contains the main strategies California will use to reduce GHGs from the “business as usual” (BAU) emissions projected for 2020 back down to 1990 levels. The Scoping Plan outlines how emissions reductions from significant sources of GHGs will be achieved through regulations, market mechanisms, and other actions. ARB is currently updating the scoping plan to include both a 2020 element and a post-2020 element. The 2020 element will focus on state, regional, and local initiatives that are being implemented now to assist in meeting the 2020 goal. The post-2020 element will provide a high-level view of a long-term strategy for meeting the 2050 GHG goals, consistent with the goals set forth in EO S-3-05 and EO B-16-2012. Senate Bill 1368 (Perata) prohibits any retail seller of electricity in California from entering into a long-term financial commitment for baseload generation if the GHG emissions are higher than those from a combined-cycle natural gas power plant.

Senate Bills (SBs) 1078/107/X 1-2 and Executive Order S-14-08 obligated investor-owned utilities, energy service providers, and community choice aggregators to procure an additional one percent of retail sales per year from eligible renewable sources until 20 percent is reached, no later than 2010. Executive Order S-14-08 set forth a longer range target of procuring 33 percent of retail sales by 2020. SB X 1-2, called the California Renewable Energy Resources Act, obligates all California electricity providers to obtain at least 33 percent of their energy from renewable resources by 2020.

The State CEQA Guidelines, as amended in 2010, require lead agencies to analyze a project’s GHG emissions. The guidelines confirm the discretion of lead agencies to determine appropriate significance thresholds but require the preparation of an EIR if “there is substantial evidence that the possible effects of a particular project are still cumulatively considerable, notwithstanding compliance with adopted regulations or requirements" (Section 15064.4).

Local Regulatory Setting**.** SCAQMD has primary responsibility for development and implementation of rules and regulations to attain the NAAQS and CAAQS as well as permitting new or modified sources, developing air quality management plans, and adopting and enforcing air pollution regulations within the Basin. The AB 32 Scoping Plan does not provide an explicit role for local air districts with respect to implementing AB 32, but it does state that ARB will work actively with air districts in coordinating emissions reporting, encouraging and coordinating GHG reductions, and providing technical assistance in quantifying reductions. The ability of air districts to control emissions (both criteria pollutants and GHGs) is provided primarily through permitting as well as through their role as a CEQA lead or commenting agency, the establishment of CEQA thresholds, and the development of analytical requirements for CEQA documents.

To provide guidance to local lead agencies regarding determining the significance of GHG emissions in their CEQA documents, SCAQMD is convening an ongoing GHG CEQA Significance Threshold Working Group. Members of the working group include government agencies that are implementing CEQA and representatives from various stakeholder groups that provide input to SCAQMD on developing GHG CEQA significance thresholds.

On December 5, 2008, the SCAQMD Governing Board adopted the staff proposal for an interim GHG significance threshold of 10,000 MT per year for industrial permitting projects where SCAQMD is lead agency. (Note: This threshold is not applicable to the proposed project.) The board letter, resolution, interim GHG significance threshold, draft guidance document, and attachments can be found under Board Agenda Item 31 on the December 5, 2008, Governing Board meeting agenda. No other quantitative thresholds have been developed by SCAQMD that would apply to the proposed project. In addition, the 2012–2035 Regional Transportation Plan/Sustainable Communities Strategy outlined SCAG's plan for integrating transportation and land use planning in response to projected growth, housing needs, changing demographics, and transportation demands in compliance with the GHG emissions-reduction goals set forth by ARB per SB 375 (SCAG 2012).

E. Hazards and Hazardous Materials

A hazardous material is defined as any material that, due to its quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or environment.

Hazardous materials include, but are not limited to, hazardous substances, hazardous wastes, and any material that a business or the local implementing agency has a reasonable basis for believing would be injurious to the health and safety of persons or harmful to the environment if released into the workplace or the environment.

Multiple State and local laws regulate the storage, use, and disposal of hazardous materials. The County of Orange Environmental Health Division was designated by the State Secretary for Environmental Protection on January 1, 1997, as the Certified Unified Program Agency (CUPA) for Orange County. The CUPA is the local administrative agency that coordinates the following six programs regulating hazardous materials and hazardous wastes: Hazardous Waste, Underground Storage Tanks (UST), Aboveground Petroleum Storage Tanks (APST), Hazardous Materials Disclosure (HMD), Business Plan, and California Accidental Release Program (CalARP).

Additionally, the Orange County Code of Ordinances provides regulations for the use and storage of hazardous materials. Section 3-3-14 of Chapter 27 requires the Orange County Fire Authority Chemical Classification packet to be completed and approved prior to approval of plans and/or the storage, use, or handling of chemicals on any premise. Pursuant to a database check with both the Geotracker (State Water Resources Control Board) and Envirostor (State Department of Toxic Substances Control) databases, the project site is not included on a list of hazardous material sites. There are no reported open hazardous materials sites within a 0.5-mile radius of the dredge site (DTSC 2013).

The Navy is responsible for the identification, assessment, characterization, and clean-up or control of contaminated sites within Naval Weapons Station Seal Beach, including the areas within the Seal Beach NWR that were contaminated prior to establishment of the Refuge. In 1985, an assessment of Naval Weapons Station Seal Beach, which included the Refuge, was conducted to identify sites posing a potential threat to human health or the environment that

might warrant further investigation. The assessment identified eight sites within the Refuge boundary (U.S. Navy 2007). To address these sites, which are referred to as "restoration sites," the Navy has established an Installation Restoration Program (IRP) that is administered by Naval Facilities Southwest Division with regulatory oversight provide by the California EPA Department of Toxic Substance Control and the California Regional Water Quality Control Board, Santa Ana RWQCB. The IRP addresses past releases of hazardous substances, pollutants, or contaminants that pose toxicological risk to human health or the environment. As of 2014, there are seven remaining sites in various stages of investigation and cleanup.

Of the sites identified through the IRP, remediation of four of the sites is the responsibility of the Navy. These sites, which are described in Table 10, include site 7, 40, 70, and 74. Remediation of site 22, Oil Island, is the responsibility of the facility operator, Breitburn Energy Corporation, and the responsible party for site 75 has yet to be determined and is under review (NAVFAC 2014).

The Navy also addresses environmental health and safety hazards from unexploded ordnance (UXO), discarded munitions, and munitions constituents through the Munitions Response Program (MRP). MRP Site UXO1 and MRP Site AOC2 have been documented within the Refuge boundary. MRP Site UXO1 includes 39 acres in the northern portion of 7th Street Pond located within the Refuge boundary, as well as 48 acres to the north of the 7th Street Pond, outside the Refuge boundary (ChaduxTt 2011). MRP Site AOC2, the site of the drop tower, was found to contain munitions debris during a 2009 survey, and soil samples indicated the presence of several constituents of concern, including five metals (i.e., cadmium, copper, lead, selenium, zinc) that exceeded the corresponding ecological benchmarks and background screening criteria (ChaduxTt 2011). Neither of these sites occurs in proximity to the 16-acre pilot project site.

Sediment Characterization. Sediment characterization and grain-size analysis has been conducted by OC Parks for the various sites proposed for maintenance dredging in the Harbour, as well as within the proposed pilot project site. The results of this work are summarized below and presented in detail in the Dredge Material Evaluation Sunset/Huntington Harbour Maintenance Dredging and Waterline Installation Project Sampling and Analysis Report (Kinnetic Laboratories, Inc. and Moffatt &Nichol 2014), which available for review upon request.

A total of 24 locations within the Harbour were sampled on January 6 and 7, 2014. Project depths vary throughout the Harbour and range from -8 feet to -16 feet MLLW. In addition to the Sunset/Huntington Harbour samples, samples for grain size and chemical analyses were collected from three locations in the pilot project site on the Refuge. One composite sample was physically, chemically (Tier II), and biologically (Tier III) analyzed for each Harbour area in addition to a composite sample from the pilot project site. No Tier III testing was performed on the pilot project composite sample.

Table 10 Summary of Installation Restoration Program Sites on Naval Weapons Station Seal Beach				
Site Number	**Description**	**Source of Contamination and Release Period**	**Waste Types**	**Current Status**
7	Station landfill located to the east of Perimeter Pond; 33-acre site located on and adjacent to the Refuge	Navy landfill used from mid-1950s - 1973	Trash, debris, solvents, oils, paint sludge, asbestos, mercury	Removal action implemented in 2004, semiannual landfill cover inspections and maintenance ongoing, continuing vegetative cover restoration
22	Oil Island, located in the southwest quadrant of Anaheim Bay, outside the Refuge boundary	Current commercial oil production area; waste holding impoundments in use in 1954; not from a Navy source	Drilling muds, oily wastes, drill cuttings	Removal action to clean up contaminated soil and groundwater is recommended; oil operator responsible for site management
40	Concrete pit/gravel area, located off the Refuge, west of the Refuge office	Engine work area and drainage, used 1940s – 1978	VOC groundwater plume; oil and chlorinated solvents	In-situ bioremediation, annual groundwater monitoring finalized in 2013, soil vapor sampling to be conducted in late 2014
70	Former NASA research, test, and evaluation site; located northeast of the Refuge, but plume extends into northern end of the Refuge	Manufacture of Saturn V launch Vehicle between 1962 and 1973	VOC groundwater plume	In-situ bioremediation initiated in 2010 and implemented again in 2013. Semi-annual monitoring in 2014
74	Former skeet range, located just south of the current small weapons range, western portion of the site within the Refuge boundary	Skeet shooting from the late 1960s – early 1990s	Lead, antimony, and PAHs	Cleanup process currently being evaluated; remedial action scheduled for FY15/16
75	Agricultural well; near the southeast corner of the Naval Weapons Station	Not from a Navy source	VOCs in groundwater	Working with regulatory agencies to identify the source
UST 8 (Bldg. 500)	Former underground storage tank site, located well to the east of Refuge	1200 gallon tank believed to be abandoned in the 1950s	Diesel fuel in the soil	Site characterization completed July 2014, recommending no further action

Source: (NAVFAC 2014)

Bulk sediment chemical analyses conducted on the Harbour Tier II composite samples and Refuge reference samples included total organic carbon (TOC), percent solids, metals, total ammonia, nitrate + nitrite total volatile solids (TVS), oil and grease, total recoverable petroleum hydrocarbons, total sulfides, water soluble sulfides, butyltins, chlorinated pesticides, pyrethroid pesticides, polychlorinated biphenyl (PCB) congeners, phenols, phthalates, polyaromatic hydrocarbons (PAHs), and polybrominated diphenyl ethers (PBDEs).

The main factors dictating suitability of placing Sunset/Huntington Harbour dredged sediments on the pilot project site are grain size, sediment contaminant levels, and sediment toxicity. A comparison of grain size distribution data from dredge site samples along with three samples collected within the proposed pilot project site indicate that grain sizes of the Tier II dredge composite samples are not substantially different from the existing sediments within the pilot project site. Of the sample areas, the Main Channel West dredge area was determined to be the most compatible with the existing Refuge sediments (Table 11).

Table 11
Comparison of Grain Size Data for Main Channel West and the Seal Beach NWR

% Grain Size Fraction	Tier II Composite Sample for Main Channel West	Seal Beach NWR Sample R1	Seal Beach NWR Sample R2	Seal Beach NWR Sample R3
Gravel	0	0	0	0
Sand	59	42	51	37
Silt	43	54	46	61
Clay	12	4.9	3.4	2.0

Source: Kinnetic Laboratories, Inc. and Moffatt &Nichol 2014

Chemical analysis of the Sunset/Huntington Harbour sediments indicated moderate contamination. Most sediment metal concentrations in the Sunset/Huntington Harbour Tier II composite samples were generally comparable to or less than soil background and Refuge reference concentrations. Copper, lead, and zinc do exceed background levels in some composite samples, but not in the Main Channel West composite sample. The report notes that copper and lead also exceed background concentrations in the pilot project reference sample and the zinc concentrations in the three Harbour composite samples were only slightly elevated (<8%) over the background concentration.

Contamination in the Sunset/Huntington Harbour sediments proposed for use on the Refuge pilot project site was not severe enough to cause any statistically significant suspended particular phase toxicity (using mussel larvae, mysid shrimp and fish) or benthic toxicity (using amphipods and polychaete worms). There was statistically significant bioaccumulation of lead, DDTs, chlordane and PCBs in the test tissues. However, levels were determined to represent minimal threat to benthic organisms or species foraging in the marine benthic environment of the Refuge. Therefore, impacts from contaminants associated

with placement of the dredged sediments to the benthic community or organisms dependent upon it at the Refuge site are not anticipated.

F. Water Quality

Water quality in intertidal wetlands is influenced by the level, range, and/or timing of water temperature, salinity, pH, nutrients, oxygen availability, and turbidity, as well as the frequency and timing of tidal mixing and flushing (U.S. Navy 2014). The ebb and flow of the tides within Anaheim Bay circulate and mix ocean and salt marsh waters, and transport nutrients and organisms in and out of the system. The tides produce currents, induce small, localized changes in salinity, and alternately expose mudflats and adjacent shorelines. Tidal flushing is an important factor in dispersing pollutants, maintaining water quality, and moderating water temperature.

In an unaltered salt marsh system, salinity in the marsh can vary significantly depending upon the amount of freshwater that flows into the marsh during storm events. The system in Anaheim Bay has been disturbed to the point that the flow of freshwater into this marsh is extremely limited, which results in salinity levels comparable to ocean water, higher than can normally be found in other marshes along coastal southern California.

Unlike the salt marsh habitat in Anaheim Bay, Huntington Harbour does receive stormwater flows from storm drainage systems that direct runoff generated upstream of the Refuge through flood control channels that extend around the marsh and empty into the Bay near the entrance to Huntington Harbour. The water body comprising the open bay portion of Anaheim Bay and Huntington Harbour is referred to as the Anaheim Bay/Huntington Harbour complex by the State Water Resources Control Board. Anaheim Bay is included on the State's 303(d) list of impaired water bodies for polychlorinated biphenyls (PCBs), sediment toxicity, and heavy metals (Nickel). Huntington Harbour is on the 303(d) list for pathogens, metals (Copper, Lead, and Nickel), PCBs, sediment toxicity, and pesticides (Chlordane) (California State Water Resources Control Board 2011).

The Santa Ana Water Board has adopted a basin plan for its region of responsibility, which includes the Anaheim Bay/Huntington Harbour complex. The basin plan contains water quality objectives, including development of numeric Total Maximum Daily Loads (TMDLs) for the 303(d) listed impairments. The TMDL is the total amount of a constituent that can be discharged while meeting water quality objectives and protecting beneficial uses. Because the Huntington Harbour is impaired, project-specific water quality plans (such as a Water Quality Management Plan) would be required by the Santa Ana Water Board to meet the TMDL requirements of this water body.

G. Noise

Noise generated during the transport of the dredge material from the Main Channel West dredge site to the pilot project site is subject to the policies and standards contained in the noise element and noise ordinance of Orange County. The County's noise ordinance exempts construction activities from the noise standard (provided that such activities take place between the hours of 7 a.m. and 8 p.m. on weekdays and Saturdays). With respect to the site

proposed for sediment augmentation, sensitive receptors (e.g., developed areas) occur at least 0.5 miles beyond the boundaries of the project site.

6. Environmental Consequences

The discussion included in this section, as well as the issues addressed in the Initial Study Checklist (Appendix A), provide information needed for making informed decisions on the proposed project. Only those issues that are potentially affected by the proposed project are discussed in detail in this section. The Initial Study Checklist (Appendix A) provides documentation of our consideration of all potential environmental effects resulting from the proposed project. The direct and indirect effects of the proposed action, as well as the no action alternative, are analyzed below. Cumulative environmental consequences of implementing the proposed action and no action alternatives are addressed in Section 7 of this document.
The analysis provided in this section tiers from the programmatic EA that was prepared in conjunction with the Seal Beach NWR CCP. The EA is incorporated by reference into this document. The potential environmental effects of the larger OC Parks maintenance dredging project are summarized here and described in detail in the Sunset/Huntington Harbour Maintenance Dredging and Waterline Installation Project Draft IS/MND, which is incorporated by reference into this document.

A. Air Quality

Thresholds of Significance

Appendix G, Section III of the Environmental Checklist form in the State CEQA Guidelines, states that, where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make determinations regarding air quality impacts. Because of SCAQMD's regulatory role in the Basin, the significance thresholds and analysis methodologies outlined in its CEQA Air Quality Handbook, Localized Significance Threshold Methodology for CEQA Evaluations, and Particulate Matter (PM) 2.5 Significance Thresholds and Calculation Methodology guidance documents were used in evaluating project impacts. Note that localized significance thresholds (LSTs) are based on the size or total area of the emissions source, the ambient air quality in each SRA where the emission source is located, and the distance to the sensitive receptor. The LSTs used herein are based on the project area potentially disturbed on any given day (1 acre), the project location (SRA 18, North Orange County Coastal), and the distance to the nearest sensitive receptor (25 meters).

Impact Analysis for the Proposed Action

The SCAQMD construction emissions thresholds previously presented in Table 4 are used for this assessment. SCAQMD operational emissions thresholds are not considered as the proposed pilot project will result in no operational changes. The air quality effects of the OC Parks maintenance dredging project are addressed in the OC Parks IS/MND, and will occur with or without the implementation of the proposed pilot project.

Transport and application of the sediment onto the pilot project site is expected to take between four to six weeks depending upon the application techniques that are used. These activities will result in the short-term generation of criteria pollutant and TAC emissions. Construction emissions associated with the delivery and application of up to 13,500 CY of dredged sediments from the Main Channel West site to the Refuge's pilot project site could be generated from several potential sources, including:

- the operation of one to two small boats used for monitoring construction activities;
- the operation of a small boat to install a floating pipeline from the dredge site to the application site, or the operation of a small containment barge and booster pump to transport and apply sediment from the dredge site to the application site; and
- vehicle trips by construction workers and site monitors.

The emissions calculations associated with workboats, a small containment barge, and a booster pump are based on horsepower and anticipated duration of use. If a pipeline is used to transport sediment from the dredge site to the Refuge site, the emissions associated with the Refuge pilot project would be generated by a workboat that would be needed to distribute sediment on to the site via the pipeline, another smaller boat that would be used by onsite monitors, and daily worker trips to and from construction site. The engines used in each type of boat were assumed to be no larger than 50 horsepower (hp). If material were to be transported to the pilot project site by a small containment barge, emission would be generated by the barge's 500 hp engine and a 500 hp generator that would be needed to pump the slurry from the barge onto the pilot project site.

In estimating the emissions associated with worker commutes, it was assumed that there will be 12 worker trips per day (six employees, two trips per employee). Based on the CalEEMod default for a home–work commute in urban Orange County, total trip length was assumed to be 12.7 miles. Emissions associated with worker commutes are based on the annual average emission factors for light-duty automobiles and trucks from EMFAC2011.

Anticipated emissions associated with the implementation of the pilot project are presented in Table 12 at the daily time scale.

Table 12
Estimate of Unmitigated Regional Construction Emissions Associated with the Implementation of the Pilot Project[1]

	Emissions (Pounds per Day)					
	VOC	**CO**	**NO_X**	**SO_2**	**PM10**	**PM2.5**
Workboats	1	4	6	0	0	0
Containment Barge (500 hp)	0.78	3.05	10.36	0.01	0.30	0.28
Booster Pump (500 hp)	1.3	6	16	0	0.5	0.5
Worker Commute	0	1.4	0.2	0	0.2	0
Total	**3.08**	**14.45**	**32.56**	**0.01**	**1.0**	**0.78**
SCAQMD Regional Construction Thresholds	*75*	*550*	*100*	*150*	*150*	*55*
SCAQMD Localized Construction Thresholds	*n/a*	*647*	*92*	*n/a*	*4*	*3*
Exceedance of Threshold	*No*	*No*	*No*	*No*	*No*	*No*

[1]Assumes the use of a containment barge and booster pump. Use of a floating pipeline from the dredge site to the pilot project site would result in fewer emissions.

Fugitive dust emissions were assumed to be negligible during transport and application of the dredge sediments. Dredged materials will be saturated and most likely will not generate dust during dredging or during placement.

An estimate of total direct and indirect emissions generated by the implementation of the pilot project is presented in Table 13 to determine conformity with Rule 1901 of the AQMD regulations.

Table 13
Estimate of Unmitigated Regional Construction Emissions over the Duration of the Sediment Augmentation Project[1]

	Emissions (tons)					
	VOC	**CO**	**NO_X**	**SO_2**	**PM10**	**PM2.5**
Workboats	0.023	0.09	0.135	0	0	0
Containment Barge	0.018	0.07	0.23	0	0.007	0.006
Booster Pump	0.03	0.14	0.36	0	0.01	0.01
Worker Commute	0	0.032	0.005	0	0.005	0
Total	**0.071**	**0.332**	**0.73**	**0**	**0.022**	**0.016**
Rule 1901Conformity Applicability Threshold	*25*	*100*	*25*	*100*	*n/a*	*100*
Exceedance of Threshold	*No*	*No*	*No*	*No*	-	*No*

[1] Assumes 45 days for sediment transport and application, and the use of a containment barge and booster pump. Use of floating pipeline from the dredge site to the pilot project site would result in fewer emissions.

Compatibility with Applicable Air Quality Plan. The proposed action is a short-term project that will generate emissions below regional and localized SCAQMD thresholds, and will result in no changes in existing land use and no increases in population or employment following project completion. As a result, the implementation of the proposed action will not conflict with any air quality management plan, and impacts are considered less-than-significant.

Consistency with Adopted Air Quality Standards. Under the proposed sediment augmentation project, up to 13,500 CY of sediment from the OC Parks Sunset/Huntington Harbour maintenance dredging project will be disposed of near the dredge site, slightly reducing the emissions that would result from transporting the material a great distance either to LA-2 or to an inland site.

Implementation of the pilot project will not exceed SCAQMD Regional Construction Thresholds or SCAQMD Localized Construction Thresholds, nor will it exceed the Rule 1901Conformity Applicability Thresholds, therefore, air quality impacts are considered less-than-significant and no mitigation is required.

Exposure to Sensitive Receptors. Although the proposed project will contribute to localized air pollutant emissions during short-term construction, implementation of the project alone is not anticipated to result in an elevated health risk to persons who may be exposed to construction related diesel fumes. SCAQMD does not consider diesel-related cancer risks from short-term use of construction equipment to be an issue (OC Parks IS/MND).

Construction activities associated with the proposed project will be short in duration (four to six weeks) and will occur a sufficient distance from sensitive receptors that implementation of the pilot project is not anticipated to result in an elevated health risk to exposed persons. In addition, the project will not create substantial pollutant concentrations of criteria pollutants. The potential for impacts to sensitive receptors as a result of project implementation are therefore considered less than significant.

Objectionable Odors. The sediment to be dredged from the Main Channel West site is likely to contain organic materials that have the potential to generate objectionable odors, but any exposure would be brief and limited to the area immediately surrounding the dredging activities. Application of this material onto the Refuge site will be via mix of sediment and water, which will dilute any odors generated by the sediment. In addition, the application site is not located in proximity to any sensitive receptors. As such, no impacts related to odor are anticipated.

Impact Analysis for the No Action Alternative

Under the no action alternative, no sediment from the maintenance dredging project would be transported to and disposed of on the Refuge site. Therefore, emissions associated with transport of material to the site and boats used for monitoring would not be generated. However, it would still be necessary for OC Parks to dispose of the material that would have been used for the pilot project; therefore, even under the no action alternative, there would be emissions associated with transport of those same sediments to an alternative disposal site.

Compatibility with Applicable Air Quality Plan. A decision not to implement the proposed action would have no effect on the applicable air quality plan.

Consistency with Adopted Air Quality Standards. Under the no action alternative, the emissions generated from the transport and application of sediment to the pilot project would not occur. Therefore, this alternative would have no effect on adopted air quality standards.

Exposure to Sensitive Receptors. There would be no change in the potential for exposure of emissions to sensitive receptors under the no action alternative, as emissions to be generated by the disposal of sediment onto the Refuge site would be minimal.

Objectionable Odors. No objectionable odors would be generated under the no action alternative.

B. Biological Resources

Thresholds of Significance

A significant impact on biological resources may result from a project that has the potential to substantially modify habitat identified as necessary to support a species or suite of species identified as species of concern in State, Federal, local, or regional plans, policies, or regulations, or would result in a “taking” of a species listed, or proposed for listing, or a candidate for listing under the State and/or Federal Endangered Species Act,

or protected by the Migratory Bird Treaty Act, or otherwise considered to have a special status in local or regional plans, policies, or regulations.

Impact Analysis for the Proposed Action

The proposed action has the potential to affect 16 acres of low salt marsh habitat on the Seal Beach NWR. Within the 16-acres, approximately 10 acres will be modified through the application of 6 to 10 inches (15 to 25 cm) of sediment over the existing vegetation. The remaining six acres of vegetated salt marsh will provide a sediment trap for sediments that might flow from the 10-acre application site. As a result, the salt marsh vegetation in this area could experience some increase in sediment levels.

As described previously, habitat quality on the site under existing conditions has been reduced to the point that the site no longer supports natural nesting habitat for the light-footed clapper rail. Prolonged immersion of the site during high tides is considered the primary cause for reduced plant vigor, including reduced cordgrass height and density (Massey et al. 1984). Plant vigor is expected to improve as a result of raising the elevation of site.

This thin-layer of sediment will cover some but not all of the vegetation on the site. Cordgrass stem height on the 16-acre site, as measured in 2011, averaged 43.2 cm and ranged from 34 to 72 centimeters. Therefore, the upper stems of the cordgrass will remain exposed. Pacific pickleweed will be affected in a similar manner. The other salt marsh plant species present on the site could be partially or fully covered by the sediment depending upon the height of the individual plants.

Based on the results of similar projects conducted in coastal salt marsh habitat along the Gulf and East Coasts (Ray 2007, Slocum et al. 2005, Ford et al. 1999), reestablishment of salt marsh vegetation at the pilot project site is expected to occur as existing plants grow up through the layer of new sediment and other low salt marsh vegetation reestablishes through natural recruitment from adjacent seed sources. It is anticipated and is a goal of the pilot project that the species composition in the 10-acre application site will change during the reestablishment period to favor increases in cordgrass stem terminal heights.

Slocum et al. 2005 postulates that sediment slurry enrichment increases salt marsh plant vigor by increasing both elevation and soil bulk density. Although thin-layer sediment augmentation has been proven successful elsewhere (Ray 2007), these projects were conducted where smooth cordgrass (*Spartina alterniflora*) is present. No thin-layer sediment augmentation studies have been conducted on Pacific cordgrass.

Although limited, there is some discussion of natural Pacific cordgrass recruitment in the literature. Ward et al. 2003 describes the establishment of Pacific cordgrass on a 6.5-hectare mudflat in Tijuana Estuary following sedimentation from winter storms. Initial establishment occur as seedlings in 1993, and by 1997, over 80 new clones were counted.

Year 2 post-construction monitoring results for the South San Diego Bay Coastal Wetland Restoration and Enhancement Project (Nordby Biological Consulting and Tijuana River

National Estuarine Research Reserve 2014) indicate that some transplanted Pacific cordgrass rhizomes that displayed no survival success the first year did develop above ground plant coverage in year 2. The report states, "Transplanted cordgrass rhizomes frequently survive below ground while above ground biomass appears dead or has decomposed . . . [these rhizomes] subsequently support aerial shoots one or more growing seasons afterward."

The Refuge currently supports approximately 565 acres of salt marsh vegetation; the proposed pilot project has the potential to modify approximately 2.8 percent of the total salt marsh habitat on the Refuge. The impacts are expected to be temporary (two to five years). An important component of the pilot project is monitoring how the salt marsh vegetation and other organisms react to the application of the sediment and the increase in the elevation of the marsh plain. If the marsh responds as predicted, additional sediment augmentation within the Refuge would likely occur in the future in an effort to support the recovery of the light-footed clapper rail and improve the habitat quality of the Refuge's low salt marsh vegetation.

Although the project is intended to benefit salt marsh habitat and will affect only a small area of salt marsh habitat, failure of the site to revegetate as predicted would represent a significant adverse effect unless adequate mitigation measures are implemented to reduce the impacts to below a level of significance. To avoid adverse effects to salt marsh habitat, the project scope includes a proposal to reestablish salt marsh vegetation on the site if after five years following sediment application, salt marsh vegetation has not returned to conditions at least similar to those present within the project site prior to sediment application. Site management and monitoring will continue until salt marsh vegetation is restored to pre-project conditions. Mitigation Measure BIO-1 will ensure that potential impacts to salt marsh vegetation will be mitigated to less-than-significant.

> **Mitigation Measure BIO-1:** If, within five years of sediment application, reestablishment of the native salt marsh vegetation community to a density and percent cover similar to that present within the project site prior to sediment application has not occurred, the Refuge shall develop and implement a restoration plan to reestablish native salt marsh vegetation at densities and a percent cover similar to pre-project site conditions. Site management and monitoring shall continue until salt marsh vegetation has been restored to the site in accordance with the specifications of the restoration plan.

Construction related disturbance on the Refuge will occur for a period of from four to six weeks. To avoid impacts to nesting birds, no construction will be permitted during the nesting season. Further, construction is scheduled to occur in late fall or early winter when water temperatures are cooler, reducing the potential for the presence of sea turtles in the project area. Mitigation Measure BIO-2 will ensure that adverse effects to wildlife will be minimized.

> **Mitigation Measure BIO-2:** A qualified biologist shall be on site during construction activities to monitor for the presence of wildlife and sensitive species in particular. The biologist shall have the authority to halt construction when wildlife is observed within or near the sediment application site. Work crews will be briefed on how to identify sea turtles and marine mammals that are expected to occur within and around the pilot project area. The biological monitor will prepare incident reports of any observed sea turtle

activity and shall provide such reports to NMFS within 24 hours of an observation. Any work vessels (e.g., containment barge, workboat) moving about the project site, including from the dredge site and within the adjacent tidal channels, shall comply with a five-mile per hour (mph) speed limit. In the event of a collision between the containment barge or workboat and a marine mammal or sea turtle, the Service shall immediately contact the NMFS Southwest Regional Office's Stranding Coordinator, and submit a report to the NMFS within 24 hours. To reduce the potential for sea turtles to be present in the area during project implementation, sediment transport and application within the Refuge shall only occur within the timeframe of November 1 to February 15, when water temperatures are generally lower than other times of the year.

The tidal channels located adjacent to the application site support eelgrass habitat. The introduction of sediment and/or increased turbidity within these channels could have an adverse effect on eelgrass. To minimize the potential for sediment to move off the site, a vegetated buffer will be maintained around the 10-acre application site, and the area will be monitored during sediment application. If necessary, additional measures will be implemented, including the installation of silt fencing or other forms of sediment control.

Eelgrass surveys will be conducted in the tidal channels prior to and following sediment application to determine if eelgrass has been adversely affected during sediment transport to the site and/or from any sediment that migrates from the site into the tidal channels during application. Pre- and post-application surveys will also document habitat conditions at a reference site elsewhere on the Refuge in order to compare data to a site unaffected by project implementation. The reference site and a potential restoration site, should one be required, will be determined in consultation with NOAA's National Marine Fisheries Service (NMFS) during the required consultation related to Essential Fish Habitat.

Any loss of eelgrass associated with project implementation will require conformance with the Southern California Eelgrass Mitigation Policy (SCEMP). Provisions of the SCEMP require that any impacts to eelgrass be mitigated in a manner that compensates for direct habitat loss and loss of functions while mitigation habitat is becoming established. The SCEMP also requires monitoring of mitigation areas and suitable local reference sites for a period of five years to assess mitigation site performance against that of a natural reference bed.

Mitigation measure BIO-3 will ensure that any impacts to eelgrass will be mitigated to below a level of significance.

Mitigation Measure BIO-3: Eelgrass surveys shall be conducted within the tidal channels that abut the 16-acre pilot project site and at an appropriate reference site no more than 120 days before proposed sediment application, and again after sediment application is completed. If habitat impacts associated with the project are identified, compliance with the SCEMP shall be initiated and yearly monitoring reports shall be filed with resource agencies and the California Coastal Commission.

The implementation of measures to protect and if necessary restore eelgrass within the tidal channels located adjacent to the pilot project site, will ensure that no adverse effects to fisheries within Anaheim Bay will occur as a result of sediment augmentation.

The monitoring component of the pilot project has the potential to result in trampling of salt marsh vegetation and disturbance to avian species. Monitoring will require visual and physical access to the site both before and after sediment augmentation. Most monitoring activities will occur on an annual basis and will require a presence on the project site for period of one to two days for most activities, but up to a week for more site intensive study such as elevation and vegetation surveys. Should clapper rails nest naturally within the project area during the five-year monitoring effort, any work near the nests, with the exception of clapper rail nest surveys, will be avoided during the breeding season (March 1 to September 15). Because of the limited presence of monitors within the site during the course of year and the avoidance of the area during the breeding season for all by clapper rail nesting surveys, the potential for adverse effects to sensitive vegetation and avian species will be less than significant.

With respect to listed and sensitive species, the application of sediment onto 10 acres of the 16-acre pilot project site could result in direct and indirect impacts to the light-footed clapper rail. No natural nesting of clapper rails occurs within the project site due to the limited height of the existing cordgrass and the extent of inundation experienced at this location. The site also offers limited cover to protect the rails from predation. During lower tides, the site does provide the rails with foraging opportunities. These foraging opportunities will be eliminated for up to two years. The temporary loss of foraging habitat is a small portion (2.8 percent) of the total foraging habitat available for rails on the Refuge; therefore, this temporary loss will not represent a significant adverse effect to rails.

There are currently three artificial nesting platforms (115, 117, and 132) anchored within or adjacent to the 16-acre project site (refer to Figure 5). Two of these platforms, 115 and 117, were used for nesting during the 2014 nesting season, although the nest on platform 115 was depredated and therefore unsuccessful. (Not all of the 95 platforms are occupied in given year.) To ensure that rails are not using the area during sediment application, the three nesting platforms will be removed following the end of the clapper rail nesting season.

Disturbance during sediment application could also result in the relocation of avian species of concern to other areas of the Refuge. Because the affect is short term and the area to be impacted is very limited in size, disturbance and the temporary loss of foraging habitat will not represent a significant adverse effect to avian species.

To avoid any direct take of rails or other avian species during project implementation, Mitigation Measure BIO-4, presented below, will be implemented. Implementation of this measure will reduce any potential adverse impacts to rails and other avian species to less-than-significant levels.

Mitigation Measure BIO-4: To avoid the presence of light-footed clapper rails in the vicinity of the project during sediment application, prior to sediment application, the three artificial light-footed clapper rail nesting platforms located within and adjacent to the project site shall be temporarily removed after the end of the 2014 breeding season (after September 15). In addition, prior to the daily application of sediment onto the pilot project site, a qualified biologist shall survey the 16-acre site and surrounding areas for the presence of rails. If any are present, an air horn or cracker shells will be deployed to move the birds off the site prior to sediment application. If noise proves ineffective, physical presence may be used to haze birds to move to the other parts of the Refuge. Also, monitoring shall continue throughout the day to discourage clapper rails from moving into the project site, particularly during periods when sediment is not being sprayed, such as during breaks or when adjustments in the application process are being implemented. If sediment is applied using the "rainbow" method of spraying in the air as opposed to spreading the slurried material on the ground from a pipe, efforts shall be made to haze (through noise or physical presence) other avian species out of the impact area prior to each application interval.

No impacts to the California least tern are anticipated, as this species is not present on the Refuge in November through January when the project will be implemented.

Seablite, a California Special Status Species, is located at the edge of the project site adjacent to the southern tidal channel. Based on its location, this population of seablite will be included within the proposed vegetative buffer, and will likely experience minimal disturbance due to the project. Because this occurrence of seablite is limited to a small area of the project site and seablite, a short-lived species, recruits in disturbed areas through the dispersal of seeds, disturbance or loss of the existing specimens of seablite within the project site will not represent a substantial loss of the species within the Refuge. In addition, research on recruitment of various marsh species in southern California marshes indicates that seablite really recruits in disturbed areas where a seed source is available to support recruitment (Lindig-Cisneros and Zedler 2002, Morzaria-Luna et al. 2004), therefore, natural recruitment of this species onto the project site is likely to occur within one or two years of sediment application. Impacts to seablite will be less-than-significant.

Placement of a pipeline in the open waters of the bay to transport the sediment to the site from the Main Channel West and/or use of a containment barge in the main tidal channels on the Refuge could adversely affect eelgrass and sea turtles. In addition, increased turbidity or sediment movement from the application site into the adjacent tidal channels could adversely affect the extent and/or quality of the eelgrass beds present in these tidal channels. Implementation of Mitigation Measure BIO-3 will reduce potential adverse impacts on eelgrass to less-than-significant, and the implementation of Mitigation Measure BIO-2 will reduce potential adverse impacts sea turtles and other sensitive marine species to less-than-significant.

The proposal to apply a thin-layer of sediment over existing coastal salt marsh habitat is expected to result in temporary impacts to the site's coastal salt marsh ecosystem, with the ultimate goal of enhancing the habitat quality for light-footed clapper rails and other

organisms supported by coastal salt marsh. Because the effects of the project will be temporary and will affect less than 2.8 percent of the total salt marsh habitat within the Refuge, the temporary loss of habitat function in this portion of the Refuge is considered less-than-significant.

Cordgrass and other coastal wetland plants that are currently present on the site are expected to grow up through the sediment or reestablish via vegetative or seed recruitment within a period of two years. Pre and post-application monitoring of the physical and biological responses of the site to sediment application are an integral part of the overall project design. If after five years of monitoring, reestablishment of vegetation to conditions similar to those present within the designated reference site has not occurred and project impacts are therefore considered long-term, the implementation of Mitigation Measure BIO-1 will reduce potential adverse impacts to less-than-significant levels.

Eelgrass, a sensitive natural marine vegetation community, could also be adversely affects by sediment application on the project site. Potential impacts to this community are expected to be less than significant with the implementation of Mitigation Measure BIO-3.

Impact Analysis for the No Action Alternative

The potential for impacts to biological resources from the maintenance dredging project, which would be implemented with or without the Refuge's sediment augmentation component, would be identical to those addressed above. The implementation of mitigation measures would reduce potential impacts to a less-than-significant level. As no activities would be proposed on the Refuge under the no action alternative, there is no potential for adverse effects to biological resources.

C. Cultural Resources

Thresholds of Significance

A significant impact to cultural resources may result from a project that has the potential to:

- Alter (e.g., cause the adverse physical or aesthetic effects and/or the destruction of) a prehistoric or historic building (including an architecturally significant building), structure, object, or site;
- Cause a substantial adverse change in the significance of a historical or unique archaeological resource;
- Impact existing religious or sacred uses; or
- Disturb any human remains, including those interred outside of formal cemeteries.

Impact Analysis for the Proposed Action

Effects on Significant Historical and/or Archaeological Resources. To avoid adverse effects to cultural resources, when a project is first being considered for implementation that would require ground disturbance, Refuge staff submits a Request for Cultural Resource Compliance to the Service's Cultural Resources Program. The Request includes a map,

indicating the APE for the project site and any associated access requirements that may involve grading, along with a detailed project description. Based on this information, Cultural Resource staff will determine the appropriate measures to be implemented to protect cultural resources. It may be determined that the action is a routine undertaking that would have little or no potential to affect historic or archaeological properties. In this case, the action would fall under the terms of the Service's Programmatic Agreements (PA) with the State Historic Preservation Office (SHPO) and the Advisory Council for Historic Preservation (Council) regarding the administration of routine undertakings under the NHPA in the states of California, Idaho, Nevada, Oregon, and Washington.

Through the PA, the Service has identified a process to review how routine undertakings may fall under the terms of the PA's Appendix A or Appendix B. Appendix A projects are defined as those "types of undertakings requiring consultation with the Regional Archaeologist/Historic Preservation Specialist (Specialist) and otherwise excluded from case-by-case review and consultation with the SHPO and requiring no cultural resource identification effort." Appendix B projects are those "requiring consultation with the Regional Archaeologist/Historic Preservation Specialist and otherwise excluded from case-by-case review and consultation with the SHPO but will be subject to a cultural resource identification effort."

Projects that fall under Appendix A can be cleared by the Specialist with a memo and the project can proceed. A project determined to fall under Appendix B requires field reconnaissance. If no historic properties are identified, the Specialist or archaeologist approved by the Specialist can issue clearance and the project can proceed. The Specialist subsequently completes an Appendix B Short Report for the project. All clearances include the stipulation that if cultural resources are discovered during the project, work will halt and the Service's Regional Archaeologist shall be contacted.

The Service's Regional Cultural Resources Team submits an annual report to the SHPO and the Council documenting the number and types of undertakings excluded from case-by-case review under the terms of Appendix A and Appendix B.

An Appendix A determination has been made for the Service's sediment augmentation project. This determination indicates that the Service has evaluated the potential impact of the proposed project on cultural resources and no impacts are anticipated. No further cultural resource identification effort is necessary for the project. In compliance with the terms of the PA, the project will be reported to the SHPO in the annual report, prepared and submitted at the end of fiscal year 2014.

The existence of cultural resources can never be predicted with certainty; therefore, the implementation of Mitigation Measure CR-1 will ensure that potentially significant impacts resulting from the encounter of an archaeological resource will be reduced to a level below significance.

Mitigation Measure CR-1: In the event that cultural resources are discovered during any disturbance to subsurface material on the 16-acre pilot project site, the ground disturbing activity shall be halted, the Service's Regional Archaeologist shall be notified, and additional consultation shall be initiated to ensure compliance with the NHPA and other applicable Federal regulations and policies.

Effects on Unique Paleontological Resources. No substantive excavation or digging is proposed on the 16-acre pilot project site; therefore, no impacts to paleontological resources will occur.

Impact Analysis for the No Action Alternative

Under the no action alternative, sediment would not be applied to the project site and no other actions would be taken at that site that would result in a potential for adverse effects to cultural or paleontological resources.

D. Greenhouse Gas Emissions

Thresholds of Significance

Appendix G, Section III of the Environmental Checklist form in the State CEQA Guidelines, states that, where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make determinations regarding air quality impacts. State CEQA Guidelines Section 15064.4 provides guidance to lead agencies for determining the significance of impacts from GHG emissions, and Section 15064.4(a) provides that a lead agency should make a good-faith effort, to the extent possible, based on scientific and factual data to describe, calculate, or estimate the amount of GHG emissions resulting from a project. State CEQA Guidelines Section 15064.4(b) also provides that, when assessing the significance of impacts from GHG emissions, a lead agency should consider (1) the extent to which the project may increase or reduce GHG emissions compared with existing conditions, (2) whether the project's GHG emissions exceed a threshold of significance that the lead agency determines applicable to the project, and (3) the extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.

The State CEQA Guidelines do not provide numeric or qualitative thresholds of significance for evaluating GHG emissions. There are currently no adopted quantitative thresholds relevant to the project. SCAQMD has adopted a 10,000 MT significance threshold level for industrial facilities where SCAQMD is the lead agency. However, this 10,000 MT significance threshold level is not applicable to the proposed project because the project is not an industrial facility. Although SCAQMD has drafted a 3,000 MT significance threshold level for commercial/residential projects, no threshold has been proposed or adopted for construction or public works projects (SCAQMD 2008). Other quantitative thresholds have been adopted or recommended by other public agencies, including other air districts, or recommended by experts throughout the state, such as the 900 MT threshold level contained within California Air Pollution Control Officers Association's (CAPCOA's) CEQA and Climate Change Report (CAPCOA 2008) and

thresholds adopted in statewide jurisdictions throughout the state. CAPCOA's 900 MT threshold level is the lowest quantitative threshold within the state. Thus, for purposes of this analysis, both direct and indirect GHG emissions from the project are discussed in regard to CAPCOA's 900 MT threshold level. Note that GHGs and climate change are exclusively cumulative impacts; there are no non-cumulative GHG emission impacts from a climate change perspective (CAPCOA 2008). Therefore, in accordance with scientific consensus regarding the cumulative nature of GHGs, the analysis herein analyzes the cumulative contribution of project-related GHG emissions.

Impact Analysis for the Proposed Action

Generation of GHG Emissions. The delivery and application of up to 13,500 CY of dredged sediments from the Main Channel West site to the Refuge project site will result in the short-term generation of GHG emissions, with the majority of the activities, and thus the majority of the GHG emissions, occurring over a period of four to six weeks. For purposes of calculating GHG emissions, it was assumed that emissions could be generated for up to 45 days. Construction activities associated with the project will result in GHG emissions associated with fuel combustion from two workboats (500 hp), commuter vehicles traveling to and from the project site (12 trips/day), and depending on how sediment is transported to the site, a containment barge (500 hp) and booster pump (with a motor ranging from 150 hp to 500 hp). Estimated emissions associated with construction activities are summarized in Table 14. A description of the methodology used in estimating project-related emissions is provided under the air quality discussion.

Table 14
Estimate of GHG Emissions Associated with the Proposed Pilot Project

	Emissions (total metric tons)			
	CO_2	CH_4	N_2O	CO_2e
Workboats (2 w/ 500 hp motor)	64.3	0	0	64.3
Containment Barge (500 hp motor)	7.5	0	0	7.5
Booster Pump (150 to 500 hp motor)[1]	26.3	0	0	26.3
Worker Commute	7.7	0	0.02	13.7
Maximum Total	*113.4*	*0*	*0.02*	*119.4*
Maximum 30-year Amortized Total	—	—	—	*3.98*
CAPCOA Threshold	—	—	—	900
Exceed Significant Threshold?	—	—	—	No

[1] Calculation assumes worst case (500 hp)

Following the methodology prescribed by the SCAQMD CEQA Significance Threshold Working Group, total project-related construction emissions were amortized over the life of the project, defined by SCAQMD as 30 years, to obtain total annual GHG emissions (CO_2e) of less than 4 metric tons. The CAPCOA threshold is 900 metric tons. Consequently, the impact of GHG emissions generated from this project is considered less than significant and not adverse. Therefore, no mitigation is proposed.

Once the sediment application process is completed, emissions from small boats used for monitoring could be generated for 48 hours over the course of a year, with monitoring proposed for at least five years. Monitoring will likely occur using a combination of

motorized and non-motorized vessels. The use of some non-motorized vessels will reduce the total emissions. Overall, GHG emissions associated with the monitoring program will be less than significant.

Consistency with Applicable Plans, Policies, or Regulations. AB 32 identified the acceptable level of GHG emissions in California in 2020 as 427 million metric tons of CO_2e, which is the same as the 1990 GHG emissions level and approximately 28.5 percent less than 2020 BAU conditions (596 million metric tons of CO_2e). It should be noted that the 2020 BAU has been revised downward by the Air Resources Board (ARB) to 545 metric tons of CO_2e, which reflects reduced GHG emission estimates resulting from the recent economic downturn. To reach the GHG emissions target level, there will have to be widespread reductions in GHG emissions across California. Some reductions will need to come in the form of changes pertaining to vehicle emissions and mileage standards. Some will come from changes pertaining to sources of electricity and increased energy efficiency at existing facilities. The remainder will need to come from plans, policies, or regulations that will require new facilities to have lower carbon intensities than they have under BAU conditions.

As discussed above, the GHG emissions to be generated by the proposed action will be below the CAPCOA threshold of 900 metric tons. As such, the proposed project will be consistent with the AB 32 goal of reducing statewide GHG emissions to 1990 levels by 2020. The project will not conflict with this GHG emissions-reduction plan.

The enhancement of coastal salt marsh vegetation, which is the intent of this project, will provide benefits related to carbon sequestration. Studies indicate that marsh grasses and other macrophytes, microalgae on the mud surface, and phytoplankton are the three primary components of the natural salt marsh community that remove large amounts of CO_2 from the atmosphere and store the carbon in the marsh soils (Choi et al. 2004, Brigham et al. 2006). Although the benefits will be small because the project is limited to 10 acres, if thin-layer sediment augmentation proves to be an effective sea level rise adaptation strategy for conserving coastal salt marshes threatened by inundation, the carbon sequestration benefits will be much greater.

Impact Analysis for the No Action Alternative

Generation of GHG Emissions. Under the no action alternative, no sediment from the maintenance dredging project would be transported to and disposed of on the Refuge site. Therefore, emissions associated with transport to the site and boats used for monitoring would not be generated. The 10,000 to 13,500 CY of dredged sediment from Huntington Harbour would however still require disposal, therefore, even under the no action alternative, GHG emissions would be produced during the transport of these sediments to a different disposal site.

Consistency with Applicable Plans, Policies, or Regulations. A decision not to implement the proposed action would have no effect on the applicable plans, policies, or regulations.

E. Hazards and Hazardous Materials

Thresholds of Significance

The following thresholds of significance are based on Appendix G of the CEQA Guidelines. Project implementation would result in significant impacts related to hazardous materials if any of the following would occur:

- A significant hazard to the public or the environment would be created through the routine transport, use, or disposal of hazardous materials;
- A significant hazard to the public or the environment would be created through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- Hazardous emissions would be emitted or hazardous or acutely hazardous materials, substances, or waste would be handled within one-quarter mile of an existing or proposed school; or
- The project site occurs on a site that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment.

Impact Analysis for the Proposed Action

Neither the Main Channel West maintenance dredging site nor the Refuge receiving site contain hazardous materials that could adversely affect the environment. Further, the contaminated sites located within Naval Weapons Station Seal Beach, are not considered a threat to offsite locations (Southwest Division, Naval Facilities Engineering Command 1995), including the 16-acre project site. Therefore, impacts related to hazardous materials within the site that would create a significant hazard to the public or the environment will not occur, and no mitigation measures are required.

Implementation of the proposed pilot project requires the operation of boats and other motorized equipment within the tidal channels of the Refuge. Such operations have the potential to release hazardous materials such as gas and oil into the waterway due to spills or leaks related to the operation of the machinery. Requirements of appropriate local and State agencies for the implementation of best management practices (BMPs), the provision of spill kits on all vessels, and adherence to spill reporting requirements minimizes the potential for adverse effects to waterways as a result of the proposed operation. Because the project will comply with Federal, State, and local hazardous waste regulations, impacts related to the inadvertent release of hazardous materials into the waterways surrounding the project site will be less than significant, and no mitigation will be required.

The dredged material to be applied to the project site has been tested and found to be appropriate for placement within the 16-acre pilot project site. Therefore, the project will not create a significant hazard due to the disposal of hazardous materials. Impacts will remain less than significant, and no mitigation measures are required.

Impact Analysis for the No Action Alternative
No activities would occur on the 16-acre pilot project site under this alternative; therefore, there would be no potential for adverse effects related to hazardous materials.

F. Water Quality

Thresholds of Significance
Adverse impacts to water quality would be considered significant if the action would violate any water quality standards or waste discharge requirements, substantially increase downstream sedimentation or turbidity levels in Anaheim Bay or the marsh complex, introduce contaminants (non-point source pollution) into the watershed, or otherwise substantially degrade water quality.

Impact Analysis for the Proposed Action
Sedimentation and Turbidity. The pilot project will involve the spraying of 10,000 to 13,500 CY of sediment onto 10 acres of the 16-acre site located adjacent to two tidal channels in Anaheim Bay. As a result, the project has the potential to introduce sediment into the adjacent tidal channels. Turbidity levels in these adjacent waters will increase, at least temporarily, if sediments in the dredge slurry move off the site and into adjacent tidal changes. Monitoring of sediment movement and turbidity levels will occur during the sediment application process and application methods will be adaptively managed to ensure that movement of sediment off the site is minimized. Measures such as installation of silt fencing or a silt curtain will be installed if proposed vegetative buffers around the site cannot adequately maintain the sediment within the project boundary.

Following completion of the application process, post-application monitoring will include evaluation of sediment retention on the site and turbidity levels in the adjacent tidal channels. Turbidity sensors will be deployed to measure suspended sediment concentrations in the water. Following sediment application, sediment retention in the treatments will be monitored by cryo-coring within subplots that have been pre-treated with a feldspar marker horizon.

According to Ray (2007), based on experiences in Gulf Coast, spray disposal operations, which have the capability to deliver a variety of soil types ranging from sands to heavy clays and organic sediments, can be modified to target specific sites and avoid sensitive areas. Cahoon and Cowan (1987, 1988) report that in their experience, water from the liquid slurry rapidly drains off, quickly leaving the deposited sediment without producing unusually high levels of turbidity. The sediment to be applied to the pilot project site consists of a mixture of silt, sand, and clay (refer to Table 11), which has a moderate potential for localized increases in turbidity should material move off this site. Because this practice has not been attempted on the Pacific Coast, it will be necessary to adaptively manage the application project to meet project design criteria, including minimizing the potential for the introduction of sediment into the tidal channels that abut the site.

Mitigation Measures WQ-1 and 2 will ensure that appropriate actions are implemented to reduce the potential for turbidity associated with transporting and applying sediment to the

16-acre pilot project site. Implementation of these measures will reduce potential impacts to a less-than-significant level.

Mitigation Measure WQ-1: Prior to initiation of sediment transport and application to the pilot project site, the Service shall submit an application to the Santa Ana Regional Water Quality Control Board for coverage under a 401 Certification. The Service shall implement all conditions included in the 401 Certification, including the implementation of measures to reduce potential increases in sedimentation, turbidity, and other impacts associated with the transport and beneficial use of dredge material for habitat enhancement.

Mitigation Measure WQ-2: To reduce the potential for sediment to enter adjacent waterways, best management practices (BMPs) shall be implemented throughout the pilot project's sediment transport and application process. BMPs shall include providing approximately six acres of vegetated buffer around the application site; periodic inspection of sediment pipelines; and monitoring for excessive turbidity in the vicinity of the transport pipeline or containment barge and associated sediment distribution apparatus (e.g., rainbow sprayer, open pipe, end-of-pipe baffle impingement). If a substantial leak is identified in a pipeline carrying sediment, the affected pipeline segment shall be immediately repaired or replaced, or a silt curtain or similar measure shall be employed to capture and retain sediment at the source of the leak. Monitoring of sediment movement and turbidity levels shall also occur during sediment application, and application methods shall be adaptively managed to ensure that movement of sediment off the site is minimized. Measures such as installation of silt fencing or a silt curtain shall be installed if proposed vegetative buffers around the site cannot adequately maintain the sediment within the project boundary.

Chemical Pollutants. Based on the results of the sediment characterization (Kinnetic Laboratories, Inc. and Moffatt &Nichol 2014) conducted for the sediments to be dredged from the Main Channel West site, the sediment chemistry will not result in the release of any chemical constituents into adjacent waters that would represent cause for concern. Therefore, the sediments to be disposed of on the pilot project site will not represent a potentially significant impact to water quality with respect to any chemical constituents.

Impact Analysis for the No Action Alternative

The potential for impacts related to increased turbidity that could result from sediment transport and application onto the Refuge project site would not occur under the no action alternative.

G. Noise

Thresholds of Significance

An action that generates noise levels at the property line in excess of the affected city's noise standards would be considered a significant adverse effect.

Impact Analysis for the Proposed Action

Noise generated from the proposed pilot project will be generated by workboats, the flow of sediment from the application sprayer, and possibly a containment barge and booster pump. The noise will occur for a period of four to six weeks. However, this activity will occur more than 1,000 feet from the nearest dwelling unit or other sensitive receptor, therefore, residents will be unaffected by noise generated at the project site. The temporary increase in noise at the project site is considered less than significant, and no mitigation measures are required.

Impact Analysis for the No Action Alternative

The potential for temporary increases in noise associated with maintenance dredging, which would be implemented with or without the Refuge's sediment augmentation component, would be identical to those address above. The implementation of Mitigation Measure NOI-1 would reduce potential impacts to a less-than-significant level. No noise would be generated on the Refuge from construction equipment under the no action alternative.

7. Cumulative Effects

The proposed project would not result in any impacts to aesthetics or visual quality, air quality, agricultural resources, land use or traffic and transportation; the project would not involve the handling, disposal, or transport of hazardous materials or cause a hazardous release; the project is not located in a valuable mineral resource area; it would not add to the regional population; and it would not substantially increase the use of public services or utilities such that new services would be required. Therefore, any less-than-significant impact the proposed project has on these resources would not contribute to significant cumulative impacts to a considerable degree when combined with past, present, and reasonably foreseeable cumulative projects. Impacts related to these environmental topics would be less than cumulatively considerable.

As described in the previous sections of this document, the proposed project and the no action alternative would result in less-than-significant direct impacts on biological resources, cultural resources, and water quality with the implementation of required mitigation measures identified in the aforementioned resource areas of this document.

A cumulative impact could occur if the project would result in an incrementally considerable contribution to a significant cumulative impact in consideration of past, present, and reasonably foreseeable future projects for each resource area. The cumulative study area is confined to an approximately 2-mile radius around the project site. However, for some resources, cumulative impacts are considered over a greater area, and are addressed accordingly.

The following analysis evaluates the potential for the project to contribute considerably to a cumulative impact.

Biological Resources

Proposed Action

Eelgrass. Eelgrass habitat exists on the bottom of the Harbour floor within the proposed dredge footprint and in the subtidal channels adjacent to the Refuge project site. Eelgrass impacts will be mitigated by restoration of eelgrass at other locations in accordance with Mitigation Measures BIO-3. Past dredging projects have implemented similar mitigation measures for impacts to eelgrass. Current and future projects within the Harbour would be conducted by OC Parks, and similar requirements for mitigation would apply to those projects. Therefore, the proposed action will not contribute to a cumulative loss of eelgrass.

Light-footed Clapper Rail. Implementing the proposed action will result in the short-term loss (two to five years) of approximately 2.8 percent of the total foraging habitat within the Refuge. This temporary loss is not expected to impact the existing rail population on the Refuge. In addition, any direct or indirect impacts to rails will be mitigated through the implementation of Mitigation Measures BIO-1 and BIO-4. As the intent of the proposed action is to benefit these rails by improving habitat quality at the project site and providing valuable data regarding the effectiveness of the proposed action of improving habitat elsewhere on the Refuge, a benefit to rails is anticipated as a result of this project. The proposed action will not contribute to cumulative adverse effects to rails.

Eastern Pacific Green Turtle and Sensitive Marine Mammals. The implementation of Mitigation Measure BIO-2 will ensure that no adverse effects to sea turtles or sensitive marine mammals would occur as a result of the proposed action; therefore, the proposal will not contribute to a cumulatively significant impact.

Salt Marsh Vegetation. The proposed action will result in short term loss of approximately 1.8 percent of the total salt marsh habitat on the Refuge, with the intent of improving habitat quality following reestablishment of native salt marsh vegetation on a higher marsh plain. Mitigation Measure BIO-1 will ensure that no long term loss of salt marsh would occur. As such, the proposal will not contribute to a cumulatively to the loss of salt marsh vegetation.

No Action Alternative

No activities would occur on the Refuge under this alternative. Present and future projects would comply with the requirements of the Migratory Bird Treaty Act, Endangered Species Act, and other Federal and State regulations and policies related to the project of sensitive species and habitats to avoid and/or mitigate potential impacts to sensitive resources. Changes from the proposed project in combination with other past, present, and reasonably foreseeable future projects would not contribute to a cumulatively considerable impact on biological resources.

Cultural Resources

Under both the proposed action and no action alternative, present and future projects in the area would be required ensure the protection of cultural resources. Due to the site-specific nature of cultural resources impacts, changes from the proposed project in combination with other past, present, and reasonably foreseeable future projects will not contribute to a

cumulatively considerable impact. After the incorporation of the mitigation measures provided herein the project is not expected to impact cultural resources, or to have any cumulative impacts on cultural resources.

Greenhouse Gas Emissions

The proposed action will generate GHG emissions and will contribute, albeit incrementally, to the total GHG emission in the Air Basin. However, the GHG emissions associated with the implementation of the pilot project will be below the CAPCOA threshold of 900 metric tons and below SCAQMD's thresholds, which were adopted to help achieve the GHG emissions reduction goals of AB 32. As such, the proposed project will be consistent with the AB 32 goal of reducing statewide GHG emissions to 1990 levels by 2020. The project will not conflict with this GHG emissions-reduction plan and will not represent a significant adverse cumulative effect with respect to GHG emissions.

Further, the project is intended to improve vegetation vigor in coastal salt marsh habitat. If successful, thin-layer sediment augmentation could be implemented elsewhere along the California coast as an adaptation strategy for addressing sea level rise in coastal salt marsh habitats, particularly in those salt marshes where there will be no opportunity for inland migration. The result would be the preservation of significant acreage of coastal salt marsh habitat, which annually sequesters carbon at a rate two to four times greater than mature tropical forests and stores three to five times more carbon per equivalent area than tropical forests (NOAA Habitat Conservation, www.habitat.noaa.gov/coastalbluecarbon.html).

Water Quality

The geographic scope for cumulative impacts on hydrology and water quality includes the Coastal Plain of Orange County Groundwater Basin. The cumulative setting for water quality includes all the development and infrastructure that have occurred in the areas surrounding and upstream of the Refuge in the past and would be expected to occur in the future. Implementation of either the proposed action or the no action alternative has the potential to contribute to cumulative water quality impacts by direct in-water disposal (at approved specified sites) and indirectly discharging dredged material during transport and application on the Refuge project site. Such occurrences could contribute to a violation of WDRs generation of stormwater runoff during construction and operation. The majority of the past, present, and reasonably foreseeable future projects would have associated construction impacts with the potential to result in discharge of stormwater to surface waters, either directly or, more commonly, via a local stormwater collection system. All of these projects have been and would be required to comply with regulatory agency requirements for disposal of dredge material and construction stormwater requirements of the local jurisdiction and compliance with the general NPDES permit for construction stormwater discharges. Furthermore, the BMPs and project design features would minimize the potential for sedimentation into the bay and tidal channels that could result from project implementation. All impacts resulting from the proposed project related to water quality will be less than significant. Thus, water quality impacts related to the proposed project will be less than significant and will not be cumulatively considerable.

Noise

The cumulative study area for noise includes the areas immediately surrounding the project site. Because there will be no operational aspects of the proposed action or the no action alternative that could contribute any noise, cumulatively significant impacts are addressed for construction only. Construction activities will occur within the permitted timeframes, as prescribed by Chapter 8.40.090[d] of the City's Noise Ordinance. Similarly, any other projects that would occur during the same time as the proposed project would be required to comply with the City's Noise Ordinance. Because compliance with the City's Noise Ordinance would be enforced for any present and/or future cumulative projects in the area, the proposed project will not contribute to a cumulatively considerable impact on noise during construction.

8. Direct or Indirect Environmental Effects on Human Beings

Based on the analysis presented in this document, the proposed project will have potentially significant environmental effects on biological resources, cultural resources, and water quality that could cause substantial adverse effects on human beings, either directly or indirectly. However, implementation of mitigation measures as provided within each of these resource topic sections will reduce project-related potentially significant impacts to a less-than-significant level. Therefore, after implementation of mitigation measures, the proposed project will result in a less-than-significant environmental impact on human beings.

9. Environmental Justice

Neither the proposed action nor the no action alternatives will result in disproportionate adverse human health impacts or environmental effects to low-income or minority populations.

10. Irretrievable and Irreversible Commitment of Resources

Implementation of the proposed action will require the commitment of non-renewable resources, primarily petroleum products, to transport and apply sediment to the site. All other aspects of the project are reversible, although by doing so additional non-renewable resource would be required.

11. Short-Term Uses of the Environment and Long-Term Productivity

Implementation of the proposed action will result the short-term generation of GHG emissions and other air emissions, the consumption of petroleum products, and the use of dredge sediments from Huntington Harbour. These short-term uses of the environment are intended to result in improved and long-term productivity of coast salt marsh habitat, which will result in a range of environmental benefits.

12. Energy Requirements and Conservation Potential of Alternatives

The energy requirements for implementing the proposed project are limited in terms of both total consumption and duration. The no action alternative would result in somewhat greater energy

requirements as the 10,000 to 13,500 CY of sediment that would be placed on the Refuge under the proposed action would have to be disposed of either at LA-2 or an upland location. Both disposal sites would be located considerably further away from the dredge site than is the proposed sediment augmentation site.

13. Document Preparation

Victoria Touchstone, USFWS, San Diego NWR Complex
Evyan Borgnis, California State Coastal Conservancy, Project Manager
Kirk Gilligan, USFWS, Refuge Manager

14. Agencies and Persons Consulted

Naval Weapons Station Seal Beach, Installation Environmental Program
U.S. Army Corps of Engineers, Regulatory Division
U.S. Fish and Wildlife Service, Carlsbad Fish and Wildlife Office
Richard Zembal
Susan Hoffman
John Fitch
U.S. Geological Survey, San Francisco Bay Estuary Field Station
U.S. Geological Survey, Western Ecological Research Center
Susan Brodeur, Orange County Parks (OC Parks)
Kimberly Garvey, Moffatt and Nichol Engineers
Richard Ambrose, Ph.D., UCLA
Christine Whitcraft, Ph.D., CSU Long Beach
Ralph G. Appy, Ph.D., Cabrillo Marine Aquarium

15. References Cited

Atwood, J.L. and P.R. Kelly. 1984. Fish dropped on breeding colonies as indicators of least tern food habits. Wilson Bulletin 96:34-47.

Brigham, S.D., J.P. Megonigal, J.K. Keller, N.P. Bliss, and C. Trettin. 2006. The carbon balance of North American wetlands. Wetlands 26:889-916.

Cahoon, D. R., and J. H. Cowan, Jr. 1987. Spray disposal of dredged material in coastal Louisiana: Habitat impacts and regulatory policy implications. Louisiana Sea Grant College Program. Baton Rouge, LA: Center for Wetlands Resources, Louisiana State University.

Cahoon, D. R., and J. H. Cowan, Jr. 1988. Environmental impacts and regulatory policy implications spray disposal of dredged material in Louisiana wetlands. Coastal Management 16:341-362.

California Air Pollution Control Officers Association (CAPCOA). 2008. CEQA & Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act.

California Air Resources Board (ARB). 2013. iADAM Air Quality Data Statistics: Top 4 Summary Pollutant/Year Range Selection. Available: <http://www.arb.ca.gov/adam/topfour/topfour1.php>. Accessed: October 14, 2013.

California Department of Fish and Game (CDFG). 1975. The Marine Resource of Anaheim Bay. Fish Bulletin 165. E. David Lane and Cliff W. Hill editors.

California Department of Fish and Game and U.S. Fish and Wildlife Service (CDFG and USFWS). 1976. The Natural Resources of Anaheim Bay.

California State Water Resources Control Board. 2011. California 2010 303(d) list. Available: http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml. Accessed: 02/24/14.

ChaduxTt (A Joint Venture of St. George Chadux Corp. and Tetra Tech EM Inc.). 2011. Final Site Inspection Report for Munitions Response Program Sites UXO1, UXO2, UXO6, AOC1, and AOC2 Naval Weapons Station Seal Beach, California. Prepared for Department of the Navy, NAVFAC Southwest San Diego, California 92132.

Choi, Y. and Y. Wang. 2004. Dynamics of carbon sequestration in a coastal wetland using radiocarbon measurements. Global Biogeochemical Cycles 18:GB4016.

Collins, C. T. 2007. Biology of the California Least Tern at Naval Weapons Station Seal Beach, in the 2003 to 2007 Breeding Seasons. Unpublished report prepared for the Environmental Core Naval Facilities Engineering Command Southwest, San Diego, California under agreement with California State University Long Beach Foundation, Long Beach, California.

Department of Toxic Substances Control (DTSC). Envirostor database. Available: http://www.envirostor.dtsc.ca.gov/public/. Accessed: December 4, 2013.

Ford, M. A., D. R. Cahoon, and J. C. Lynch. 1999. Restoring marsh elevation in a rapidly subsiding salt marsh by thin-layer deposition of dredged material. Ecological Engineering 12:189-205.

Intergovernmental Panel on Climate Change (IPCC). 2007. Climate Change 2007b: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change [Parry, Martin L., Canziani, Osvaldo F., Palutikof, Jean P., van der Linden, Paul J., and Hanson, Clair E. (eds.)]. Cambridge University Press, Cambridge, United Kingdom.

James, R. and D. Stadtlander. 1991. A survey of the Belding's savannah sparrow (*Passerculus sandwichensis beldingi*) in California, 1991. A report of the California Department of Fish and Game, Nongame Bird and Mammal Section Report 91-05.

Jirik, KE and CG Lowe. First reported occurrences of the green sea turtle, *Chelonia mydas*, in the Anaheim Bay Estuary (Seal Beach, California). In review.

Kellogg, M. G. 1980. "Status of the California Brackishwater Snail, *Tryonia imitator*, in Central California." Inland Fisheries Endangered Species Program, Special Publication 80-3. California Department of Fish and Game: Sacramento, CA.

Kinnetic Laboratories, Inc. and Moffatt &Nichol. 2014. Sampling and Analyis Report, Dredge Material Evaluation Sunset/Huntington Harbour Maintenance Dredging and Waterline Installation Project. Prepared for: County of Orange, OC Community Resources/OC Parks and the City of Huntington Beach, Public Works Department. May 2014.

Klingbeil, R. A., R. D. Sandell and A. W. Wells. 1975. An annotated checklist of the elasmobranchs and teleosts of Anaheim Bay. In E.D. Lane, C.W. Hill, eds., the Marine Resources of Anaheim Bay. California Department of Fish and Game, Fish Bulletin 165.

Lane, E. David. 1975. Early Collections of Fishes from Anaheim Bay Made Between 1919 and 1928. In The Marine Resource of Anaheim Bay. Fish Bulletin 165. California Department of Fish and Game. 1975. E. David Lane and Cliff W. Hill editors.

Lindig-Cisneros and J. B. Zedler. 2002. Halophyte Recruitment in a Salt Marsh Restoration Site. Estuaries 25(6A):1174–1183. December 2002.

Massey, B.W. 1974. Breeding biology of the California least tern. Proc. Linnaean Soc. 72:1-24.

Massey, B.W., R. Zembal, and P.D. Jorgensen. 1984. Nesting habitat of the Light-footed Clapper Rail in Southern California. Journal of Field Ornithology 55(1): 67-80.

Merkel & Associates, Inc. 2014. 2013 Anaheim Bay Benthic And Fish Community Assessments At Naval Weapons Station Seal Beach Final Report CONTRACT # N62473-10-D-0805. Prepared for: Department of the Navy Naval Facilities Engineering Command, Southwest and Naval Weapons Station Seal Beach, Environmental Department.

Morzaria-Luna, H., J.C. Callaway, G. Sullivan, and J.B. Zedler. 2004. Relationship between topographic heterogeneity and vegetation patterns in a Californian salt marsh. Journal of Vegetation Science 14:523-530.

National Oceanic and Atmospheric Administration. n.d. Climate of Los Angeles. Available: <http://www.wrh.noaa.gov/lox/climate/climate_intro.php>.

National Marine Fisheries Service (NOAA) and U.S. Fish and Wildlife Service (USFWS). 1998. Recovery Plan for U.S. Pacific Populations of the East Pacific Green Turtle (*Chelonia mydas*). National Marine Fisheries Service, Silver Spring, MD.

Naval Facilities Engineering Command (NAVFAC). 2014. Presentation entitled, "Project Highlights," and presented by Brenda Reese, RPM and NAVWPNSTA Seal Beach Environmental Team on July 23, 2014 at the RAB Meeting, Naval Weapons Station Seal Beach.

Nordby Biological Consulting and Tijuana River National Estuarine Research Reserve. 2014. South San Diego Bay Coastal Wetland Restoration and Enhancement Project Year 2 Postconstruction Monitoring Report. Unpubl. May 2014.

Orange County Parks and the City of Huntington Beach (OC Parks IS/MND). 2014. Sunset/Huntington Harbour Maintenance Dredging and Waterline Installation Project Draft Initial Study/Mitigated Negative Declaration IP 14-148. Prepared by ICF International.

Pacific Fishery Management Council (PFMC). 2014. Pacific Coast Groundfish Fishery Management Plan for the California, Oregon, and Washington Groundfish Fishery. Portland, OR. May 2014.

Pacific Fishery Management Council (PFMC). 2011. Coastal Pelagic Species Fishery Management Plan, as amended through Amendment 13. Portland, OR. September 2011.

Powell, A.N. and C.L. Collier. 1998. Reproductive success of Belding's savannah sparrows in a highly fragmented landscape. Auk 115(2): 508-513.

Ray, Gary. 2007. Thin Layer Placement of Dredged Material on Coastal Wetlands: A Review of the Technical and Scientific Literature. U.S. Army Corps of Engineers. ERDC/EL TN-07-1. December 2007.

Reish, J.R., T.K.J. Kauwling and T. C. Schreiber. 1975. Annotated checklist of the marine invertebrates of Anaheim Bay. Pages 41 - 51 in E.D. Lane, C.W. Hill, eds., the Marine Resources of Anaheim Bay. California Department of Fish and Game, Fish Bulletin 165.

Slocum, M. G., I. Mendelssohn, and N. L. Kuhn. 2005. Effects of sediment slurry enrichment on salt marsh rehabilitation: Plant and soil responses over seven years. Estuaries 28:519-528.

South Coast Air Quality Management District (SCAQMD). 2006. Final –Methodology to Calculate Particulate Matter (PM) 2.5 and PM 2.5 Significance Thresholds. October.

South Coast Air Quality Management District (SCAQMD). 2008. Final Localized Significance Threshold Methodology. July.

South Coast Air Quality Management District. 2009. Localized Significance Threshold Methodology for CEQA Evaluations. June.

South Coast Air Quality Management District (SCAQMD). 2011a. SCAQMD Rules and Regulations. Available: http://www.aqmd.gov/rules/rulesreg.html>. Last Updated: June 9, 2011.

South Coast Air Quality Management District. 2011b. SCAQMD Air Quality Significance Thresholds. Available: <http://www.aqmd.gov/ceqa/handbook/signthres.pdf>. March

South Coast Air Quality Management District. 2013. Final 2012 Air Quality Management Plan.

Southern California Association of Governments. 2012. 2012 Regional Transportation Plan/Sustainable Communities Strategy – Home. April 4. Available: <http://www.scag.ca.gov/rtp2012/index.htm>.

Southwest Division, Naval Facilities Engineering Command. 1995. Naval Weapons Station Seal Beach Seal Beach, California. Installation Restoration Program Final National Wildlife Refuge Study Report. Through Contract #N88711-89-D-9296, CTO #0237, Document Control No: CLE-C01-01F237-S2-0001. With: Jacobs Engineering Group Inc. In association with: International Technology Corporation CH2M HILL.

Takekawa, J.Y., K. M. Thorne, K. J. Buffington, C. M. Freeman, and G. Block. 2013a. Downscaling climate change models to local site conditions: San Diego National Wildlife Refuge Complex. Unpubl. Data Summary Report. U.S. Geological Survey, Western Ecological Research Center, Vallejo, CA.

Takekawa, J. Y., K. M. Thorne, K. J. Buffington, C. M. Freeman, and G. Block. 2013b. Evaluation of subterranean subsidence at Seal Beach National Wildlife Refuge. Unpubl. Data Summary Report. U. S. Geological Survey, Western Ecological Research Center, Vallejo, CA.

U.S. Environmental Protection Agency (EPA). 2003. Dredged Material Management Action Agenda for the Next Decade. Based on a workshop sponsored by the National Dredging Team, January 23 – 25, 2001 in Jackson, Florida. July 2003.

U.S. Environmental Protection Agency (EPA). 2013. National Ambient Air Quality Standards (NAAQS). Available: Last Updated: December 14, 2012.

U.S. Environmental Protection Agency (EPA). 2014. Greenbook of Nonattainment Areas for Criteria Pollutants. Available: <http://www.epa.gov/oar/oaqps/greenbk>. Accessed: October 3, 2013.

U.S. Fish and Wildlife Service (USFWS) and U.S. Navy, Naval Weapons Station Seal Beach. 1991. Final Environmental Impact Statement for the Endangered Species Management and Protection Plan Naval Weapons Station Seal Beach and Seal Beach National Wildlife Refuge.

U.S. Fish and Wildlife Service (USFWS). 1985. Recovery Plan for the Light-footed Clapper Rail. Portland, Oregon.

U.S. Fish and Wildlife Service (USFWS). 1993. Endangered and threatened wildlife and plants; determination of threatened status for the Pacific coast population of the western snowy plover; final rule. *Federal Register* 58(42):12864-12874.

U.S. Fish and Wildlife Service (USFWS). 2008. Birds of Conservation Concern 2008. Division of Migratory Bird Management, Arlington, Virginia.

U.S. Fish and Wildlife Service (USFWS). 2007. Recovery Plan for the Pacific Coast Population of Western Snowy Plover (*Charadrius alexandrinus nivosus*). California Nevada Operations Office, Sacramento, CA.

U.S. Fish and Wildlife Service (USFWS). 2010. Wetlands Mapper Documentation and Instructions Manual. U.S. Fish and Wildlife Service Division of Habitat and Resource Conservation Branch of Resource and Mapping Support National Standards and Support Team Madison, WI 53711-1061. August 2010.

U.S. Fish and Wildlife Service (USFWS). 2012. Final Seal Beach National Wildlife Refuge Comprehensive Conservation Plan.

U.S. Navy. 2007. Naval Weapons Station Seal Beach. Newsletter of the Environmental Investigation and Cleanup Program. October 2007.

U.S. Navy. 2014. Final Integrated Natural Resources Management Plan – Naval Weapons Station Seal Beach, California. U.S. Department of the Navy, Naval Weapons Station Seal Beach, Environmental Department. Under Contract with Naval Facilities (NAVFAC) Southwest.

Ward, K. M., J. C. Callaway, and J.B. Zedler. 2003. Episodic Colonization of an Intertidal Mudflat by Native Cordgrass (*Spartina foliosa*) at Tijuana Estuary. Estuaries 26(1):116-130.

Western Regional Climate Center (WRCC). 2012. Climate Summary for Long Beach WSCMO. Available: < http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca5085> .

Wilbur, S. R. 1974. The Status of the Light-footed Clapper Rail. American Birds. 28:868-870.

Zedler, J.B. 1993. Canopy Architecture of Natural and Planted Cordgrass Marshes: Selecting Habitat Evaluation Criteria. Ecological Applications 3(1):123-138.

Zembal, R.L. and S.M. Hoffman. 2002. A Survey of the Belding's Savannah Sparrow (*Passerculus sandwichensis beldingi*) in California, 2001. Species Conservation and Recovery Program Report No. 2002-01. Prepared under contract to the California Department of Fish and Game.

Zembal, R.L. and S.M. Hoffman. 2010. A Survey of the Belding's Savannah Sparrow (*Passerculus sandwichensis beldingi*) in California, 2010 (Draft). Species Conservation and Recovery Program Report No. 2010-xx. Prepared under contract to the California Department of Fish and Game.

Print Form

Appendix G

Environmental Checklist Form

NOTE: The following is a sample form and may be tailored to satisfy individual agencies' needs and project circumstances. It may be used to meet the requirements for an initial study when the criteria set forth in CEQA Guidelines have been met. Substantial evidence of potential impacts that are not listed on this form must also be considered. The sample questions in this form are intended to encourage thoughtful assessment of impacts, and do not necessarily represent thresholds of significance.

1. Project title: Seal Beach NWR – Thin-layer Sediment Augmentation Pilot Project

2. Lead agency name and address:
California State Coastal Conservancy
1330 Broadway, 13th Floor, Oakland, CA 94612

3. Contact person and phone number: Evyan Borgnis, Project Manager, 510-286-4091

4. Project location: Seal Beach National Wildlife Refuge, Orange County, California

5. Project sponsor's name and address:
U.S. Fish and Wildlife Service, San Diego National Wildlife Refuge Complex
P.O. Box 2358, Chula Vista, CA 91912

6. General plan designation: n/a, National Wildlife Refuge 7. Zoning: n/a

8. Description of project: (Describe the whole action involved, including but not limited to later phases of the project, and any secondary, support, or off-site features necessary for its implementation. Attach additional sheets if necessary.)
Refer to Section 4, Proposed Action in the accompanying Initial Study/Environmental Assessment.

9. Surrounding land uses and setting: Briefly describe the project's surroundings:
The 16-acre pilot project site is located near the center of the Seal Beach National Wildlife Refuge. The site and surrounding area consist of coastal salt marsh and associated tidal channels. Much of the Refuge is included within Naval Weapons Station Seal Beach. Huntington Harbour and urban development occur to the south and southeast of the Refuge.

10. Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement.)
Refer to Section 3, Decisions to be Made and Applicable Authorities in the accompanying Initial Study/Environmental Assessment.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agriculture and Forestry Resources	☐ Air Quality
☒ Biological Resources	☒ Cultural Resources	☐ Geology /Soils
☐ Greenhouse Gas Emissions	☐ Hazards & Hazardous Materials	☒ Hydrology / Water Quality
☐ Land Use / Planning	☐ Mineral Resources	☐ Noise
☐ Population / Housing	☐ Public Services	☐ Recreation
☐ Transportation/Traffic	☐ Utilities / Service Systems	☐ Mandatory Findings of Significance

DETERMINATION: (To be completed by the Lead Agency)

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

Signature _____ Date _____

Signature _____ Date _____

EVALUATION OF ENVIRONMENTAL IMPACTS:

1) A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3) Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4) "Negative Declaration: Less Than Significant With Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from "Earlier Analyses," as described in (5) below, may be cross-referenced).

5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration. Section 15063(c)(3)(D). In this case, a brief discussion should identify the following:

    a) Earlier Analysis Used. Identify and state where they are available for review.

    b) Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

    c) Mitigation Measures. For effects that are "Less than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion.

8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project's environmental effects in whatever format is selected.

9) The explanation of each issue should identify:

    a) the significance criteria or threshold, if any, used to evaluate each question; and

    b) the mitigation measure identified, if any, to reduce the impact to less than significance.

SAMPLE QUESTION
Issues:

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
I. AESTHETICS -- Would the project:				
a) Have a substantial adverse effect on a scenic vista? Views would not be obstructed; visibility of the site is limited.	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway? Site contains no scenic resources	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings? Temporary changes to the site would not be visible from the marsh edge.	☐	☐	☐	☒
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area? No lighting proposed during or following project implementation.	☐	☐	☐	☒
II. AGRICULTURE AND FOREST RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. -- Would the project:	The site is and will remain a coastal salt marsh.			
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Production (as defined by Government Code section 51104(g))?				
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
de) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒
III. AIR QUALITY -- Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:	Refer to Sections 6A and 7 of the accompanying Initial Study/Environmental Assessment.			
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☐	☒
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☐	☒
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☒
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒
IV. BIOLOGICAL RESOURCES -- Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
	Refer to Sections 6B and 7 of the accompanying Initial Study/Environmental Assessment.			
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☒	☐	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of	☐	☒	☐	☐

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?				
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☒	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒
V. CULTURAL RESOURCES -- Would the project:	Refer to Sections 6C and 7 of the accompanying Initial Study/Environmental Assessment.			
a) Cause a substantial adverse change in the significance of a historical resource as defined in § 15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to § 15064.5?	☐	☒	☐	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒
	No grading is proposed on site, core sampling of sediment and invertebrates will not exceed 2 feet below the surface of the marsh.			
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☒
VI. GEOLOGY AND SOILS -- Would the project:	Project limited to habitat enhancement, involves no structures or public access.			
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☐	☒
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☐	☒
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☒
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☒
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
VII. GREENHOUSE GAS EMISSIONS -- Would the project:	Refer to Sections 6D and 7 of the accompanying Initial Study/Environmental Assessment.			
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	☐	☒
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	☐	☒
VIII. HAZARDS AND HAZARDOUS MATERIALS - Would the project:	Refer to Sections 6E and 7 of the accompanying Initial Study/Environmental Assessment.			
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
for people residing or working in the project area?				
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒
IX. HYDROLOGY AND WATER QUALITY -- Would the project:	Refer to Sections 6F and 7 of the accompanying Initial Study/Environmental Assessment.			
a) Violate any water quality standards or waste discharge requirements?	☐	☒	☐	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☐	☒
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☐	☒
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☒
f) Otherwise substantially degrade water quality?	☐	☒	☐	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒
X. LAND USE AND PLANNING - Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
	The project is limited to habitat enhancement, no development is proposed. The project is consistent with the Seal Beach NWR Comprehensive Conservation Plan.			
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒
XI. MINERAL RESOURCES -- Would the project:	The project site consists of salt marsh habitat and supports no mineral resources.			
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒
XII. NOISE -- Would the project result in:	Refer to Sections 6G and 7 of the accompanying Initial Study/Environmental Assessment.			
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☐	☒
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
XIII. POPULATION AND HOUSING -- Would the project:	The project involves enhancement of existing coastal salt marsh habitat, no development is proposed, nor is the site designated for development in the future.			
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
XIV. PUBLIC SERVICES				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	The project involves enhancement of existing coastal salt marsh habitat, no development is proposed, nor is the site designated for development in the future.			
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒
XV. RECREATION --				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
	The project involves enhancement of existing coastal salt marsh habitat, no development is proposed, nor is the site designated for development in the future.			

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒
XVI. TRANSPORTATION/TRAFFIC -- Would the project:				
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☐	☒
	The project would generate approximately 12 trips per day during the 4 - 6 week construction period. No transportation improvements are proposed for the site in any State, local, or regional plans.			
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☐	☒
f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒
XVII. UTILITIES AND SERVICE SYSTEMS -- Would the project:	The project involves enhancement of existing coastal salt marsh habitat, no development is proposed, nor is the site designated for development in the future.			
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which	☐	☐	☐	☒

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
could cause significant environmental effects?				
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒
XVIII. MANDATORY FINDINGS OF SIGNIFICANCE --				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒ Refer to Sections 6B, 6C, and 6F of the accompanying Initial Study/Environmental Assessment.	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☒ Refer to Section 7 of the accompanying Initial Study/Environmental Assessment.	☐	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐ Refer to Section 8 of the accompanying Initial Study/Environmental Assessment.	☐	☒

Note: Authority cited: Sections 21083, 21083.05, Public Resources Code. Reference: Section 65088.4, Gov. Code; Sections 21080, 21083.05, 21095, Pub. Resources Code; *Eureka Citizens for Responsible Govt. v. City of Eureka* (2007) 147 Cal.App.4th 357; *Protect the Historic Amador Waterways v. Amador Water Agency* (2004) 116 Cal.App.4th at 1109; *San Franciscans Upholding the Downtown Plan v. City and County of San Francisco* (2002) 102 Cal.App.4th 656.