FINAL
ENVIRONMENTAL ASSESSMENT

COASTAL WETLAND RESTORATION
AT THE D STREET FILL
SWEETWATER MARSH UNIT OF THE
SAN DIEGO BAY NATIONAL WILDLIFE REFUGE
SAN DIEGO COUNTY, CALIFORNIA

Lead Agency:

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EXECUTIVE SUMMARY

Introduction: This final environmental assessment (EA) has been prepared by the U.S. Fish and Wildlife Service (Service or USFWS) to describe and analyze the environmental effects of the Coastal Wetland Restoration at the D Street Fill Sweetwater Marsh Unit of the San Diego Bay National Wildlife Refuge (NWR), a proposal to restore a portion of the D Street Fill to intertidal wetlands consistent with the recommendations presented in the San Diego Bay NWR Comprehensive Conservation Plan (CCP) (USFWS 2006). The proposed restoration would occur near the southeast corner of the D Street Fill, located to the west of Interstate 5 and south of the Sweetwater River flood control channel, within the Sweetwater Marsh Unit of the San Diego Bay NWR, in Chula Vista, San Diego County, California.

NEPA Process: The project is subject to the National Environmental Policy Act (NEPA), because it is proposed on lands owned and managed by the Federal government and the Service, a Federal agency, will implement the project. This EA has been prepared by the Service in accordance with NEPA (42 USC 4341 et seq.) and the Council on Environmental Quality (CEQ) NEPA Regulations contained in C.F.R. Parts 1500-1508. The analysis presented in the final EA provide the basis for the Service's determination to implement the proposed action, as well as the basis for determining that the proposed action would not constitute a major Federal action significantly affecting the quality of the human environment. Our decision to prepare a Finding of No Significant Impact (FONSI) is supported by the final EA (USFWS 2015).

Purpose and Need: The purpose of the proposed action is to restore a portion of the D Street Fill to intertidal wetlands consistent with the recommendations presented in the San Diego Bay NWR CCP (USFWS 2006). The restoration of 11.03 acres of coastal wetlands also represents compensatory mitigation for impacts to jurisdictional wetlands associated with the San Diego Gas and Electric Company (SDG&E) South Bay Substation Relocation (SBSR) project. The proposed restoration is needed to assist the Refuge in achieving the goals and objectives of the Refuge's CCP, including the CCP's goal to provide opportunities for reversing the trend of historical wetland loss in San Diego Bay by incorporating proposals for restoring, where possible, the Refuge's historical native habitats.

Public Involvement and Agency Coordination: Comments on the draft EA were solicited from various local, State, and Federal government agencies, tribal governments, non-governmental organizations, and the public during the 30-day comment period (July 29, 2015 to August 27, 2015). The draft EA distribution list is provided in Appendix C. The draft EA was also sent to the California State Clearinghouse (SCH#15071069) for distribution to interested State agencies. Five comment letters were received during the public comment period. These letters and our responses are provided in Appendix D. Underlined text in the Final EA represents changes made

between the draft EA and Final EA in response to comments received during the public comment period.

The comments received during the public review period have been considered by the Service during our analysis of the proposed action and alternatives, in determining the effects to the human environment, and in selecting the preferred alternative for implementation. Agency consultation and coordination with California Coastal Commission (CCC), U.S. Army Corps of Engineers (USACE), San Diego Unified Port District (SDUPD), and National Oceanic and Atmospheric Administration (NOAA) was also conducted and considered as part of our decision making process.

Project Summary: The Service, in partnership with SDG&E, proposes to implement Alternative B, the proposed action, which would restore 11.03 acres of tidally influenced coastal wetland habitat and 1.41 acres of upland transition habitat within a 12.44-acre area at the southeast corner of the D Street Fill. Preparation of the site to support 0.62 acre of subtidal habitat, 0.98 acre of intertidal mudflat habitat, 6.60 acres of low salt marsh habitat, 2.83 acres of mid-high salt marsh habitat, and 1.41 acres of native upland/wetland transitional habitat would require the excavation of approximately 125,000 cubic yards of material. The material excavated from the restoration site would be relocated to the northwest portion of the D Street Fill to raise the elevation of approximately 29.85 acres of land managed by the Service and Port of San Diego as a California least tern nesting site. The restoration of 11.03 acres of coastal wetlands also represents compensatory mitigation for impacts to jurisdictional wetlands associated with the SDG&E South Bay Substation Relocation project In addition, a construction staging area will be required on a disturbed portion of the D Street Fill and another off site construction staging area, if necessary, could be established on land immediately to the east of the D Street Fill in a currently disturbed area. Once excavation is completed, the restoration site will be planted with appropriate native vegetation and monitored and maintained for five years.

The draft EA evaluated the no action alternative and two action alternatives. The primary difference between the two action alternatives involved the way in which the material excavated from the restoration site is handled. Under Alternative B (the proposed action), the approximately 125,000 cubic yards of soil (material) to be excavated from the restoration site would be used to raise the elevation of the California least tern nesting site located on the D Street Fill to the northwest of the restoration site. Under Alternative C, the excavated material would be trucked off the site for appropriate disposal and or reuse elsewhere. For purposes of analyzing the effects of moving the material offsite, it was assumed that the material would be disposed of at the Otay Landfill in Chula Vista.

Summary of Potential Effects: A summary of the potential effects associated with each of the alternatives evaluated in the draft EA is presented below.

Summary of Potential Effects of Implementing Alternatives A, B, or C			
Resource	**Alternative A**	**Alternative B**	**Alternative C**
Biological Resources	No biological resources would be adversely affected by this alternative and the benefits associated with wetland restoration would not be realized.	Habitat and Vegetation Implementation of the restoration project would impact 0.23 acre of tidally influenced southern coastal salt marsh, 1.92 acres of nontidal disturbed coastal salt marsh, 5.32 acres of baccharis scrub and 29.85 acres of a California least tern nesting site located to the northwest of the restoration site. This impact is considered less than significant as the restoration project would result in an increase in higher quality habitat with greater ecological functionality than that being lost. Additionally, sensitive habitat and plants would be avoided/and or salvaged resulting in a less than significant impact to sensitive habitat and plants. Wildlife and Fisheries The implementation of the restoration project would result in temporary disturbances to relatively low numbers of wildlife that forage and otherwise utilize the existing restoration site. Endangered and Threatened Species and Other Species of Special Concern The habitat restoration proposed under this	Same as Alternative B

Summary of Potential Effects of Implementing Alternatives A, B, or C			
Resource	**Alternative A**	**Alternative B**	**Alternative C**
		alternative would temporarily impact some sensitive species; however, implementation of mitigation measures Bio-1 thru Bio-8 identified below would reduce these impacts to a less than significant level.	
Cultural Resources	This alternative assumes the restoration project is not implemented and there is no change from existing management programs. This alternative serves as the baseline to which all other action alternatives are compared. There would be no major changes in habitat management under this alternative. No historic properties would be affected by this alternative.	The proposed action is anticipated to have no effect to historic properties. Given the land use history of the project area (e.g., area was filled with dredge spoils), the potential for intact archaeological sites is considered low.	Same as Alternative B

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

Mitigation Measure BIO-1: Avoidance of indirect impacts to eelgrass and aquatic wildlife would be achieved through the implementation of a Storm Water Pollution Prevention Plan (SWPPP) and storm water best management practices (BMPs) to prevent erosion and sedimentation. A strategic grading process shall also be implemented to prevent actively graded areas from being exposed to tides. The process would leave a narrow berm of soil directly adjacent to the square-shaped subtidal embayment in place until all other grading is complete. The remaining berm of soil would be removed last, thus limiting the exposure of active grading to tidal action. The monitoring program would include pre-construction and post-construction eelgrass surveys in the square-shaped subtidal embayment and the immediately adjacent tidal channel for a distance of approximately 400 feet to the east and to the west. Pre-construction surveys shall document existing eelgrass populations. Post-construction surveys shall continue through the 2-year monitoring period in accordance with the NOAA Fisheries' Southern California Eelgrass Mitigation Policy to confirm no long-term indirect impacts to eelgrass populations have occurred. If impacts are identified, re-initiation of consultation with the USACE or NOAA Fisheries is required and shall be requested.

Mitigation Measure BIO-2: To avoid impacts to nesting birds, construction on D Street Fill shall be confined to the period between September 30 and February 15, unless work outside this period is authorized by the Service. In addition, biological monitoring shall be performed to reduce impacts to wildlife such as nesting birds, sea turtles, jackrabbits, and marine mammals. If an animal is believed to be at risk based on the Restoration Ecologist's judgment, construction shall be suspended until the animal moves out of harm's way on its own or through relocation measures approved by the regulatory agencies.

Mitigation Measure BIO-3: Impacts to pinnipeds protected by the Marine Mammal Protection Act and federally listed endangered East Pacific green sea turtles would be mitigated through standard construction BMPs and monitoring during construction. If an animal is believed to be at risk based on the Restoration Ecologist's judgment, construction shall be suspended until the animal moves out of harm's way on its own or through relocation measures approved by the regulatory agencies. SDG&E has completed consultation with the Service and NOAA Fisheries pursuant to Section 7 of the Federal Endangered Species Act and Section 305(b) of the Magnuson-Stevens Act regarding potential impacts to California least terns and other nesting birds, East Pacific green sea turtles, marine pinnipeds, and Essential Fish Habitat. A concurrence letter from NOAA Fisheries was received on May 14, 2015 and a Refuge Special Use Permit will be issued by the Service.

Mitigation Measure BIO-4: Restoration construction activities on D Street Fill that include excavating, grading, and hauling of materials with large equipment would occur outside of the nesting season (September 30 through February 15, unless work outside this period is authorized by the Service) to avoid disturbance to birds protected by the Migratory Bird Treaty Act or the Endangered Species Act that may nest on-site, and the numerous sensitive bird species (e.g., California least tern, Belding's savannah sparrow, light-footed Ridgway's rail) known to nest in the immediate vicinity. The harvesting and transplantation of salt marsh plants shall occur during the non-breeding season of sensitive bird species, unless authorized by the Service following verification that no nests occur in proximity to the collection area. Restoration construction activities using hand labor such as boundary staking, planting, and irrigation may be allowed within the nesting season if adequate avoidance measures are implemented. These include pre-construction surveys, non-disturbance buffers, and contractor education. Non-disturbance buffer zones would be determined in coordination with the Refuge Manager.

Mitigation Measure BIO-5: The excavation and grading work would involve the salvage and stockpiling of the nesting material layer (coarse sand and shells) prior to ground-disturbing activity associated with the restoration outside the nesting season; the raising of the existing nesting area by up to 8 feet, to a uniformly flattened area with a 20:1 slope around the entire site; and, the reapplication of the nesting material. This work would take place outside the nesting

season and would result in a net benefit to the California least tern and potentially the western snowy plover. Raising and flattening the site while creating 20:1 slopes would allow for a clear line of sight to potential predators, which is a key nest selection criterion for California least tern. In accordance with the predator management plan for the NWR, plants within the transition zone of the restoration site should not provide perches, refuge, or nesting habitat for predators of California least tern. Management actions by the Refuge to control undesirable plants or noxious weeds with the goal of maintaining an optimal nesting substrate for ground nesting seabirds and shorebirds would continue annually after project completion and prior to each nesting season.

Mitigation Measure BIO-6: Impacts to wandering skipper butterflies would be minimized by conducting focused surveys for adult wandering skipper butterflies during the flight period and selectively timed vegetation removal. Vegetation removal on the restoration site shall occur in the fall, when nectaring adults are less likely to be present to minimize impacts to this species.

Mitigation Measure BIO-7: Existing native salt marsh vegetation that occurs on the slopes of the existing square-shaped embayment would be salvaged for later replanting. Plants would be salvaged using an excavator or backhoe and would include approximately 1 foot of soil as well as the aboveground biomass of the plants. Salvaged plants would be stored on-site in basins lined with polyethylene or similar impervious plastic. Salvaged plant storage areas would be located in existing disturbed areas within the project limit of work. Plants would be watered during the storage period as directed by the Restoration Ecologist and Construction Manager.

Mitigation Measure BIO-8: To minimize impacts to sensitive plant species, a seasonal focused rare plant survey shall be conducted to document the sensitive plant populations on-site prior to construction. If sensitive plant species are identified within the proposed restoration footprint, and if avoidance is not feasible, salvage of plants and/or seeds and replanting within the restoration area would occur to the extent feasible.

Mitigation Measure Cul-1: Monitoring by a qualified archaeologist and a Kumeyaay Cultural Monitor shall be conducted as the D Street Fill area is being capped with fill material and throughout the excavation phase of the project. In the event that human remains are encountered during ground-disturbing activities, all work in the immediate vicinity shall cease and the Medical Examiner will be contacted, per the California Public Resources Code. Should the remains be identified as Native American, the Medical Examiner will contact the Native American Heritage Commission within 24 hours of identification to provide a most likely descendent to determine appropriate actions All human remains would be treated in accordance with the Native American Graves Protection and Repatriation Act (NAGPRA). Additionally, if cultural resources are encountered during ground-disturbing activities, work in the immediate vicinity shall be suspended until the discovery is assessed by a qualified archaeologist and treatment is determined.

1.0 INTRODUCTION

The U.S. Fish and Wildlife Service (Service or USFWS) proposes to restore 11.03 acres of tidally influenced coastal wetland habitat and 1.41 acres of upland transition habitat within a 12.44-acre area of the D Street Fill, located within the Sweetwater Marsh Unit of the San Diego Bay National Wildlife Refuge (NWR or Refuge). In addition, material excavated from the site could be used to raise the elevation of an existing 30-acre area that is presently managed as a California least tern (*Sternula antillarum browni*) nesting site located on the D Street Fill to the northwest of the project site.

This project is a partnership between the Service and San Diego Gas & Electric Company (SDG&E) and is proposed for the primary purpose of restoring this previously disturbed coastal wetland habitat to benefit native fish, wildlife, and plant species and provide habitat for migratory shorebirds and salt marsh-dependent species, consistent with the wildlife and habitat goal for the Sweetwater Marsh Unit as presented in the San Diego Bay NWR Comprehensive Conservation Plan (CCP) (USFWS 2006). One of the strategies identified to meet this goal is to restore intertidal wetlands in the southeastern portion of the D Street Fill.

The proposal, which SDG&E would fund and implement under a Refuge Special Use Permit to be issued by the Service, is compensatory mitigation for wetland impacts associated with SDG&E's South Bay Substation Relocation (SBSR) project to relocate and upgrade the South Bay Substation in Chula Vista to a new site on Bay Boulevard. The proposal would fulfill the applicable terms and conditions of the permits issued to SDG&E by the U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB) and California Coastal Commission (CCC).

This proposal is subject to the National Environmental Policy Act (NEPA) of 1969 (42 U.S. Code [USC] 4341 et seq.). Compliance with NEPA is required because the proposed restoration would take place on lands owned and managed by the Service, and a Special Use Permit allowing restoration activities to occur on the Refuge would be issued to SDG&E. As the lead Federal agency, the Service has prepared a draft and final Environmental Assessment (EA) in accordance with NEPA and the Council on Environmental Quality (CEQ) NEPA Regulations contained in Code of Federal Regulations (CFR) Parts 1500–1508 and the Department of the Interior Regulations for the Implementation of NEPA contained in 43 CFR Part 46 to evaluate the potential effects to the environment of implementing the proposed wetland restoration project. The EA 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 provides the persons and agencies consulted.

In 2006, the Service completed a programmatic CCP and Environmental Impact Statement (EIS)[1] to guide the management of the Refuge over a 15-year period. A Record of Decision (ROD) was signed in September 2006. This coastal restoration proposal represents step-down restoration planning for a portion of the Sweetwater Marsh Unit. This site-specific EA tiers from the programmatic EIS and ROD prepared[1] for the CCP (USFWS 2006), and the Final CCP/EIS is incorporated by reference into this document.

2.0 PURPOSE OF AND NEED FOR THE ACTION

The Service proposes to restore 12.44 acres of disturbed habitat on the D Street Fill within the Sweetwater Marsh Unit of the San Diego Bay NWR consistent with the goal, objectives, and strategies presented in the San Diego Bay NWR CCP (USFWS 2006). The D Street Fill was created in the 1960s when dredge spoils from development projects in the San Diego Unified Port District (SDUPD) were placed on native mudflat and vegetated salt marsh habitats. This proposal would restore a portion of the D Street Fill to habitats similar to those historically present on the site.

2.1 Purpose of the Action

The purpose of the proposed action is to restore a portion of the D Street Fill to intertidal wetlands consistent with the recommendations presented in the San Diego Bay NWR CCP (USFWS 2006). The restoration of 11.03 acres of coastal wetlands also represents compensatory mitigation for impacts to jurisdictional wetlands associated with the SDG&E SBSR project.

2.2 Need for the Action

The proposal to restore a portion of the D Street Fill is needed to assist the Refuge in achieving the goals and objectives of the Refuge's CCP. It is also the goal of the CCP to provide opportunities to reverse the trend of historical wetland loss in San Diego Bay by incorporating proposals for restoring, where possible, the Refuge's historical native habitats. Refuge goals include: protect, manage, enhance, and restore coastal wetland and upland habitats to benefit native fish, wildlife, and plant species within the Sweetwater Marsh Unit and support the recovery and protection efforts for the federally listed and State listed threatened and endangered species and species of concern that occur within the Sweetwater Marsh Unit (USFWS 2006).

[1] The programmatic CCP/EIS is available for review online at http://www.fws.gov/refuge/San_Diego_Bay/what_we_do/planning.html.

To satisfy mitigation requirements, SDG&E evaluated the feasibility of intertidal wetland restoration at several locations along San Diego Bay. This review of potential locations, conducted in February 2011, focused on potential sites in the vicinity of the SBSR impacts, e.g., within south San Diego Bay, with an additional site located in north San Diego County. Potential sites included:

- Pond 20, a 30-acre former solar salt evaporation pond owned by SDUPD;
- The D Street Fill, located in the San Diego Bay NWR, Sweetwater Marsh Unit, in conjunction with smaller areas within the Refuge, including restoration of 2 acres at Gunpowder Point marsh and/or 6 acres at the F & G Street Marsh;
- Improvements to on-site and adjacent drainages at the SBSR project site;
- Purchase of credits from Rancho Jamul Mitigation Bank;
- Conversion of 16 acres of high to low marsh at the Sweetwater Marsh Unit of the Refuge;
- Conversion of high marsh to low marsh in conjunction with creating approximately 7 acres of marsh within the SDG&E utility corridor from the D Street Fill south to the Living Coast Discovery Center parking lot at E Street;
- Contribution to a larger mitigation project currently in the planning process at the Otay River floodplain within the Refuge (Otay River Estuary Restoration Project);
- In lieu-fee contribution to the Service for salt pond restoration within the Refuge;
- Use of approximately 5 acres of restored sand island in San Diego Bay created as mitigation by SDUPD (South Grand Caribe Isle Mitigation Site); and
- Restoration of approximately 7 acres at Agua Hedionda Lagoon in northern San Diego County.

Based on an assessment of existing constraints and opportunities followed by discussions with agency representatives, including the Service, CCC, USACE, RWQCB and California Department of Fish and Wildlife (CDFW), the regulatory agencies determined through the permitting process that the southeastern portion of the D Street Fill was the most feasible option for satisfying the mitigation requirements associated with relocating the South Bay Substation. However, prior to initiating a proposal for restoration on the Refuge for the purpose of mitigating impacts to jurisdictional wetlands under section 404 of the Clean Water Act, it was necessary for the San Diego NWR Complex to receive an exception to the Service's Policy on the National Wildlife Refuge System and Compensatory Mitigation under the Section 10/404 Program. An exception is only granted for proposals that meet the following specific criteria:

1) The project, including the mitigation plan, is consistent with the Section 404(b)(1) guidelines, has undergone all appropriate sequencing for avoidance and minimization of impacts, and is consistent with the Service's Mitigation Policy;

2) The proposed mitigation would result in significantly increased natural resource benefits when compared with other appropriate, off-site mitigation options; and

3) The proposed mitigation plan would support the mission of the National Wildlife Refuge System (NWRS), is consistent with the endangered species and migratory bird purposes of the San Diego Bay National Wildlife Refuge, and will assist in the achievement of the habitat and species goals and restoration objectives and strategies addressed in the Refuge's Comprehensive Conservation Plan.

In November 2014, the proposal to restore a portion of at the D Street Fill as compensatory mitigation for off-site impacts was determined to be consistent with the Section 404(b)(1) guidelines. In addition, the proposed restoration would support the mission of the NWRS, be consistent with San Diego Bay NWR goals for restoring habitat to support listed species and migratory birds, implement a habitat strategy included in the San Diego Bay NWR CCP (USFWS 2006), and result in significantly increased natural resource benefits when compared to other off-site mitigation options. With concurrence from the Deputy Director of the U.S. Fish and Wildlife Service, Assistance Regional Director of Ecological Services, and Assistant Regional Director of Refuges, the Regional Director approved the project-level exception to Service Policy.

2.3 Decision(s) to Be Made and Applicable Authorities

The analysis presented in the final EA provide the basis for the Service's determination to implement the proposed action, as well as the basis for determining that the proposed action would not constitute a major Federal action significantly affecting the quality of the human environment. Our decision to prepare a Finding of No Significant Impact (FONSI) is supported by the final EA.

The authority for this action is the National Wildlife Refuge Administration Act, as amended (16 USC 668 §§ et seq.).

Other decisions, approvals, and/or permits that have been or would be obtained prior to project implementation include:

- CCC Coastal Development Permit
- USACE Clean Water Act (CWA) Section 404 Individual Permit

- San Diego RWQCB CWA Section 401 Water Quality Certification
- Service Special Use Permit and Section 7 Informal Consultation
- National Marine Fisheries Service (NMFS) Section 7 Informal Consultation
- National Oceanic and Atmospheric Administration (NOAA Fisheries) Essential Fish Habitat Consultation

The following authorities, which apply to the proposed action, have been considered in preparing this EA:

- Coastal Zone Management Act of 1972, as amended
- National Wildlife Refuge Administration Act, as amended (16 USC 668 §§ et seq.).
- National Wildlife Refuge System Improvement Act of 1997 (Public Law [P.L.] 105-57)
- 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) (CWA)
- 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.)
- Magnuson-Stevens Act
- Marine Mammal Protection Act
- Executive Order 11988, 24 May 1977, Floodplain Management
- Executive Order 11990, 24 May 1977, Protection of Wetlands
- Executive Order 12898, 11 February 1994, Environmental Justice

2.4 Public Involvement

Public Review and Comment

To initiate public review of the draft EA, a legal notice was published in the San Diego Union Tribune. The notice indicated where the document is available for review and when and where comments should be provided. Comments on the draft EA were solicited from various local, State, and Federal government agencies, tribal governments, non-governmental organizations, and the public during the 30-day comment period (July 29, 2015 to August 27, 2015). Notices

were sent to all federally recognized tribal governments in San Diego County (Appendix B) and other interested parties. The draft EA distribution list is provided in Appendix C. The draft EA was also sent to the California State Clearinghouse (SCH#15071069) for distribution to interested State agencies. Five comment letters were received during the public comment period. These letters and our responses are provided in Appendix D. Underlined text in the Final EA represents changes made between the draft EA and Final EA in response to comments received during the public comment period.

The comments received during the public review period have been considered by the Service during our analysis of the proposed action and alternatives, in determining the effects to the human environment, and in selecting the preferred alternative for implementation. Agency consultation and coordination with CCC, USACE, SDUPD, and NOAA was also conducted and considered as part of our decision making process.

3.0 PROPOSED ACTION AND ALTERNATIVES

3.1 Introduction

The CEQ regulations implementing NEPA (Section 1508.9 (b)) state 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.

A reasonable range of alternatives generally includes several “action” alternatives, as well as the “no action” alternative (NEPA Section 1502.14(d)). Under the No Action Alternative, the proposed action would not be implemented and the project site would continue to be managed in its current state. The no action alternative provides a description of what would happen if no action is taken, and it also serves as the baseline to which all other action alternatives are compared.

Two “action” alternatives and the no action alternative were developed for assessment of environmental compliance under NEPA. The Service proposes to implement Alternative B, the proposed action.

3.2 Proposed Action

3.2.1 Description

The Service, in partnership with SDG&E, proposes to restore 11.03 acres of tidally influenced coastal wetland habitat and 1.41 acres of upland transition habitat within a 12.44-acre area of the D Street Fill, located within the Sweetwater Marsh Unit of the San Diego Bay NWR. Under the proposed action, the material generated from the excavation required to restore these coastal wetlands would be placed just to the northwest of the project site on approximately 29.85 acres of the D Street Fill, which is managed as a California least tern nesting area. Additionally staging areas will occur both within the D Street Fill and off site if necessary in a disturbed area adjacent to D Street Fill. The complete project boundary is identified in Figure 1.

The proposed restoration site is located in the southeastern corner of the D Street Fill in Chula Vista, near its border with National City, San Diego County, California. The restoration site is located south of the Sweetwater River flood control channel, west of Interstate 5 (I-5) and east of the open water portion of San Diego Bay. Ownership of the D Street Fill is divided between SDUPD and the Service, which jointly manage the northwestern/central portion of the site to support California least tern nesting. In addition, much of the D Street Fill, including the project site, is located within an area designated as western snowy plover (*Charadrius nivosus nivosus)* critical habitat for the recovery of this federally listed threatened species. Land ownership and critical habitat boundaries are presented in Figure 2. Portions of the perimeter of the D Street Fill have been restored to intertidal and subtidal habitat over the last few decades as a result of the following wetland mitigation projects that occur adjacent to or in the vicinity of the proposed project site:

- Marisma de Nacion, 1990: intertidal salt marsh restoration to the east (Refuge property)
- Naval Facilities Engineering Command, 1990: open water creation (square-shaped subtidal embayment) along the southeast boundary (Refuge property)
- National City Wharf Extension Mitigation Project, 2004: intertidal salt marsh restoration to the north (SDUPD property)
- D Street Habitat Mitigation Site for the L Ditch Habitat Remediation Project, 2011: open water and western snowy plover nest habitat enhancement to the northwest (SDUPD property).

Figure 1 Regional Location and Project Features

8.5 x 11

Figure 2 Land Ownership

8.5 x 11

In addition, in 2009 with funding from a North American Wetlands Conservation Act grant, the Service in partnership with the California Waterfowl Association implemented the D Street Nesting Site Enhancement Project, which lowered a previously existing berm at the southwest end of the D Street Fill to improve potential western snowy plover chick access between potential nesting areas on the fill and foraging areas within the intertidal mudflat zone in San Diego Bay.

The proposed action would restore a variety of wetland and transitional habitats, although the primary habitat to be restored is southern coastal salt marsh, including low and mid-high salt marsh habitat. Fill placed on the site decades ago would be excavated down to elevations appropriate for supporting a diverse mix of intertidal habitats (i.e., mudflat, low marsh, mid-high marsh), as well as native wetland/upland transitional habitat. A more natural edge would be created along the shoreline of the existing square-shaped subtidal embayment through the removal of the steep slope and creation of an open water area that gradually transitions to mudflat and low marsh. Restoration would provide habitat for a diverse assemblage of plants and animals, including Belding's savannah sparrow (*Passerculus sandwichensis beldingi*), wandering skipper (*Panoquina errans*), and light-footed Ridgway's rail (*Rallus obsoletus levipes*). Open water habitat and tidal channels would provide foraging opportunities for fish, invertebrates, California least tern, shorebirds, and wading birds. The high productivity associated with salt marshes from vascular plants and algae would be maximized, which would provide energy for higher-order consumers.

Coastal salt marsh is a highly productive association of herbaceous and suffrutescent salt-tolerant hydrophytes that form a moderate to dense cover and can reach a height of 3 feet. Coastal salt marsh plants are distributed along distinct elevation zones depending on such environmental factors as frequency and length of tidal inundation, salinity levels, and nutrient status (MacDonald 1977). A minor amount of subtidal open water habitat would be created along the shoreline of the square-shaped subtidal embayment and within the center of the tidal channels. The tidal channels would meander through the low salt marsh zone, and open water would transition to mudflat habitat. High salt marsh would be established within the highest elevations and outer perimeter of the restoration site, and would transition downslope into mid-elevation salt marsh. Transitional habitat would be established along the perimeter of the restoration site, as elevations exceed the range of the highest salt marsh plants. In addition, a transitional upland buffer zone would be maintained along the eastern boundary of the mitigation area to separate the restoration site from potential burn-ash contamination to the east. The mitigation area was also designed to accommodate a tidal channel connection with a future restoration project to the west, if desired.

With possible sea level rise of approximately 24 inches by 2050 according to the CCC's *Draft Sea-Level Rise Policy Guidance* (CCC 2013), mudflat and low marsh would likely transition over time to subtidal habitat, and mid-high marsh would likely transition to mudflat and low marsh. Thus, restoration would provide maximum diversity and productivity in the short term. In the long term, some marsh habitats may be lost, with the system dominated by subtidal habitat (benefiting fish and invertebrates) and mudflat (benefiting primarily shorebirds). It is anticipated that some low marsh habitat would persist, providing habitat for such species as light-footed Ridgway's rail.

Table 1 shows the proposed acreage of each habitat to be created, resulting in the creation of 12.44 acres of wetland and upland habitat. Figure 3 depicts the Final Wetland Restoration Plan.

Table 1
Restored Habitat Acreages

Restoration Concept	Target Habitat	Acres
Maximum Salt Marsh Diversity and Modification of Existing Square-Shaped Subtidal Embayment	Low Salt Marsh	6.60
	Mid-High Salt Marsh	2.83
	Mudflat	0.98
	Open Water	0.62
	Upland	1.41
	Total Restoration Area	12.44

Implementation of the restoration effort would include demarcation of the restoration limits, removal and disposal of nonnative or undesirable vegetation, excavation and grading to restore tidal hydrology and drainage patterns, reuse of excavation soils, decompaction, site preparation, and planting and seeding. To avoid indirect impacts (e.g., noise) to sensitive wildlife species during the bird breeding season, all grading on D Street Fill associated with the restoration project would be conducted between September 30 and February 15. To avoid potential sediment and erosion issues while working during the rainy season, excavation and hauling work would be postponed if a greater than 40% chance of 0.25 inch of precipitation within a 24-hour period was forecast. Erosion-control measures would be implemented in accordance with the Storm Water Pollution Prevention Plan (SWPPP) during all phases of construction. Planting and seeding of native species should occur during the fall/winter months to take advantage of winter rains to maximize germination success. An implementation schedule is proposed as shown in Table 2. The final implementation and monitoring schedules may vary based on agency review and approval.

Figure 3 Proposed Restoration

8.5 x 11

Table 2
Proposed Implementation Schedule

Task	Completed By
Approved Final Restoration and Monitoring Plan	November 2014
Demarcation of Mitigation Limits and Staging Areas	Fall 2015
Excavation and Contour Grading	Fall 2015/Winter 2016
Site Decompaction	Fall 2015/Winter 2016
Initial Container Planting and Seeding	Fall 2015/Winter 2016
Complete 120-Day Plant and Hydrology Establishment Period	Spring 2016
5-Year Maintenance and Monitoring Period	2016–2020

A construction management and compliance team would be assembled to oversee successful implementation of the project and compliance with contract and permit requirements. The construction management and compliance team would include the following roles:

- Refuge Manager: The Refuge Manager for the San Diego Bay NWR, who would coordinate with the Construction Manager and Restoration Ecologist. Oversight of the restoration activities during construction and throughout the 5-year maintenance and monitoring period to ensure compliance with the conditions of the Special Use Permit and applicable Service regulations would be the responsibility of the Refuge Manager. For issues related to the wildlife and habitat protection and compliance with permit conditions and in relation to any other activities taking place on or affecting Refuge lands, the Refuge Manager has the ultimate authority to suspend or redirect construction activity.
- Construction Manager: An individual experienced in construction, grading, environmental compliance, and contract management, who would operate as SDG&E's responsible person and on-site decision maker. All review and approval of work, as well as addressing potential change orders, is ultimately the responsibility of the Construction Manager.
- Restoration Ecologist: An individual experienced in wetland and salt marsh restoration design and implementation, who would serve as the technical restoration expert during construction and throughout the 5-year maintenance and monitoring period. The Restoration Ecologist would be the primary reviewer of the work, contractor submittals, requests for changed methods, and similar technical information, and will provide technical direction on biological and restoration topics as required by permits or as needed during construction. Though the Restoration Ecologist is the primary technical biological and restoration expert on-site and is responsible for providing

recommendations to the Construction Manager, the final decision-making authority remains with the Construction Manager in coordination with the Refuge Manager.

Construction plans would incorporate the most current existing restoration site information available and be in accordance with all aspects of the approved Restoration Plan and permit conditions required by the permitting agencies. Construction plans would include a restoration site plan showing proposed work areas and final site layout, special-status plant salvage and relocation guidelines (if necessary), grading plans, construction details, and planting plans.

3.2.2 Construction Methods

The earthwork on the D Street Fill site required to implement the proposed action would occur within an approximately 4.5-month period between September 30 and February 15. Generally, construction would consist of:

- Equipment mobilization, demobilization, access, and staging areas
- Clearing and grubbing existing vegetation
- Earthwork within the Proposed action footprint to lower elevations
- Reuse of soils
- Planting of salt marsh and transitional habitats

Mobilization, Demobilization, Access and Staging Areas: It is anticipated that the contractor can mobilize all necessary equipment within a 1-week time frame. Estimated equipment needed for construction is presented in Table 3. All equipment would arrive by truck and enter the site through an approved access route. The construction access route is illustrated in Figure 1 and described as follows: access Marina Way south to the vacant dirt and gravel-covered area slightly north of Bayshore Bikeway; east parallel to the Bayshore Bikeway to a gate leading to an unpaved road that serves as SDG&E's utility corridor; south along the utility corridor crossing the bike path and crossing the Sweetwater River flood control channel via an SDG&E one-lane concrete bridge; west into the fenced and gated D Street Fill and south along an existing unpaved road to the restoration site. A flagman would be posted at either end of the initial east-west portion of the Bayshore Bikeway with another posted at the north-south access crossing of the bikeway during movement of construction equipment to protect bicyclists and pedestrians. A flagman would also be present where the construction access route crosses the bikeway during commute hours when construction workers are traveling to or from the construction site. Vehicular travel would be restricted to the fewest vehicles necessary to deliver the required equipment. All deliveries would be coordinated with the Refuge Manager prior to their arrival. All access routes and staging areas would be reviewed by the Restoration Ecologist and approved by the Construction Manager and Refuge Manager prior to the start of mobilization.

Table 3
Alternative B Preliminary Equipment Analysis

Equipment	Quantity	Power Rating	Hr/Day	Days	Total Hours
Bulldozer	2	280 hp	10.0	50.0	1000.0
Excavator (3 cyd)	2	300 hp	10.0	50.0	1000.0
Dump Truck (20 cyd)	4	350 hp	10.0	50.0	2000.0
Water Truck (4000 g)	1	300 hp	10.0	50.0	500.0

cyd = cubic yards per day; g = gallons; hp = horsepower; hr/day = hours per day

Staging areas would be located in disturbed areas on the D Street Fill. Initially, the contractor may stage equipment and supplies within the 12.44-acre excavation footprint of the restoration site, as the entire site would be disturbed eventually. Other staging areas, occupying up to 0.04 acres, could be established adjacent to the site (Figure 1), but would be limited to existing disturbed areas such as access paths and maintenance roads. The least tern nesting area to the northwest of the project site could also be considered for staging. All staging areas identified outside the project boundary would require approval from the Refuge Manager. The contractor may choose to erect temporary fencing to protect equipment and supplies; however, as the entire site is fenced and gated, temporary fencing may not be necessary.

All areas outside approved limits of work would be fenced with temporary orange construction fencing to prevent impacts from construction. All fueling of construction equipment would be conducted within the designated staging area and within a containment basin with an impervious liner to contain inadvertent spills. An exception to this would be the fueling of pumps should they be necessary to control groundwater within the grading area. Other protective measures such as the need for maintaining adequate emergency spill response equipment on site would be identified in the contractor's SWPPP.

At the end of construction, all equipment would be demobilized. Demobilization of equipment would use the same route as mobilization. Staging areas, access routes, and other disturbed areas would be decompacted and restored to preconstruction conditions or as specified in the construction documents.

Clearing and Grubbing: The 12.44-acre restoration site would be cleared and grubbed prior to the start of grading. All cleared and grubbed material would be transported off-site and disposed of in a legal manner.

Existing native salt marsh vegetation that occurs on the slopes of the square-shaped embayment would be salvaged for later replanting. Plants would be salvaged using an excavator or backhoe

and would include approximately 1 foot of soil as well as the aboveground biomass of the plants. Salvaged plants would be stored on-site in basins lined with polyethylene or similar impervious plastic. Salvaged plant storage areas would be located in existing disturbed areas within the project limit of work. Plants would be watered during the storage period as directed by the Restoration Ecologist and Construction Manager.

Earthwork: Earthwork includes soil excavation, grading to prepare the restoration site for salt marsh mitigation installation, and removal of fill material. Proposed grading is intended to improve the physical and hydrological conditions required for the establishment of salt marsh habitat. Grading would improve drainage patterns, expand areas appropriate for salt marsh habitat creation by lowering site elevations, and establish primary tidal flow and low-flow channels within the restoration site. As the proposed site consists of 4 to 8 feet of fill material, substantial grading would be required to restore tidal flushing and subtidal and intertidal mudflat and salt marsh habitat areas. Less grading would be needed to transition from wetland to upland habitat areas.

The proposed grading plan is presented in Figure 4. Subtidal habitat would be excavated to below +0.75 feet mean lower low water (MLLW) and would slope gradually (4% to 5%) to mudflat (+0.5 to +3 feet MLLW), which would slope gradually (17% to 22%) to low marsh (+3 to +5.3 feet MLLW). Once the low marsh reaches an elevation of approximately +4 feet MLLW, the marsh plain would remain mostly flat until transitioning to +5.3 feet and above into high marsh. Transition zone slopes would be relatively abrupt, ranging from 3:1 to 4:1 slopes, to maximize wetland acreage.

Earthwork is the major construction activity of the proposed action. The proposed action requires the excavation of approximately 125,000 cubic yards of soil (material). The success of wetland restoration depends greatly on the accuracy of the final grading in achieving the desired elevations for different wetland habitats. Grades would be checked frequently by the Project Engineer and the contractor must keep detailed records for inspection. The Restoration Ecologist would closely observe all grading, review grade checks, and provide recommendations as necessary for successful implementation.

It is anticipated that earthwork excavation would be accomplished using primarily excavators and a bulldozer. Excavated material would be loaded into dump trucks for re-use. As the elevations of the proposed channel network are approximately +0.75 feet MLLW, some wet material may be encountered. Provisions for dewatering are presented next in the Re-use of Soils section.

Figure 4 Proposed Grading Plan

8.5 x 11

Re-use of Soils: Material generated from the excavation of the intertidal wetland restoration site would be re-used on the D Street Fill site. The excavated material would be trucked on unpaved access roads within the D Street Fill. Placement of the excavated soil would raise by approximately 8 feet the elevation of a 29.85-acre area of the D Street Fill managed as a California least tern nesting area (Figure 5). The coarse sand and shells that currently cover the nesting area (representing approximately 25,797 cubic yards of material) would be scraped and stockpiled prior to on-site material re-use. Stockpiled soils would be protected with appropriate best management practices (BMPs) (e.g., silt fences, straw wattles) until such time as they are placed on top of the excavated sediment. The material excavated from the restoration site would then be graded according to Figure 5. When restoration earthwork is complete, the stockpiled coarse sand and shell material would be replaced at the original thickness. The resulting configuration would be a flat pad approximately 8 feet higher than existing ground, with 20:1 slopes on all sides. The fill area was designed to provide a flat nesting site for least terns with a clear line of sight to any potential predators, which is a nesting site selection criterion. The 20:1 slopes of the new nesting area were designed to provide an appropriate slope for western snowy plover chicks, should this species choose to nest on-site. The Restoration Ecologist, with oversight by the Refuge Manager, would oversee and guide the final grades and placement of stockpiled soil.

The placement of excavated material on the least tern nesting site would provide a means of drying wet soils. Wet soils would be spread and allowed to dry before additional material is placed on top.

It is estimated that four dump trucks would be employed for on-site soil re-use activities. Approximately 5 minutes would be required to fill each truck using either an excavator or front loader. One round trip for each truck may take up to 20 minutes, requiring four dump trucks to maintain continuous soil transport. Assuming a 50-hour work week, the estimated truck traffic is presented in Table 4 for three potential dump truck sizes.

Table 4
Alternative B Truck Traffic Analysis*

Truck Size (cubic yards)	Total # trips	Total Hours	Trucks/Day	Total Weeks
12	10000.0	833.3	120.0	16.7
18	6666.7	555.6	120.0	11.1
20	6000.0	500.0	120.0	10.0

*Analysis assumes: 120,000 cubic yards would be exported;
5 minutes per truck fill; and
50 hours per week of truck operation.

Figure 5 Proposed Grading Plan Soil Re-Use Site

8.5 x 11

Dust control would be required for all phases of material management. It is anticipated that a water truck would operate continuously, wetting access roads and the 12.44-acre restoration site.

The disturbance associated with the redistribution of soils at the least tern nesting area has the potential to increase the emergent weed crop in subsequent seasons. The Refuge presently manages the site to maintain optimal nesting conditions for ground nesting seabirds that prefer sparse and low growing vegetative cover. In coordination with the Port of San Diego, the nesting site is scraped annually with heavy equipment and is also treated with targeted herbicide application and hand thinning to control undesirable vegetation and to maintain the preferred nesting conditions for least terns at the nesting site.

Measures have been incorporated into the scope of the project to ensure that proper nesting substrate is present on the newly graded surface post project. One such measure requires the contractor to remove and store the top 8 inches of soil that is presently within the main tern nesting area. Once this top layer of soil is set aside, the reuse site would be filled with dried excavated soils and graded to meet the elevations and slope gradients indicated in Figure 5. Once the site has been properly prepared, it will be capped with the stored original top layer of soil. The contractor will also be instructed not to apply the stored nesting subtract to the reuse site until the soils deposited from the restoration site have dried and are compacted and contoured per the final construction plans.

Preserving the current top layer of soil will ensure that the post project nesting substrate will continue to be composed of coarse sands mixed with shell material; substrate suitable for least tern nesting. This action is also intended to conserve the propagules of sensitive native coastal dune associated low growing plants such as coast woolyheads (*Nemacaulis denudata*) and Nuttal's lotus (*Acmispon prostratus*) that are presently on site.

The Refuge in coordination with the Port of San Diego will continue to manage the newly configured nesting area for use by ground nesting seabirds and shorebirds by conducting annual maintenance of vegetation cover and maintaining the site in a condition suitable for ground nesting birds.

Planting of Salt Marsh and Transitional Habitats: After the final grading is completed and accepted, planting of marsh and transition zone habitats would commence. Proposed restored habitats are divided into habitat zones: subtidal, mudflat, low marsh, mid-high marsh, and transition. Low, mid-high salt marsh and transition habitats would be planted. Subtidal and mudflat habitats would be intended to be unvegetated. Subtidal habitats may be subject to natural recruitment of eelgrass (*Zostera marina*) over time but no intentional planting of eelgrass is

planned as part of this project. Detailed descriptions of planting plans for each habitat zone are provided below and illustrated in Figure 6.

Low Marsh. The restored low marsh areas would be planted exclusively with California cordgrass (*Spartina foliosa*). It is proposed that cordgrass be obtained from existing low marsh habitat in Sweetwater Marsh to maintain genetic integrity. Low marsh habitat would be accomplished by collecting and planting cordgrass root divisions, or "plugs." Cordgrass plugs are obtained by dividing existing stands of cordgrass into small divisions composed of two to five growing stems and attached rhizomes. Each plug would_consist of above-ground shoots, roots and native soil. Each plug would be approximately 4 inches in diameter and 6-8 inches deep and shall be collected by hand using a narrow straight shovel or trowel. No mechanical collection shall be allowed. Existing patches will be "thinned" so as no more than 10% of a given area is harvested. The Restoration Ecologist will oversee harvesting of plugs. Harvesting will be allowed within the existing Marisma de Nacion restoration immediately east of the restoration site on D Street fill or from other sites within the Sweetwater Marsh unit of the Refuge. Harvest areas will be determined in the field by the Restoration Ecologist prior to harvesting so that condition of no more than 10% disturbance to existing cordgrass patches is achieved. All plugs shall be transplanted within 24 hours of collection. All collection and transplantation shall be overseen by the Restoration Ecologist. Cordgrass plantings would receive tidal inundation and would not require irrigation. All cordgrass plantings would be spaced at 6 feet on center (o.c.) (Table 5). All source locations of cordgrass plugs would be from the nearby vicinity in Sweetwater Marsh. The Refuge has a policy of not allowing plugs of soil to be moved between wetland areas to avoid the potential for the unintentional spread of invasive exotic benthic organisms between wetlands.

Mid-high marsh. The mid-high marsh zone would be planted with equal proportions of saltwort (*Batis maritima*), coastal saltgrass (*Distichlis spicata*), alkali heath (*Frankenia salina*), fleshy jaumea (*Jaumea carnosa*), sea lavender (*Limonium californicum*), shoregrass (*Monanthochloe littoralis*), Parish's pickleweed (*Athrocnemum subterminale*), and estuary sea-blite (*Suaeda esteroa*). All species would be propagated from cuttings or seed harvested from the existing salt marshes in the vicinity of the restoration site (i.e., San Diego Bay). Individual plants would be grown to suitable size in 2.25-inch-wide, 3-inch-deep "rosepot" liners (Table 5). All rosepots would be planted at 3 feet on center spacing and irrigated as described below in the Irrigation section.

Transition Zone. The upland transition zone would be planted with equal proportions of alkali weed (*Cressa truxillensis*), saltgrass, shoregrass, and Parish's pickleweed (Table 5). The upland transition zone would also be seeded with the two rare plants occurring within the restoration site

impact area: coast woolly-heads (*Nemacaulis denudata* var. *denudata*) and beach goldenaster (*Heterotheca sessiliflora sessiliflora*). These species occur within the scrub habitat on the D Street Fill and are expected to tolerate the edge conditions of the upland transition zone. In accordance with the predator management plan for the Refuge, plants within the transition zone should not tend to provide perches, refuge, or nesting habitat for predators of California least tern. Therefore, the species chosen for this plant palette are those that would remain low in stature. All species would be propagated from cuttings or seed harvested from existing marshes in the vicinity of the restoration site. Individual plants would be grown to suitable size in rosepot liners. Supplemental seeding of the same species would also occur in the transition zone. All rosepots would be planted at 3 feet on center spacing and irrigated as described below in the Irrigation section.

Plant Layout and Installation: To ensure adequate establishment and balanced representation of each species within the mid-high marsh and transition zones, plantings would occur in groupings. Specifically, each species would be planted in groupings of seven to nine individuals in a reasonably random grouping pattern within the planting zone (Figure 6). To ensure that large monoculture plant groupings do not result, each species grouping would not occur immediately adjacent to another grouping of the same species. This method should result in a mosaic of species within each habitat zone that mimics the distribution of species in natural marsh systems.

The majority of plant material would be provided in rosepot liners. All plants would be planted in holes of sufficient depth to accommodate the root mass and any attached soil. Holes would then be back-filled with native soil. Care would be taken to ensure that the entire root mass is buried and not exposed to air and sunlight.

Irrigation: The goal of low marsh restoration is to grade to the +3.0 to +5.3 feet MLLW range, which is inundated by diurnal tides. Therefore, much of the restoration site should not require irrigation. However, the higher marsh and transition zones would be less influenced by tides. In portions of the restoration site receiving infrequent or no tidal inundation, supplemental watering would be required for at least the first full year after planting. Watering during the installation phase and 5-year maintenance program is proposed through a water truck and watering by hand. There are suitable access locations adjacent to the restoration site where a water truck could park. Spray nozzles and/or hoses would need to be extended to reach the restoration site.

Watering during the nesting bird season (February 15 - September 30) would be conducted in conjunction with the Refuge Manager and in accordance with Special Condition #2 of CCC CDP E-11-010. As presented previously, this condition requires nesting bird surveys within 500 feet of proposed construction activities and restricts construction activities to within 500 feet of any

Figure 6 Typical Planting Layouts

11 x 17

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Table 5
Plant Species to Be Planted within Each Habitat Zone with Propagule Form and Method of Establishment

Habitat Type	Elevation (Feet MLLW)	Acres/ Spacing	Plant Species (Scientific Name)	Propagule Form and Method of Establishment
Low Marsh	+3 to +5.3	6.60 acres/ 6 feet on center (o.c.)	*Spartina foliosa*	Rooted plugs Allow to naturalize
Mid-High Marsh	+5.3 to +7.5	2.83 acres/ 3 feet o.c.	*Batis maritima* *Distichlis spicata* *Frankenia salina* *Jaumea carnosa* *Limonium californicum* *Monathochloe littoralis* *Arthrocnemum subterminale* *Suaeda esteroa*	Rosepots Allow to naturalize
Transition Zone	+7.5 and higher	1.41 acres/ 3 feet o.c.	*Cressa truxillensis* *Distichlis spicata* *Monathochloe littoralis* *Arthrocnemum subterminale* *Heterotheca sessiliflora* ssp. *sessiliflora* *Nemacaulis denudata* var. *denudata*	Rosepots and seed Allow to naturalize

o.c. = on center

active nest. The Refuge Manager has indicated that watering, as proposed, may be allowable during the nesting season provided that a qualified avian biologist has determined that such activity is not disruptive to nesting birds, in particular nesting least terns.

The high marsh would likely need supplemental watering for the first year but should quickly become established and receive adequate water from the higher high tides. For the upland transitional habitat, it is expected that supplemental watering would only be needed during the first 2 years after restoration installation. The lower-elevation habitats (mid-marsh and low marsh) would be regularly inundated by tidal waters and should not need supplemental watering. A goal of the mitigation is to have the restoration site persist without temporary irrigation for at least 2 years before the mitigation program is considered complete. Special Condition #10 of the CCC CDP E-11-010 stipulates that success criteria must be met for 3 years without any remediation except weeding and debris removal. Irrigation of new plantings would be most critical within the 120-day plant establishment period and would become less critical as plants develop greater root mass over time

120-day Plant and Hydrology Establishment Period: The installation contractor would be responsible for maintenance of the planted marsh and transition zone during the 120-day plant and hydrology establishment period. During this period, the contractor must replace dead plants periodically to achieve 100% survival of planted species. The Restoration Ecologist would evaluate the site at least once per month and inform the contractor of required remedial measures.

Mitigation and Monitoring Program: A wetland mitigation and monitoring program would take place over a 5-year period (Table 6) following successful completion of the 120-day plant and hydrology establishment period. Attainment of the final success standards is expected to result in the creation and establishment of salt marsh habitat at the end of this 5-year period; however, the ecosystem may continue to evolve and mature beyond this timeframe. The Restoration Ecologist would provide direction and oversee the work of the maintenance and monitoring teams throughout the 5-year period. Attainment of final success standards is defined under Special Condition #10 of the CCC CDP E-11-010 which stipulates that success criteria must be met for 3 years without any remediation except weeding and debris removal.

Table 6
Monitoring Schedule

Task	Completed
Construction/Implementation Monitoring	Fall/Winter 2015/2016
120-Day Plant and Hydrology Establishment Period	Spring 2016
Qualitative Monitoring	Quarterly Years 1 and 2 Semi-Annually Years 3 and 4 (late winter and late summer) Annually Year 5 (late summer)
Quantitative Monitoring	Annually Years 1–5 (late summer)
Photographic Documentation	Semi-Annually Years 1–4 Annually Year 5
Performance Standards and Success Criteria	Quarterly Years 1 and 2 Semi-Annually Years 3 and 4 (late winter and late summer) Annually Year 5 (late summer)
CRAM Assessment	Annually Years 1, 3, and 5

CRAM = California Rapid Assessment Method

3.3 Other Alternatives Considered in the Draft EA

3.3.1 No Action Alternative (Alternative A)

Under the No Action Alternative, 12.44 acres of restoration on the D Street Fill would not be implemented as part of the mitigation requirements for the SDG&E SBSR project and the

potential for changes to the adjacent California least tern nesting habitat in association with restoration would not occur. The site would instead continue to be managed by the Refuge in its existing condition. However, because the site is identified in the Refuge CCP for future wetland restoration, it would eventually be restored or enhanced to achieve Refuge purposes (USFWS 2006).

3.3.2 Alternative C

Alternative C differs from Alternative B only in the re-use of excavated material. All other construction methods are identical to Alternative B as described above and are not repeated here.

Under Alternative C, soils excavated during construction of the tidal wetland on the D Street Fill would be trucked off-site to a legally acceptable but not yet determined site. For the purposes of this EA, it is assumed that the approximately 125,000 cubic yards of excavated material would be disposed at the Otay Landfill in Chula Vista. This landfill has indicated the willingness to accept clean fill as daily cover. The availability of this landfill during the construction of the D Street Fill wetland would need to be verified at the time of construction, should this alternative be selected as the preferred alternative. The Otay Landfill is located approximately 12 miles from the D Street Fill resulting in an approximately 24-mile round trip. Access from the D Street Fill would be north and west parallel to the Bayshore Bikeway; north on Marina Way to Marina Boulevard/East 24th Street; south on I-5 to SR 54 east; south on Interstate 805 (I-805) to Main Street; and east on Main Street to Maxwell Road north. Like Alternative B, a flagman would be posted at either end of the initial east-west portion of the Bayshore Bikeway with another posted at the north-south access crossing of the bikeway during movement of construction equipment to protect bicyclists and pedestrians. A flagman would also be present where the construction access route crosses the bikeway during commute hours when construction workers are traveling to or from the construction site.

It is estimated that each round trip would take approximately 60 minutes, requiring a minimum of 12 dump trucks in continuous operation over an 8- to 10-hour workday to maintain a frequency of one truck filled each 5 minutes.

3.4 <u>Alternatives Development Process</u>

The alternatives development process was designed to allow consideration of the widest possible range of alternatives. Numerous conceptual designs were developed, to ensure the objectives of the Refuge were being met. These included (1) a sea level rise option that would create higher-elevation salt marsh that could transgress (transition) into lower-elevation marsh and mudflat with predicted climate change and sea level rise, and (2) a maximum diversity option that

included a diverse mix of subtidal, intertidal mudflat, intertidal low, mid-high salt marsh and transition from wetland to upland habitats. The Service identified the maximum diversity option as the preferred design. After many iterations, in November 2014, a Final Restoration Plan was approved by the CCC as required under the Coastal Development Permit issued for the SBSR. In addition to the design options evaluated for the currently proposed restoration site, a number of alternative locations for restoration were evaluated early in the review process as described in Section 2.2.

4.0 AFFECTED ENVIRONMENT

4.1 Introduction

The discussion included in this section provides 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, contaminants, greenhouse gas (GHG) emissions, sea level rise, environmental justice, geology and soils, hydrology, water quality, noise, traffic, public access and recreational opportunities, and cumulative effects) are discussed in detail in this section. The following topics will not be addressed in the EA based on the initial evaluation of impacts of the proposed action by the Service: topography, visual quality, agricultural resources, mineral resources, public utilities and easements, odors and vectors, economics and employment, and land use. Additional information regarding the affected environment within and surrounding the D Street Fill is provided in the San Diego Bay NWR *Final Comprehensive Conservation Plan/ Environmental Impact Statement* (USFWS 2006).

4.2 Air Quality

Air quality is defined by the concentration of pollutants in relation to their impact on human health. Concentrations of air pollutants are determined by the rate and location of pollutant emissions released by pollution sources, and the atmosphere's ability to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, and sunlight. Therefore, ambient air quality conditions within the local air basin are influenced by such natural factors as topography, meteorology, and climate, in addition to the amount of air pollutant emissions released by existing air pollutant sources.

The project is located in the south coastal portion of San Diego County, and within the San Diego Air Basin (SDAB). The SDAB is a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean to the west and high mountain ranges to the east. The topography in the SDAB region varies greatly, from beaches on the west, to mountains and then

desert to the east. The climate of the SDAB is characterized by warm, dry summers and mild winters. One of the main determinants of its climatology is a semi-permanent high-pressure area in the eastern Pacific Ocean. This high-pressure cell maintains clear skies for much of the year. When the Pacific High moves southward during the winter, this pattern changes, and low-pressure storms are brought into the region, causing widespread precipitation. During fall, the region often experiences dry, warm easterly winds, locally referred to as Santa Ana winds, which raise temperatures and lower humidity, often to less than 20%.

A common atmospheric condition known as a temperature inversion affects air quality in the SDAB. During an inversion, air temperatures get warmer rather than cooler with increasing height. Inversion layers are important for local air quality, because they inhibit the dispersion of pollutants and result in a temporary degradation of air quality. The pollution potential of an area is largely dependent on a combination of winds, atmospheric stability, solar radiation, and terrain. The combination of low wind speeds and low-level inversions produces the greatest concentration of air pollutants. On days without inversions, or on days of winds averaging over 15 miles per hour, the atmospheric pollution potential is greatly reduced.

Individual air pollutants at certain concentrations may adversely affect human or animal health, reduce visibility, damage property, and reduce the productivity or vigor of crops and natural vegetation. Six air pollutants have been identified by the U.S. Environmental Protection Agency (EPA) as being of concern: ozone (O_3); carbon monoxide (CO); sulfur oxide (SO_X); nitrogen dioxide (NO_2); sulfur dioxide (SO_2); lead; and particulate matter (PM), which is subdivided into two classes based on particle size: PM equal to or less than 10 micrometers in diameter (PM_{10}) and PM equal to or less than 2.5 micrometers in diameter ($PM_{2.5}$). Because the air quality standards for these air pollutants are regulated using human health and environmentally based criteria, they are commonly referred to as “criteria air pollutants.”

Ozone is the principal component of smog and is formed in the atmosphere through a series of reactions involving volatile organic compounds (VOC) and nitrogen oxides (NO_X) in the presence of sunlight. VOC and NO_X emissions are considered critical in ozone formation.

Health-based air quality standards have been established for these criteria pollutants by EPA at the national level and by the California Air Resources Board (CARB) at the State level. These standards were established to protect the public with a margin of safety from adverse health impacts due to exposure to air pollution. Specific geographic areas or air basins are classified as either “attainment” or “nonattainment” areas for each criteria pollutant based on the comparison of measured air quality data with Federal standards. The purpose of these designations is to identify the areas with air quality problems and initiate planning efforts for improvement. The SDAB is currently designated as attainment for the National Ambient Air Quality Standards

(NAAQS) of all criteria pollutants, except for ozone. The SDAB is currently designated as "marginal" nonattainment area for the 8-hour 2008 ozone standard.

EPA, under the provisions of the Clean Air Act (CAA), requires each state with regions that have not attained the NAAQS to prepare a State Implementation Plan (SIP), detailing how these standards are to be met in each local area. The SIP is a legal agreement between each State and the Federal government to commit resources to improving air quality. It serves as the template for conducting regional and project-level air quality analysis. The SIP is not a single document, but a compilation of new and previously submitted attainment plans, emissions reduction programs, district rules, State regulations, and Federal controls.

General conformity requires that all Federal actions conform to the SIP as approved or promulgated by EPA. General conformity requirements were adopted by Congress as part of the CAA Amendments and were implemented by EPA regulations in the November 30, 1993 *Federal Register* (40 CFR Sections 6, 51, and 93: "Determining Conformity of General Federal Actions to State or Federal Implementation Plans; Final Rule").

The process to evaluate General Conformity for a proposed Federal action involves an applicability analysis, conformity determination, and review. According to EPA guidance, the Federal agency must apply the applicability requirements found at 40 CFR Section 93.153(b) to the Federal action to evaluate whether, on a pollutant-by-pollutant basis, a determination of General Conformity is required. If the regulating Federal agency determines that the General Conformity regulations do not apply to the Federal action, no further analysis or documentation is required.

Analysis required by the General Conformity Rule focuses on the net increase in emissions compared to ongoing historical conditions. Existing SIPs are presumed to have accounted for routine, ongoing Federal agency activities. Conformity analyses are further limited to those direct and indirect emissions over which the Federal agency has responsibility and control. General Conformity analyses are not required to analyze emissions sources that are beyond the responsibility and control of the Federal agency. Conformity determinations are not required to address emissions that are not reasonably foreseeable or reasonably quantifiable.

A Federal action is exempt and considered to conform to the SIP if an applicability analysis shows that total direct and indirect net emissions from construction and operation of the action would be less than specified emission-rate thresholds, known as de minimis levels. The de minimis levels are based on the attainment/maintenance and nonattainment designations and classifications for the project area. If the emissions would exceed the de minimis levels, a formal air quality conformity determination is required.

NEPA air quality significance differs from the General Conformity in that all criteria pollutant emissions are considered. Therefore, the NEPA analysis also includes attainment pollutants (SO_X, PM_{10}, and $PM_{2.5}$), as well as nonattainment and maintenance pollutant emissions (VOC, NO_X, and CO) considered under General Conformity.

In California, local air pollution control districts have the primary responsibility for developing and adopting the regional elements of the SIP. In San Diego County, the San Diego Air Pollution Control District (SDAPCD) is the agency responsible for the administration of Federal and State air quality laws, regulations, and policies. Included in the SDAPCD's tasks are monitoring of air pollution, preparation of the SIP for the SDAB, and promulgation of rules and regulations. The SIP includes strategies and tactics to be used to attain the Federal ozone standard in the county. The SIP elements are taken from the Regional Air Quality Strategy, the SDAPCD plan for attaining the State ozone standard, which is more stringent than the Federal ozone standard. The rules and regulations include procedures and requirements to control the emission of pollutants and to prevent adverse impacts.

In addition to criteria pollutants, air quality regulations also focus on hazardous air pollutants (HAPs), which are also called toxic air contaminants (TACs). Federal laws use the term HAPs to refer to the same types of compounds that are referred to as TAC under State law. HAP is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. HAPs are usually present in minute quantities in ambient air; however, their high toxicity may pose a threat to public health even at low concentrations. For those HAPs that may cause cancer, in general, there is no minimum concentration that does not present some risk (i.e., there is no threshold level below which adverse health impacts may not be expected to occur). This contrasts with the criteria air pollutants, for which acceptable levels of exposure can be determined and ambient standards have been established.

EPA and ARB have ongoing programs to identify and regulate TACs. Particulate exhaust emissions from diesel-fueled engines (diesel PM) were identified as a TAC by ARB in 1998. Diesel engines tend to produce a much higher ratio of fine particulates than other types of internal combustion engines. On the Federal and State levels, diesel PM emission reduction efforts have concentrated on the use of improved fuels, adding particulate filters to engines, and requiring the production of new-technology engines that emit fewer exhaust particulates.

Sensitive air quality receptors located in proximity to the project site include live-aboard boats located within the marina approximately 900 feet to the north of the project site. There are no sensitive receptors in the vicinity of the proposed project site, with the nearest homes located east of the I-5, approximately 0.5 mile southeast of the D Street Fill.

4.3 Biological Resources

For the purpose of this analysis, biological resources are broken down into three separate categories: habitat and vegetation, wildlife and fisheries, and endangered and threatened species and other species of concern.

Habitat and Vegetation of the 12.44 acre Restoration Site

Three types of vegetation communities and one land cover type occur within the 12.44-acre portion of the D Street Fill selected as the proposed restoration site. Vegetation communities include tidally influenced southern coastal salt marsh, nontidal disturbed southern coastal salt marsh, and baccharis scrub. One land cover type, unvegetated fill, also occurs on-site. The restoration site is considered of marginal quality for sensitive plant and animal species, although these resources may occur in the immediate vicinity. In general, the vegetation communities of the restoration site are highly disturbed, with the exception of a small band of coastal salt marsh associated with the edges of the tidal channel and the square-shaped subtidal embayment. The site was formerly intertidal mudflat and salt marsh that was historically filled, resulting in its currently degraded state.

Tidally Influenced Southern Coastal Salt Marsh

Tidally influenced southern coastal salt marsh occurs on the steep banks of the square-shaped subtidal embayment and on the marsh plain adjacent to the tidal channel that defines the restoration site's southern boundary. A total of 0.23 acre of tidally influenced coastal salt marsh occurs within the boundaries of the proposed restoration site.

Holland (1986) describes southern salt marsh as a highly productive association of herbaceous and suffrutescent, salt-tolerant hydrophytes that form a moderate to dense cover and can reach a height of 3 feet. Most species are active in summer and dormant in winter (Holland 1986). Coastal salt marsh plants are distributed along distinct zones depending on such environmental factors such as frequency and length of tidal inundation, salinity levels, and nutrient status (MacDonald 1977). Tidally influenced coastal salt marsh delineated within the restoration footprint occurs at elevations ranging from approximately +5.4 feet to +7.0 feet MLLW. These elevations are representative of two overlapping coastal salt marsh elevation bands: mid-elevation salt marsh and high salt marsh. Mid-elevation salt marsh receives regular tidal inundation, and high salt marsh is inundated only during higher tides and may subsist on moisture from wicking of soils above the highest tides; however, plant species intergrade within these elevations and can be described as a continuum rather than distinct bands. The band of salt marsh habitat on-site is very narrow and occurs on steep manufactured slopes of 2:1 or less.

These steep slopes have precluded development of the full elevation range of salt marsh habitats, including low marsh dominated by California cordgrass and transition from wetland to upland habitat. The salt marsh vascular plant assemblage within the restoration site is typical of mid-littoral levels and includes Pacific pickleweed (*Sarcocornia pacifica*), coastal saltgrass, and alkali heath (Holland 1986). Other characteristic species include saltwort, shoregrass, and fleshy jaumea.

Nontidal Disturbed Southern Coastal Salt Marsh

Nontidal disturbed coastal salt marsh occurs in the area immediately adjacent to the square-shaped subtidal embayment and along the eastern boundary of the restoration site. This vegetation community occurs at elevations ranging from approximately +10 to +12 feet MLLW. Nontidal disturbed coastal salt marsh on the restoration site is dominated by saltgrass and, to a lesser extent, by alkali heath, and supports a high percentage of invasive, nonnative species such as foxtail chess (*Bromus madritensis*), sea-fig (*Carpobrotus edulis*), crystalline iceplant (*Mesembryanthemum crystallinum*), and pampas grass (*Cortaderia selloana*). In terms of function, this habitat is an upland habitat. Approximately 1.92 acres of nontidal disturbed coastal salt marsh exists on the restoration site.

Baccharis Scrub

Baccharis-dominated scrub is typified by low, soft-woody subshrubs (up to 3 feet high) that are most active in winter and early spring, and are typically on disturbed sites or those with nutrient-poor soils (Oberbauer et al. 2008). At the restoration site, this vegetation community is dominated by broom baccharis (*Baccharis sarothroides*) but also includes nonnative species found in the disturbed salt marsh areas (see above). Native species present on-site and typical of this vegetation community in the region include California buckwheat (*Eriogonum fasciculatum*) and coast goldenbush (*Isocoma menziesii*). The nonnative species blackwood acacia (*Acacia melanoxylon*), is also present. This habitat is functionally upland and does not receive tidal inundation. Approximately 5.32 acres of baccharis scrub exists on the restoration site. The Refuge presently manages this scrub via annual pruning or removal of plants at the Refuge Manager's discretion to minimize its function as habitat for potential predators of the California least tern.

Unvegetated Fill

Unvegetated fill areas have been physically modified by human activity and are no longer recognizable as a native or naturalized vegetation association. In general, these areas lack vegetation; however, vegetation, if present, is nearly exclusively composed of invasive nonnative

plant species that exploit disturbed soils. Unvegetated fill on-site includes dirt roadways and other relatively open areas that are dominated by sparse weedy vegetation such as crystalline iceplant and small amounts of broom baccharis. This land cover type does not receive tidal inundation. Approximately 4.97 acres of unvegetated fill exists on the restoration site.

Plants

Two plant species listed as California Rare Plant Rank 1B.1 and 1B.2 species (formerly known as California Native Plant Society List species) were observed on-site:

- Beach goldenaster, California Rare Plant Rank 1B.1
- Coast woolly-heads, California Rare Plant Rank 1B.2

Beach goldenaster and coast woolly-heads were observed in scrub habitat within the northeastern portion of the restoration site. Other California Rare Plant species have been documented in the immediate vicinity of the restoration site in similar habitats: Nuttall's lotus (*Lotus nuttallianus / Acmispon prostratus*) (Rank 1.B.1), estuary sea-blite (*Suaeda esteroa*) (Rank 1B.2), and Palmer's frankenia (*Frankenia palmeri*) (Rank 2.1). In addition, woolly sea-blite (*Suaeda taxifolia*) and California boxthorn (*Lycium californicum*), both Rank 4 species, were observed west of the restoration site. There is potential for these California Rare Plant species and others to occur in the restoration site area, but they have not been detected within the proposed restoration site thus far.

Eelgrass (*Zostera marina*) does not occur on-site but is known to occur in the square-shaped subtidal embayment and in the tidal channels leading to the restoration site.

The federally listed plant species, salt marsh bird's-beak (*Chloropyron maritimum maritimum*; federally listed and state listed as endangered), has been documented in tidal salt marsh habitats near the restoration site (CNDDB 2011). Habitat quality on the restoration site is considered very marginal; therefore, this species is not expected to occur within the tidal salt marsh located along the southern site margin. No federally listed plant species are expected to occur in the more "upland" portions of the restoration site (i.e., unvegetated fill, nontidal disturbed southern coastal salt marsh, or baccharis scrub).

Wildlife and Fisheries

As stated previously, the habitat quality of the restoration site is marginal and consequently does not support many wildlife species in its current state. The following species were observed on-site but are not inclusive of the variety of species likely to use the site: American coot (*Fulica*

americana), American kestrel (*Falco sparverius*), black phoebe (*Sayornis nigricans*), great blue heron (*Ardea herodias*), great egret (*Ardea alba*), northern harrier (*Circus cyaneus*), Belding's Savannah sparrow (*Passerculus sandwichensis beldingi*), and San Diego black-tailed jackrabbit (*Lepus californicus bennettii*).

Additionally, the restoration site does not contain habitat for aquatic animals, although open water is present along the square-shaped subtidal embayment at the south end of the site. The intertidal areas associated with the tidal channel and square-shaped subtidal embayment are considered Essential Fish Habitat by NMFS. Open water bordering the restoration site may periodically support pinnipeds protected by the Marine Mammal Protection Act and the federally listed endangered East Pacific green sea turtle (*Chelonia mydas*), which are known to occur in south San Diego Bay.

Endangered and Threatened Species and Other Species of Special Concern

Potentially occurring special-status and/or sensitive wildlife species within the restoration site include several bird species, one sensitive butterfly species, and one mammal species.

Several wildlife species regulated by the Service, NMFS, and CDFW under the Federal and State Endangered Species Acts occur within the larger San Diego Bay NWR area (CNDDB 2011; USFWS 2006). Many of these species are associated with open water (green sea turtle and foraging California least tern) or densely vegetated tidal salt marsh habitats (e.g., light-footed Ridgway's rail). Habitats on-site have some potential to support sensitive bird species; however, given the patchiness of the vegetation, the narrowness of the tidally influenced coastal salt marsh on the steep banks of the square-shaped subtidal embayment, and the lack of low salt marsh, salt marsh habitats on-site are considered to be of extremely low quality for light-footed Ridgway's rail.

Belding's savannah sparrow surveys resulted in the detection of multiple individuals, often vocalizing. Birds were observed carrying nest material on two occasions, and one active nest was observed in saltgrass on the east side of the square-shaped subtidal embayment. The nest was initially observed to contain at least two chicks. Approximately 3 weeks later, the nest was observed to be empty, suggesting possible successful fledging of the chicks. The presence of breeding Belding's savannah sparrow confirms that this species does use the restoration site in its present form.

Although an established and managed California least tern colony is located on the D Street Fill approximately 250 feet northwest of the restoration site (USFWS 2006), no least tern nesting has been documented within the proposed restoration site. The restoration site is not considered

suitable for California least tern nesting due to the moist, sticky nature of the soils and the extent of native and nonnative plant cover on the site (pers. comm. Brian Collins, Refuge Manager).

The restoration site is considered of marginal quality for the federally threatened coastal California gnatcatcher (*Polioptila californica californica*) as well. Scrub habitat on-site is scattered, lacking in species diversity, and ranges from 1 to 5 feet in height. There are a few documented occurrences of this species in the vicinity, but none have been observed nesting in the area (CNDDB 2011; USFWS 2006).

The D Street Fill is designated as critical habitat pursuant to the Federal Endangered Species Act for western snowy plover. Western snowy plover breeding at the D Street Fill has been sparse on the western portion of the site. Plovers have historically used the same general area of the D Street Fill as California least tern (USFWS 2006); however, there have been no recent records of breeding of this species at the D Street Fill, and western snowy plover has not been documented within the proposed mitigation area. The restoration site does not currently meet the primary constituent elements of western snowy plover critical habitat as defined by the Service (USFWS 2011), as it is lacking in (1) shoreline habitat areas for feeding that have no or very sparse vegetation that is between the annual low tide or low water flow and annual high tide or high water flow, and is subject to inundation but not constantly under water, and (2) surf- or water-deposited organic debris located on open substrates.

The wandering skipper is a locally sensitive butterfly. It is associated with coastal estuaries from Santa Barbara to the tip of Baja California, Mexico. The wandering skipper is identified as a special-status species in the CCP because it is a covered species under the Multiple Species Conservation Plan (MSCP) within the City of Chula Vista MSCP Subarea Plan (City of Chula Vista 2003). The larvae feed exclusively on coastal saltgrass that has become established in wetland habitats influenced by both fresh water and salt water. Saltgrass-dominated areas that lack this true estuarine mixture of fresh and salt water do not support the larvae.

A total of nine adult skippers were observed at seven locations in and around the restoration site. Six of the locations and eight of the total nine individuals were observed with the boundary of Marisma de Nacion, another restoration site located east of the proposed restoration site. A single adult was observed on the west bank of the square-shaped subtidal embayment, although no saltgrass was detected in that area. The survey report speculated that this individual was dispersing to a more favorable habitat, and concluded that salt marsh habitat on the steep banks of the square-shaped subtidal embayment did not constitute suitable habitat for this species.

Two species considered California Species of Special Concern by CDFW were observed on-site: northern harrier and San Diego black-tailed jackrabbit. Other sensitive species that may occur on

the D Street Fill and the restoration site include western burrowing owl (*Athene cunicularia*), a Species of Special Concern, and California horned lark (*Eremophila alpestris actia*), a former candidate for Federal listing as threatened and endangered. Suitable burrows for burrowing owl were not found during surveys conducted on-site; therefore, burrowing owls are not anticipated to colonize the restoration site. California horned lark was also not observed during field surveys.

Habitat and Species of the 29.85-acre Material Re-use Area

Material excavated from the restoration site will be used to raise the elevation of a 29.85-acre area that supports California least tern nesting. The least tern nesting site on the D Street Fill is managed jointly by the Service and the San Diego Unified Port District (Port). Management of the site by the Service is conducted in accordance with the 2006 San Diego Bay NWR CCP.

The 29.85-ac area is routinely disced to inhibit growth of vegetation that compromises the suitability of the site for tern nesting, as the California least tern usually chooses nesting locations in open areas of light-colored sand, dirt, or dried mud (USFWS 1985)Thus, the site is intentionally disturbed and may be considered disturbed upland habitat.

There are no wetland or shrubland vegetation communities analogous to those found on the restoration site. While the management goal may be to maintain a completely unvegetated nesting site, some low-growing vegetation typically becomes established during the nesting season. Typical species include salt heliotrope (*Heliotropium curassavicum*) and pineapple weed (*Matricaria discoidea*). In addition, two plant species listed as California Rare Plant Rank 1B.2 species (formerly known as California Native Plant Society List species) were observed on-site, as presented below.

Plants

Two plant species listed as California Rare Plant Rank 1B.2 species were observed on-site:

- Coast wooly-heads (*Nemacaulis denudata* var *denudata*);
- Prostrate acmispon (*Acmispon prostratus*), formerly Nuttall's lotus (*Lotus nuttallianus*).

Both species are adapted to sandy, disturbed soils that are unconsolidated and subject to movement by winds. They occur naturally in dune habitats and are found in sporadic patches throughout the 29.85-ac soil re-use area. The seed bank for both species occurs in the upper strata of the sandy nesting substrate of the least tern nesting site. This upper 6 – 8 inch strata will be stockpiled and used as cover for excavated materials placed on the 29.85-ac site. Thus, the

seed bank will be reestablished following project construction and these species are expected to reestablish naturally.

Wildlife and Fisheries

There are no wetland or open water habitats associated with the 29.85-ac soil re-use site. Wildlife species observed on-site are similar to those observed in or near the 12.4-ac restoration site and include American kestrel, black phoebe, and San Diego black-tailed jackrabbit.

Endangered and Threatened Species and Other Species of Special Concern

As previously stated, the 29.85-ac material re-use site includes the majority of an established California least tern colony managed jointly by the Service and the Port. The federally and State listed endangered California least term began nesting at this site in 1973. However, continuous annual nesting did not begin until 1994, when the potential for significant human disturbance was eliminated. California least terns are generally present at this nesting site between mid- April and late August (Patton 2013), but can be present into September. In 2012, at least 114 nests were initiated by 78 to 93 estimated pairs between 5 May and 10 July, and at least 65 chicks from 47 nests hatched successfully. However, it is estimated that only nine young fledged from the site (Patton 2013). In 2013, at least 144 nests were initiated by 113 to 128 estimated pairs, with an estimated 23 to 32 young fledged from the site (Frost 2014).

As stated previously, the sandy surface of the nesting site is subject to invasive weed treatment and vegetation management to maintain an open expanse suitable for least tern nesting. In addition, the entire D Street Fill is subject to predator management per the Predator Management Plan appended to the San Diego Bay NWR CCP. As necessary, measures are taken to eliminate predator habitat and discourage and remove predators to enhance the nesting success of the California least tern colony.

The D Street Fill is designated as critical habitat pursuant to the Federal Endangered Species Act for western snowy plover. Western snowy plovers have historically used the same general area of the D Street Fill for nesting as the California least tern (USFWS 2006); however, the last documented nesting attempt by snowy plovers at D Street Fill was in 2000 (Patton 2013).

Two species considered California Species of Special Concern by CDFW were observed on the 29.85-ac material re-use site: northern harrier and San Diego black-tailed jackrabbit. Other sensitive species that may occur on the D Street Fill and the restoration site include western burrowing owl a Species of Special Concern, and California horned lark a former candidate for Federal listing as threatened and endangered.

4.4 Cultural Resources

The setting and context for cultural resources can be found in the EIS for the San Diego Bay NWR CCP, which is incorporated by reference into the current document. The full text of the Final CCP/EIS is available online.[1]

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 (P.L. 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 National Register of Historic Places (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. A historical property must 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.

For the prehistoric and historic setting and context for the D Street Fill, please see the Final CCP/EIS for the San Diego Bay NWR CCP, which is incorporated by reference into the current document.[1]

Archival Research

As part of the Section 106 identification effort, a records search was conducted by AECOM at the South Coastal Information Center located at San Diego State University. The archival search consisted of an archaeological and historical records and literature review. The data reviewed included historic maps, the California Inventory of Historic Places, and California Register of Historical Resources and NRHP information for the project area. The search included a 1-mile radius around the proposed D Street Fill. This research provides a background on the types of sites that would be expected in the region. The research was also used to determine whether previous surveys had been conducted in the area and what resources had been previously recorded within the proposed D Street Fill.

The results of the records search indicated that 29 previous investigations have been conducted within a 1-mile radius of the proposed D Street Fill, including at least two that covered either a portion of the area of potential effects (APE) or its entirety. Additionally, a comprehensive

management plan and EIS has been prepared by the Service (2006) and monitoring has been recently conducted in the area (Bowden-Renna 2010).

Ten cultural resources have been previously recorded within a 1-mile radius of the proposed D Street Fill. These consist of two destroyed prehistoric shell middens, a prehistoric temporary campsite, a prehistoric lithic and shell scatter, a prehistoric lithic scatter, an undetermined prehistoric site known as "Carter's Site," two railroad segments, a 1930s trash deposit, and the remnants of the Hercules Powder Company. Of these resources, five are located within the Sweetwater Marsh Unit identified by the Service. Additionally, one historic address is located within a 1-mile radius of the project area consisting of the California Southern/Santa Fe Depot, which has been designated as California Historic Landmark Number 1023. No previously recorded cultural resources have been identified within the proposed D Street Fill APE.

Tribal consultation initially occurred in 2005 during the CCP process by the Refuge staff, and as the project developed on January 17, 2013. No issues or comments were raised during these efforts. As the project further developed, the Service completed a Sacred Lands search with the Native American Heritage Commission (NAHC), who in turn provided an updated list of tribes and tribal contacts on December 31, 2014. The Service provided updates of the project to the tribes and tribal contacts provided by the NAHC in the consultation letters dated January 7, 2015. Julie Hagen of the Viejas Band of Kumeyaay Indians responded on January 29, 2015, requesting a copy of the cultural resource report and an on-site visit of the project area. Brian Collins, Refuge Manager, responded on January 30, 2015 (via email and hardcopy), to coordinate a date and time for a site visit and provided a copy of AECOM's cultural resources monitoring report. Mr. Collins contacted Ms. Hagen again on February 27, 2015, at which time a field visit was scheduled for March 5, 2015. In an email message on March 5, 2015, however, Ms. Hagen cancelled the site visit. A comment letter, dated August 27, 2015, was received from the Viejas Tribal Government in response to the draft EA. The letter requested we specify that a Kumeyaay monitor be onsite during the restoration work. That requirement has been incorporated into the scope of the project.

For the current proposed project, SDG&E commissioned cultural resource investigations in 2011 and 2013 with AECOM archaeologists that included a field survey and monitoring of the coring activities associated with soil sampling at the site. As a result, no cultural resources were identified.

4.5 Contaminants

Contaminants are substances (human-made or naturally occurring) that enter the air, water, and land in a variety of ways and originate from many different sources. Surface water enters the

Refuge from adjacent lands via the Sweetwater River and several small drainage channels. Urban runoff and storm water from upstream urban areas flow into the Sweetwater River, Paradise Creek, and other tributaries that flow into the Sweetwater River. Some common pollutants that can be carried in these waters include fertilizers, pesticides, oil and grease, detergents, coolant, and paint. Groundwater transport can transport contaminants from adjacent developed or cultivated areas into natural drainages and wetlands. In addition, wind can transport airborne contaminants such as fine particulate matter into wetland areas.

Contaminants may include pesticides, such as dichlorodiphenyltrichloroethane (DDT) and chlordane; industrial chemicals and by-products, such as polycyclic aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs) and other dioxins; and toxic elements, such as mercury and lead. These substances can be individually toxic, or they may trigger negative effects to ecosystems by alteration of normal biochemical processes. Contaminants may also interact with various other biological or physical processes that can result in detrimental effects to a variety of receptor organisms.

As the primary Federal agency dedicated to protecting wildlife and their habitats, the Service conducts contaminant studies on important wildlife species, such as migratory birds, anadromous fish, and threatened and endangered species. These and other studies confirm that many environmental contaminants can alter reproductive system function in adult animals and affect early life stages of fish, mammals, and birds. The Service's contaminants specialists, in cooperation with the U.S. Geological Survey Biological Resources Division's Biomonitoring of Environmental Status and Trends (BEST) Program, have also developed tools such as the Contaminants Assessment Process (CAP) to assist in evaluating contaminant threats to National Wildlife Refuges, as well as other Service lands.

The CAP provides a standardized approach for documenting and assessing contaminant threats to lands and biota, and involves two primary components: (1) a retrospective analysis of known and suspected contaminant sources and contaminated areas, and the investigation of existing or potential contaminant transport pathways; and (2) a determination of Refuge areas that are vulnerable to spills and/or contamination. These data can then be used to increase awareness and understanding of contaminant issues and how they might affect trust resources. The CAP assists Refuge staff in prioritizing necessary sampling and/or cleanup actions, developing proposals for future investigations, and initiating pollution prevention activities. CAPs were completed for the Sweetwater Marsh and South San Diego Bay Units (Figure 1).

The proposed project is located within the Sweetwater Marsh Unit, which adjoins the highly urbanized cities of National City and Chula Vista and is situated at the end of the watershed. Urban runoff and storm water from industrial, commercial, and residential areas carry pollutants,

such as coliform bacteria, trace metals (particularly copper and zinc), and other toxics directly into Paradise Marsh and Sweetwater Marsh. In the past, the lands within and adjacent to this area were utilized for industrial, agricultural, and landfill purposes. These past and present uses represent potential sources of contaminants that could adversely affect Refuge resources. Detailed information regarding contaminant sources within the Sweetwater Marsh Unit can be found in the San Diego Bay NWR CCP (USFWS 2006).

In 2012, a nonintrusive historical study, (Bodhi Group 2012) was completed to evaluate the presence of hazardous materials at the proposed project location. The study concluded that there was no evidence of hazardous materials, hazardous waste, or other environmental constraints that would preclude restoration to the D Street Fill (Bodhi Group 2013). A site-specific subsurface investigation was recommended to confirm the absence of hazardous materials and to evaluate if material excavated for the D Street Fill restoration project can be used beneficially on-site or off-site. The Bodhi Group prepared a Sampling and Analysis Plan (SAP), identifying six sample locations (DSTSB002 through DSTSB007) that were randomly selected and one location (DSTSB001) where scattered broken glass was observed during a 2012 site reconnaissance.

The results of the SAP are documented in the *Report of Soil Sampling and Analysis, D Street Fill Habitat Restoration Project, Chula Vista, California* (Bodhi Group 2013). This report concluded that there are no hazardous materials on-site, based on multiple lines of evidence of no observations of contamination in the soil cores, no history of unauthorized chemical releases on-site, and chemical concentrations either below screening levels or representative of background conditions. Further, the soil at the site would not require special handling or additional health and safety measures for chemical exposures other than those normally exercised for construction projects in areas that do not have environmental contamination. Comparison of chemical concentrations with the toxicity criteria for identification of hazardous waste published in Section 66261 in Title 22 of the California Code of Regulations and Section 261 in Title 40 of the CFR indicate that soil excavated from the site will not be classified as hazardous waste (Bodhi Group 2013).

4.6 Greenhouse Gas Emissions

Certain gases in the earth's atmosphere, classified as GHGs, play a critical role in determining the earth's surface temperature. A portion of the solar radiation that enters the earth's atmosphere is absorbed by the earth's surface, and a smaller portion of this radiation is reflected back toward space. This infrared radiation (i.e., thermal heat) is absorbed by GHGs within the earth's atmosphere. As a result, infrared radiation released from the earth that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This

phenomenon, known as the "greenhouse effect," is responsible for maintaining a habitable climate on the earth.

GHG emissions related to human activities have been determined as "extremely likely" to be responsible (indicating 95% certainty) for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth's atmosphere and oceans, with corresponding effects on global circulation patterns and climate (ARB 2014a). The quantity of GHGs that it takes to ultimately result in climate change is not precisely known; however, no single project is expected to measurably contribute to a noticeable incremental change in the global average temperature, or to a global, local, or micro climate.

GHGs are present in the atmosphere naturally, are released by natural and anthropogenic sources, and are formed from secondary reactions taking place in the atmosphere. Natural sources of GHGs include the respiration of humans, animals, and plants; decomposition of organic matter; and evaporation from the oceans. Anthropogenic sources include the combustion of fossil fuels, waste treatment, and agricultural processes. The following are GHGs that are widely accepted as the principal contributors to human-induced global climate change:

- Carbon dioxide (CO_2)
- Methane (CH_4)
- Nitrous oxide (N_2O)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulfur hexafluoride (SF_6)
- Nitrogen trifluoride (NF_3)

The majority of CO_2 emissions are by-products of fossil fuel combustion. CH_4 is the main component of natural gas and is associated with agricultural practices and landfills. N_2O is a colorless GHG that results from industrial processes, vehicle emissions, and agricultural practices. HFCs are synthetic chemicals used as a substitute for chlorofluorocarbons in automobile air conditioners and refrigerants. PFCs are produced as a by-product of various industrial processes associated with aluminum production and the manufacturing of semiconductors. SF_6 is an inorganic, odorless, colorless, nontoxic, nonflammable GHG used for insulation in electric power transmission and distribution equipment, and in semiconductor manufacturing. NF_3 is used in the electronics industry during the manufacturing of consumer items, including photovoltaic solar panels and liquid-crystal-display (i.e., LCD) television screens.

Combustion of fossil fuel in the transportation category was the single largest source of California's GHG emissions in 2012, accounting for 36% of total GHG emissions in the state. The transportation category was followed by the electric power category (including in-state and out-of-state sources), which accounts for 21% of total GHG emissions in California, and the industrial category, which accounts for 19% of the state's total GHG emissions (ARB 2014b).

The Intergovernmental Panel on Climate Change (IPCC) concluded that variations in natural phenomena, such as solar radiation and volcanoes, produced most of the warming of the earth from pre-industrial times to 1950. These variations in natural phenomena also had a small cooling effect. From 1950 to the present, increasing GHG concentrations resulting from human activity, such as fossil fuel burning and deforestation, have been responsible for most of the observed temperature increase. Global surface temperature has increased by approximately 1.53 degrees Fahrenheit over the last 140 years (IPCC 2013); however, the rate of increase in global average surface temperature has not been consistent. The last three decades have warmed at a much faster rate per decade (IPCC 2013).

To address GHG emissions at the Federal level, President Obama on October 5, 2009, signed Executive Order 13514, which addresses the need to set measureable environmental performance goals for Federal agencies. On January 29, 2010, President Obama announced that the Federal government would reduce its GHG emissions by 28% by 2020. To achieve this goal, each Federal agency must develop a sustainability plan that defines how sustainability goals would be met, energy use would be reduced, long-term savings would be achieved, taxpayer dollars would be saved, and local clean energy jobs would be created.

On March 19, 2015, the President signed Executive Order 13693, Planning for Federal Sustainability in the Next Decade. Executive Order 13693 sets a goal of reducing Federal agency GHG emissions by 40% over the next decade. The Executive Order sets agency GHG reduction targets and sustainability goals, and requires the head of each Federal agency to propose percentage reduction targets for agency-wide GHG reductions by the end of fiscal year 2025 relative to a fiscal year 2008 baseline.

On December 18, 2014, CEQ released revised draft guidance that supersedes the draft GHG and climate change guidance released by CEQ in February 2010. The revised draft guidance applies to all proposed Federal agency actions, including land and resource management actions. This guidance explains that agencies should consider both the potential effects of a proposed action on climate change, as indicated by its estimated GHG emissions, and the implications of climate change for the environmental effects of a proposed action (CEQ 2014). The guidance encourages agencies to draw from their experience and expertise to determine the appropriate level (broad, programmatic, or project- or site-specific) and type (quantitative or qualitative) of analysis

required to comply with NEPA. The guidance recommends that agencies consider 25,000 metric tons of carbon dioxide equivalent (MT CO_2e) on an annual basis as a reference point below which a quantitative analysis of GHG emissions is not recommended unless it is easily accomplished based on available tools and data (CEQ 2014).

In California, the Governor signed Executive Order S-3-05 in June 2005, which proclaimed that California is vulnerable to the impacts of climate change. Executive Order S-3-05 declared that increased temperatures could reduce the Sierra Nevada's snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the Executive Order established total GHG emissions targets. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80% below the 1990 level by 2050.

In 2006, California passed the California Global Warming Solutions Act of 2006 (AB 32; California Health and Safety Code Division 25.5, Sections 38500, et seq.). AB 32 further details and puts into law the mid-term GHG reduction target established in Executive Order S-3-05: reduce GHG emissions to 1990 levels by 2020. AB 32 also identifies ARB as the State agency responsible for the design and implementation of emissions limits, regulations, and other measures to meet the target.

In December 2008, ARB adopted its Climate Change Scoping Plan (Scoping Plan), which contains the main strategies California would implement to achieve the required GHG reductions required by AB 32 (ARB 2008). ARB is required to update the Scoping Plan at least once every 5 years to evaluate progress and develop future inventories that may guide this process. ARB approved the first update to the Climate Change Scoping Plan: Building on the Framework in June 2014 (ARB 2014a). The Scoping Plan update includes a status of the 2008 Scoping Plan measures and other Federal, State, and local efforts to reduce GHG emissions in California, and potential actions to further reduce GHG emissions by 202

4.7 Sea Level Rise

A major area of concern related to global climate change in San Diego County is sea level rise. Sea level rise could have widespread adverse consequences for California's coastal resources, including increased inundation, flooding, and coastal erosion. Sea level rise would not be uniform, nor uniformly affect the state's population, infrastructure, and ecosystems. Rising sea level inundates low-lying wetlands and dry land, erodes shorelines, contributes to coastal flooding, and increases the flow of salt water into estuaries and nearby groundwater aquifers. Higher sea level also makes coastal infrastructure more vulnerable to damage from storms.

Sea level rise may result from a combination of (1) the volumetric expansion of existing seawater as water temperatures rise significantly, and (2) the increase in total sea water as large ice deposits on land (e.g., large glaciers) melt into the sea. Local sea level rise may be affected by both global sea level rise and land mass movements and subsidence. In the past century, global mean sea level (MSL) has increased by 7 to 8 inches (IPCC 2013). Consistent with the global increase over that same time period, the MSL along the California coast has risen 8 inches (CCC 2013).

The National Research Council's (NRC) most recent climate science report, *Sea Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future*, has estimated that sea levels along the U.S. Pacific Coast would increase up to 66 inches by 2100 (NRC 2012). The report contains sea level rise projections for California for three time periods over the coming century for north and south of Cape Mendocino. The regional projections for the area south of Cape Mendocino indicate an increase in sea level of between 1.56 and 11.76 inches by 2030 and an increase of between 4.68 and 24 inches by 2050 (NRC 2012).

California estimates of sea level rise are also consistent with the NRC report. The 2009 *California Climate Adaptation Strategy* estimates that sea level rise would increase in California between 12 and 17 inches by 2050 and between 20 and 55 inches by 2099 (CNRA 2009). The California Department of Water Resources supports a range in sea level rise of 7 to 55 inches along California's coast by 2100 (DWR 2008).

NOAA has developed maps that indicate areas around San Diego that would be affected by various ranges of sea level rise. Exhibit 4.7-1 shows the current Mean Higher High Water (MHHW), which is the average of the higher high water height of each tidal day.

Exhibit 4.7-2 shows the project area with a 2-foot (24-inch) sea level rise that could occur by 2050. Exhibit 4.7-3 shows the project area with a 5-foot (60-inch) sea level rise that could occur by 2100. The shades of blue (darker blue = greater depth) represent areas that are hydrologically connected and would be inundated at high tide.

Coastal habitat areas likely to be affected by sea level rise include beaches, wetlands, estuaries, lagoons and tidal marshes, tidal flats, and tidally influenced streams and rivers. Tidal wetlands are among the first habitats to be impacted by sea level rise. As the intertidal zone shifts inland, sea level rise could lead to wetland habitat conversion and loss. California has lost 90% of its coastal wetlands, and erosion and flooding currently pose risks to many of the remaining coastal ecosystems (CCC 2013).

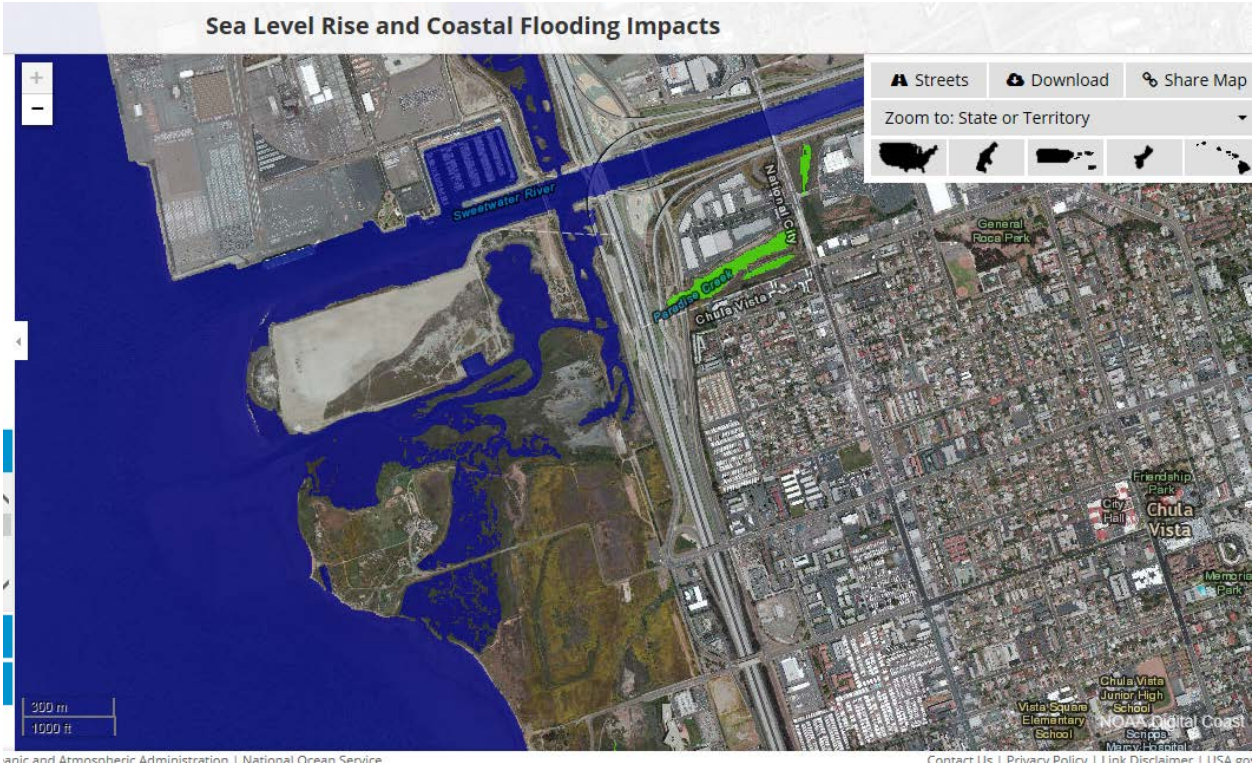

Exhibit 4.7-1. Current Mean Higher High Water. Source: NOAA 2015.

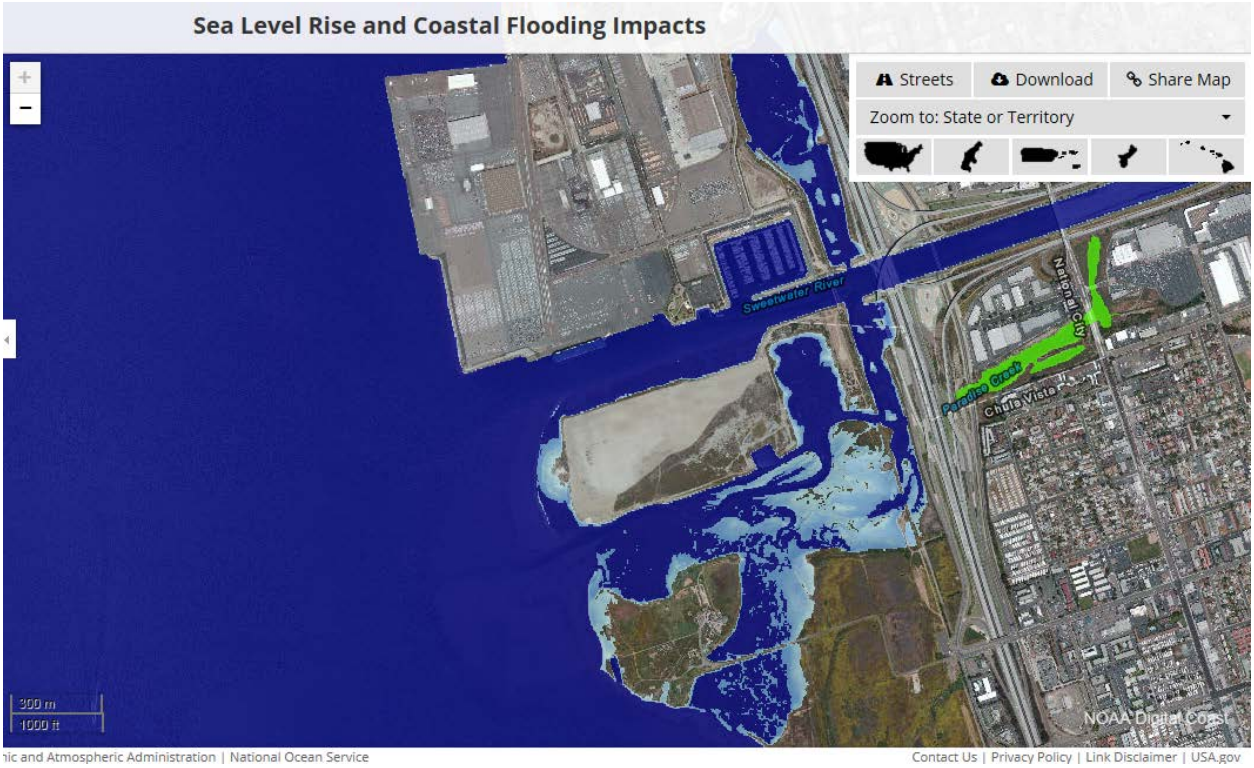

Exhibit 4.7-2. Project area with 2-foot sea level rise by 2050. Source: NOAA 2015.

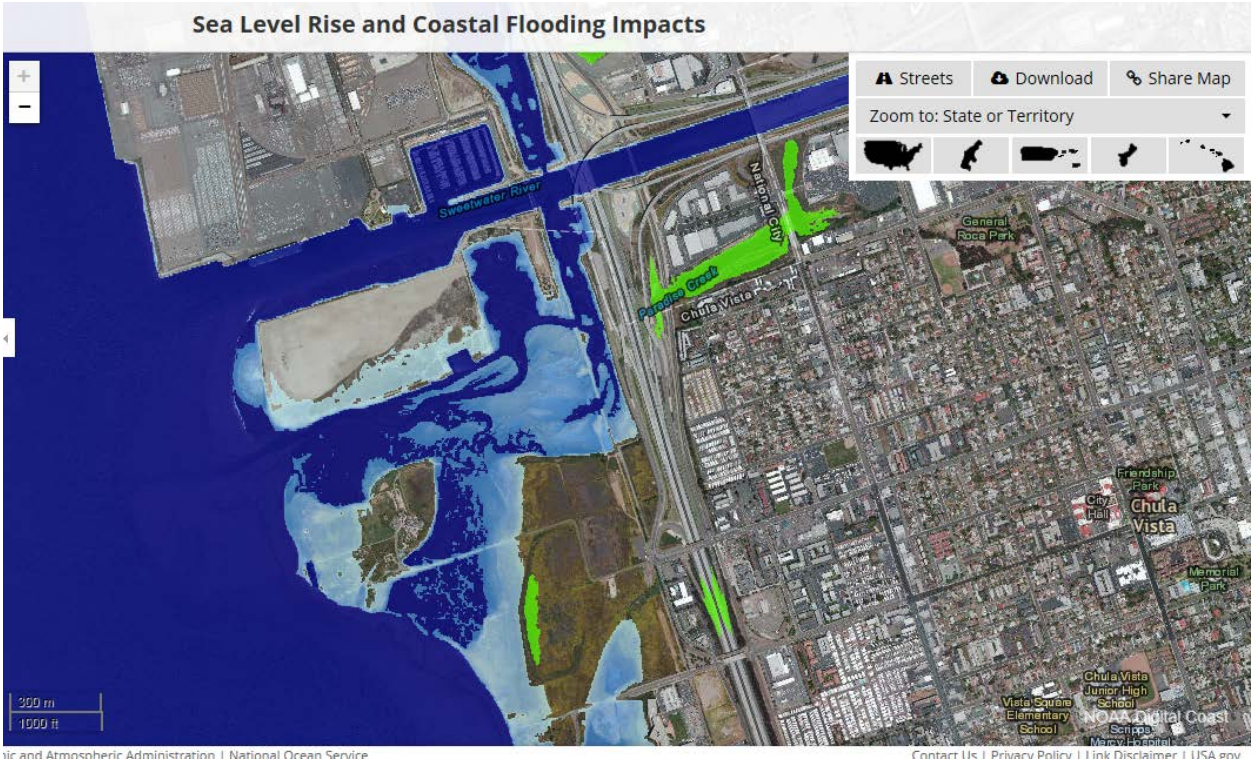

Exhibit 4.7-3. Project area with 5-foot sea level rise by 2100. Source: NOAA 2015.

Executive Order S-13-08 was issued by Governor Edmund G. Brown Jr. on November 14, 2008, to enhance California's management of potential climate effects from sea level rise, increased temperatures, shifting precipitation, and extreme weather events. The California Natural Resources Agency (CNRA) was directed to coordinate with local, regional, State, and Federal public and private entities to develop the *California Climate Adaptation Strategy*, which summarizes the best known science on climate change impacts to California, assesses California's vulnerability to the identified impacts, and then outlines solutions that can be implemented within and across State agencies to promote resiliency.

California agencies have developed guidance documents to address sea level rise for projects located in areas that would be subject to sea level rise. In October 2013, the CCC prepared *Draft Sea-Level Rise Policy Guidance* to provide a framework for addressing sea level rise in local coastal programs and Coastal Development Permits (CCC 2013). The guidance is based on groups of principles for addressing sea level rise in the California coastal zone, including (A) use science to guide decisions; (B) minimize coastal hazards through planning and development standards; (C) maximize protection of public access, recreation, and sensitive coastal resources; and (D) maximize agency coordination and public participation.

The CCC also indicates that projects should acknowledge and address sea level rise as necessary in planning and permitting decisions. Adaptation measures can be implemented as project design features to minimize risks from sea level rise and protect coastal resources. The California Coastal Commission provides a list of potential adaptation measures that are organized into categories, such as shoreline management.

4.8 Environmental Justice

Environmental justice is defined by EPA as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies." The goal of environmental justice in the United States is to afford the same degree of protection from environmental and health hazards to all individuals and communities throughout the nation. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, State, local, and tribal programs and policies. To achieve meaningful involvement requires that all potentially affected individuals have an appropriate opportunity to participate in decisions about proposed activities that could affect their environment and/or health and that the concerns of all participants are considered in the decision-making process.

Executive Order 12898 "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations" (February 11, 1994), requires that Federal agencies consider as part of their action, any disproportionately high and adverse human health or environmental effects to minority and low income populations. Agencies are required to ensure that these potential effects are identified and addressed. In this context, fair treatment means that no group of people should bear a disproportionate share of negative environmental consequences resulting from the action.

This Environmental Justice section presents descriptive information about communities in and around San Diego Bay and the proposed project site, and their racial/economic composition. Minorities are defined as individuals who are members of one of the following population groups: Hispanic, African-American, American Indian or Alaskan Native, and Asian or Pacific Islander. Low-income populations are those exceeding the poverty threshold; or, as defined by the U.S. Department of Housing and Urban Development, low income is considered 80% of the median family income for a specific area, subject to adjustment for areas with unusually high or low incomes or housing costs.

Data used to assess environmental justice considerations were obtained from the U.S. Census Bureau, Census 2010, which is the most complete and accurate source of demographic data and economic/income data available for the project area. Data related to the census tract block groups that encompass the project study area were used to compile information that could be used to distinguish minority and low-income populations.

The information provided in Table 7 shows the minority and low-income composition of communities located closest to the project site in the southern portion of San Diego Bay, and a comparison of those communities to the entire San Diego region and the State of California. As shown in the table, the percentage of minorities in some of the communities surrounding the project site is higher than San Diego County as a whole.

Table 7
Racial Composition and Poverty Level Status (2010)

Jurisdiction	Total Population	Population below Poverty Level	Below Poverty Level (%)	Minority* (%)	Median Income**
California	37,253,956	5,886,125	15.8%	37.6	$60,883
San Diego County	3,224,432	477,216	14.8%	28.4	$62,771
Imperial Beach (city)	28,680	6,080	21.2%	26.8	$52,148
Coronado (city)	23,916	1,459	6.1%	10.7	$85,985
National City (city)	57,799	12,485	21.6%	33.9	$38,849
Chula Vista (city)	237,595	19,958	8.4%	34.5	$66,955
San Diego (city)	1,376,173	239,454	17.4%	35.8	$61,118

* Minority aggregation includes the sum of Black, Asian, American Indian and Alaskan Native, Hawaiian and other Pacific Islander, some other race, and two or more races.
** Median household income in 2010 dollars, not adjusted for inflation.
Source: SANDAG 2012; U.S. Census Bureau 2010.

The project site is located in the City of Chula Vista, which has a lower percentage (8.4%) of the population below the poverty level than that for the State of California (15.8%), San Diego County (14.8%), or the adjacent cities (except Coronado (6.1%)). The municipalities that are composed of a greater percentage of racial minorities when compared to San Diego County as a whole include the City of Chula Vista, City of San Diego, and National City. However, all of these cities contain a lower proportion of racial minorities than that for the State of California as a whole. National City, the City of Imperial Beach, and the City of San Diego have the highest percentage of people living below the poverty level at 21.6%, 21.2%, and 17.4%, respectively. These three cities also have a median household income below that of San Diego County as a whole at $38,849 for National City, $52,148 for Imperial Beach and $61,118 for the City of San Diego.

There are no sensitive receptors in the vicinity of the proposed project site, with the nearest homes located east of the I-5, approximately 0.5 mile southeast of the D Street Fill, in the City of Chula Vista.

4.9 Geology and Soils

The D Street Fill was created in 1969 as part of a dredging project in which dredge spoils from the construction of the Sweetwater Channel and the National City Marina were deposited within an existing wetland on habitat similar to that found in Sweetwater Marsh. Soils throughout the restoration site consist of dredged fill material and native sediments. Dredged fill material, ranging from 4 to 8 feet below ground surface (bgs), is composed of fine sand with trace silts and invertebrate shells. Native sediments consist of fine to medium sand with trace silt to fine sandy clay.

Geologically, the project site is located within the Peninsular Ranges Geomorphic Province of California. This province, which stretches from the Los Angeles basin to the tip of Baja California, is characterized as a series of northwest-trending mountain ranges separated by sub-parallel fault zones, and a coastal plain of subdued land forms. The mountain ranges are underlain primarily by Mesozoic metamorphic rocks that were intruded by plutonic rocks of the Southern California batholith, while the coastal plain is underlain by subsequently deposited marine and non-marine sedimentary formations.

To further characterize the soils on-site, *Report of Soil Sampling and Analysis, D Street Fill Habitat Restoration Project, Chula Vista, California* was prepared and implemented for the 12.44-acre restoration site (Bodhi Group 2013). The SAP identifies six sample locations that were randomly selected (DSTSB002 through DSTSB007) and one non-random location where scattered broken glass was observed (DSTSB001) during a 2012 site reconnaissance. Soil cores were collected to a depth of 16 feet below ground surface at 2-foot intervals for each core in an attempt to identify sand layers that might be suitable for beneficial use such as beach nourishment. The SAP conclusions are summarized below.

The project is situated at the western edge of the coastal plain at the mouth of the Sweetwater River. The river empties into San Diego Bay through a series of meandering channels in an estuarine environment, natural and manmade. The project is located adjacent to an estuary that has been filled with sediments dredged and excavated to create channels and is underlain by fill and estuarine sediments (Quaternary Bay Mud). The sediments are underlain at depth by late Pleistocene Old Paralic deposits (previously known as the Bay Point Formation). The Old Paralic deposits were not encountered in the subsurface investigation.

Fill

The fill is composed of pale grayish brown to light brownish gray, loose clayey and silty to clean poorly graded fine sand (SC, SM to SP). Poorly developed soil horizons have formed locally on the fill. Based on observation of the continuous soil cores, the fill ranges from 4 to 8 feet thick. The fill within 1 to 2 feet of the contact with the underlying Bay Mud was observed to be saturated. In some borings, the contact between the fill and Bay Mud was marked by a thin vegetation layer where the fill was placed over natural vegetation (Bodhi Group 2013).

Quaternary Bay Mud

The Bay Mud is composed of interbedded gray, lean clay (CL), silty and clayey fine sand (SM and SC), and poorly graded fine to medium grained sand (SP). The sediments are generally soft to medium dense and the sandier sediments are saturated. Observations of soil cores and outcrop indicate a 1- to 2-foot-thick clay layer just below the fill. The Bay Mud is also distinguished by its darker color than the overlying fill (Bodhi Group 2013).

Site Soil Physical Properties

Soil samples representative of soil that would be excavated (samples were collected from the surface to 8 feet bgs) and sediments that would remain (samples were collected from 14 and 15 feet bgs) were analyzed for grain size. Two fill samples (representative of soil to be excavated) were classified as silty sand, with 62% and 75% in the sand fraction (coarser than #200) and 38% and 25%, respectively, in the silt and clay fraction (finer than #200). A sample from the Bay Mud (formational soil) also representative of soil to be excavated was classified as silty sand with 51% sand and 49% in the silt and clay fraction. Two samples of Bay Mud representative of sediments that would remain were classified as a lean clay with a sand fraction of 33% and 4%, respectively.

Four samples in the fill and Bay Mud (two samples each) representative of soil to be excavated were analyzed for unit weight and moisture content. The dry unit weight ranged from 82 to 90 pounds per cubic foot.

4.10 Hydrology

The majority of the restoration site is located within the western portion of the approximately 79,818-square-mile Lower Sweetwater River Watershed. It is specifically located just south of the Sweetwater River flood control channel where it enters San Diego Bay, and north of a tidal channel, which is a tributary to Sweetwater River and Sweetwater Marsh. The Sweetwater River

Watershed encompasses over 148,000 acres and includes one Hydrologic Unit and three Hydrologic Areas: Lower Sweetwater, Middle Sweetwater, and Upper Sweetwater (County of San Diego 2011). Major water bodies include the Sweetwater River, Sweetwater Reservoir, Loveland Reservoir, and San Diego Bay. Rainfall in the watershed widely varies from 10.5 inches near the coast to approximately 35 inches in the far inland areas (County of San Diego 2011). The northern portion of the restoration site, which contains the upland scrub habitat, is located within the San Diego Bay Watershed. The majority of the restoration site is located in the 100-year (Zone AE) floodplain, with the northwest edge of the site occurring within the 500-year Federal Emergency Management Agency floodplain.

The hydrological conditions within the San Diego Bay NWR are influenced by tidal processes and surface water runoff. Freshwater contribution to the bay comes primarily from the Otay and Sweetwater Rivers and secondarily from several creeks, as well as some minor drainage groups. Tidal inundation is essential to the coastal wetland habitats supported on this Refuge. The ebb and flow of tides within the bay circulate and mix ocean and bay waters and produce currents that influence salinity levels and temperatures throughout the bay (U.S. Navy 2013). The water levels in the bay vary with the astronomical tides, with water levels highest during high tide. In the Southern California Bight, the tides are of the mixed, semi-diurnal type, with two highs and two lows of unequal height occurring each lunar day (an average duration of 24.4 hours).

Freshwater input is limited to surface runoff from urban areas (e.g., the over 200 storm drains and intermittent flows from several rivers and creeks after storms). For about 9 months of the year, the bay receives no significant amount of fresh water. Evaporation approximately balances the freshwater input from all sources over the course of the entire year (Lackey and Clendenning 1965).

Circulation of ocean currents outside the bay affects organisms having access and entry to the bay. The ebb and flood of tides within the bay circulate and mix ocean and bay waters, and also transport organisms, especially plankton, in and out of the entrance. Tides produce currents, induce changes in salinity, and alternately expose wet portions of the shoreline. Tidal flushing and mixing are important for dispersing pollutants, maintaining water quality for marine life, and moderating water temperature that has been affected by exchange with the atmosphere.

Bay circulation may be driven by wind, tides, temperature, and density gradients associated with seasonal, tidal, and diurnal cycles. In San Diego Bay, circulation is primarily related to tides, because winds are of mild magnitude and there is a low fetch area (Wang et al. 1998). Tidal patterns off this coast are mixed, with two unequal highs and lows each day. The diurnal difference in MHHW and low MLLW tides is 5.6 feet (1.7 meters), with extremes of 9.8 feet (3 meters) (Largier 1995).

The tidal conditions in San Diego Bay are measured using a long-term harmonic tide gage station operated by NOAA at the Navy Pier near downtown San Diego. Tidal measures collected over a previous tidal epoch (19-year period from 1960–1978) have been statistically reduced to obtain long-term average values of MLLW, Mean Lower Water, Mean Tidal Level, Mean Higher Water, and MHHW. The highest observed water level in the bay, 8.35 feet MLLW, was recorded on January 27, 1983, and the lowest observed water level, -2.88 feet MLLW, was recorded on December 17, 1973 (NOAA 2003).

Due to the height of the fill, the majority of the site is above the elevation of tidal inundation. Elevations at the proposed restoration site currently range from -0.72 feet MLLW in the subtidal basin at the southern edge of the site, up to 13.9 feet MLLW at the northeastern edge of the site, based on 2013 topographic data obtained for the project. Based on the latest tidal data acquired for San Diego Bay (Control Tide Station: 9410170 San Diego Bay, the mean tide level was 2.96 feet above MLLW (NOAA 2011). Aside from the slopes of the tidal basin and fill bordering the natural marsh plain, the site is relatively flat, sloping gently from the northeast to the southwest. Based on field data and observations during a +7.1 feet MLLW tide event, it is unlikely that disturbed nontidal salt marsh habitat on the restoration site receives hydrology from high groundwater during higher tide events.

Flushing rates change drastically as one moves away from the bay entrance. Longest residence times are observed in the summer, apparently related to the density stratification of the bay at that time (Chadwick 1997). The amplitude of the tidal cycle also affects the flushing rate. During a strong tidal cycle, up to 40% of the mean volume of the bay passes Ballast Point during the ebb flow, at least temporarily residing outside the bay. During an average tidal cycle, the volume of water leaving the bay is about 13%. This bay water mixes with ocean water. During the next flood tide, this mix gets pulled back into the bay. While the residence time of water near the northern inlet of the bay is short except for side basins where commercial and marina activities are located (Largier 1995), it can take from 10 to 100 days for water in the bay as a whole to be exchanged, depending on the tidal amplitude. Residence times in the south bay may be months, ranging from 20 to 300 days (Chadwick 1997).

4.11 Water Quality

Between the early 1800s and the mid to late 1900s, water quality in San Diego Bay suffered serious degradation due to the discharge of untreated municipal sewage and a variety of toxic and nontoxic industrial wastes (AECOM 2014). In 1960, much of the bay was declared polluted due to high bacteria levels. As a result, all water contact activities were prohibited. It was not until 1964 that domestic sewage discharges into the bay, including those from San Diego, Chula Vista, Coronado, and the Naval Amphibious Base, finally ceased and the discharge was instead

routed to an ocean outfall. By the early 1970s, major industrial process discharges had also been diverted to the Metropolitan Sewage System and, by 1980, all sewage and industrial waste discharges into the bay, including those from naval operations, ceased (U.S. Navy 2013).

Until the 1970s, pollution issues in the bay focused on bacterial contamination from discharged sewage, but as bacterial levels were reduced, the focus on the bay's water quality shifted to contaminants related to the discharge of industrial wastes. Various water quality studies in the bay identified high levels of copper, tributyltin, PCBs, and PAHs in bay sediments (USFWS 2006).

In 1998, San Diego Bay was included on California's Section 303(d) list as an impaired water body by the SWRCB due to benthic community degradation and toxicity. Section 303(d) of the Federal CWA (33 USC 1250, et seq., at 1313(d)) requires States to identify "water quality limited segments" and then rank each segment, taking into account the severity of the pollution and the uses to be made of the waters. The California 303(d) Listing Policy sets the rules to identify which waters do not meet water quality standards. The Policy distinguishes between the categories of waters that do not meet water quality standards. These categories basically describe the Total Maximum Daily Loads (TMDL) requirement status for each water body pollutant combination. The categories are (1) waters still requiring a TMDL, and (2) waters where the water quality limited segment is being addressed. Water segments in the "Water Quality Limited Segments Being Addressed" category must meet either of the following conditions:

1. A TMDL has been developed and approved by USEPA and the approved implementation plan is expected to result in full attainment of the standard within a specified time frame; or
2. It has been determined that an existing regulatory program is reasonably expected to result in the attainment of the water quality standard within a reasonable, specified time frame.

The Section 303(d) list is required to be reviewed and updated every 2 years. The latest list of Section 303(d) List of Water Quality Limited Segments for California was approved by the State of California in 2010, with EPA granting final approval of the list in October, 2011. The locations within San Diego Bay in proximity to the proposed project site that are identified as 2010 CWA Section 303(d) List of Water Quality Limited Segments Requiring TMDLs are presented in Table 8.

Table 8
Water Quality Limited Segments Requiring TMDLs
Located in Proximity to the Proposed Project

Name	Pollutant/ Stressor	Potential Sources	Estimated Size Affected	Proposed TMDL Completion
San Diego Bay	PCBs	unknown	10,783 acres	2019
San Diego Bay Shoreline, at Bayside Park (J Street)	Enterococcus and Total Coliform	unknown	50 acres	2019
San Diego Bay Shoreline, at Coronado Cays	Copper	unknown	47 acres	2019
San Diego Bay Shoreline, Chula Vista Marina	Copper	unknown	0.41 miles	2019

Source: SWRCB 2015

The proposed restoration site is situated within the Sweetwater River Watershed along the eastern edge of San Diego Bay. Water quality within the area is largely affected by surrounding land uses, with both point-source and non-point source discharges contributing contaminants to surface waters. A majority of the land area surrounding the restoration site consists of urban development. Pollutant sources in urban areas include streets, rooftops, and exposed earth at construction sites, automobiles, and landscaped areas. The runoff from these sources is largely confined to the Sweetwater River flood control channel to the north, which is connected to waterways adjacent to the restoration site; however, it does not currently contribute to surface flows on the site given the site's elevation.

Contaminants can enter the Refuge via a variety of transport pathways involving surface water. Urban runoff and storm water from upstream urban areas flow into the Sweetwater River. Some pollutants that can be carried into these waters include fertilizers, pesticides, oil and grease, detergents, coolant, and paint. As part of an assessment for this project, constituents of concern within the restoration site have been evaluated to determine if contaminants/hazardous materials are present in significant amounts. The results of the analysis determined that hazardous materials and contaminants are not present on-site.

The restoration site is composed of intertidal flats, which serve as sheltered inlets that bring tidal exchange to coastal wetlands or as outlets for storm water runoff, nutrients, and sediment supply to the bay and nearshore coast. Intertidal flats may experience sedimentation problems due to reduced tidal prisms and/or erosion and runoff from watersheds. Increased sedimentation, over and above the amount that enters the water system by natural erosion, can cause many adverse impacts on aquatic organisms, water supply, and wetlands. Sedimentation can decrease transmission of light, which affects plant production and leads to loss of food and cover for aquatic organisms. It can change behavioral activities (nesting, feeding, mating), and adversely

affect respiration, digestion, and reproduction. Contaminants and toxic substances can also be transported in sediments. Sediments can damage water treatment equipment, increasing treatment costs. They can reduce reservoir volume and flood storage, and increase peak discharges. Sedimentation beyond natural levels has occurred within the site, as the bay was previously filled with sediments dredged and excavated to create the surrounding channels.

The salinity and temperature characteristics of the south San Diego Bay differ from those areas to the north. This is a result of the natural conditions, including shallow water depths and poor flushing, as well as human-related conditions. With respect to salinity, the area generally between the Coronado Bay Bridge and the Sweetwater Marsh Unit has been described as a seasonally hypersaline region. Here, water is stratified by salinity gradients induced by evaporation. The area south of the Sweetwater River flood control channel is described as the estuarine region. In this region, residence time of bay water can exceed 1 month. During the summer months, the evaporation rate can be as high as 62.7 inches (159 centimeters) per year, causing the bay water in this region to become hypersaline, or saltier than seawater (USFWS 2006; U.S. Navy 2013). While conducting a fish inventory in San Diego Bay in the late 1990s, Allen (1999) observed that salinities in the bay varied depending upon the location in the bay and the time of year. Allen found that salinities in the bay were typically higher than 34 parts per thousand (ppt), the average value for seawater. During the first 2 years of the study, salinities in the bay varied from 39.8 ppt to 33.4 ppt. In October 1996, the South Bay was particularly hypersaline (39.8 ppt).

The Federal CWA amendments of 1987 established a framework for regulating storm water discharges from municipal, industrial, and construction activities under the National Pollutant Discharge Elimination System (NPDES) Permitting Program. As a result of these amendments, municipalities throughout the nation are required to obtain a Municipal NPDES Permit. The primary goal of the permit is to stop polluted discharges from entering the storm water conveyance system and local receiving and coastal waters.

The San Diego Regional Municipal Storm Water Permit (Order R9-2013-0001 [as amended by Order No. R9-2015-0001]) (Municipal Permit) regulates the conditions under which storm water and non-storm water discharges into and from municipal separate storm water systems (MS4s) are prohibited or limited. The 18 cities, County of San Diego government, County of San Diego Regional Airport Authority, and San Diego Unified Port District each owns or operates an MS4, through which it discharges storm water and non-storm water into waters of the U.S. within the San Diego Region. These entities are the County of San Diego Copermittees (Copermittees) which, along with the applicable Orange County and Riverside County Copermittees, are subject to the requirements of the permit. The permit requires the development and implementation of storm water regulations to address storm water pollution issues in planning and construction for

both public and private development projects. Specifically, development projects are required to include storm water BMPs, both during construction and in permanent design, to reduce pollutants discharged from project sites to the maximum extent practicable.

Storm Water Standards have been developed in several municipalities surrounding the bay that are intended to effectively prohibit non-storm water discharges and reduce the discharge of pollutants from storm water systems during construction and throughout the use of a developed site. In California, the SWRCB, through the nine RWQCBs, administers the NPDES storm water municipal permitting program. Any grading proposals in excess of 1 acre would require the incorporation of BMPs into the project design as part of the approval of an NPDES Permit (*Water Quality Order 2012-0006-DWQ - General Permit for Storm Water Discharges Associated with Construction Activity*) from the RWQCB.

In addition, in accordance with Section 401(a)(1) of the CWA, activities that result in discharge of dredge or fill material into navigable waters of the U.S. would most likely require a CWA Section 401 Water Quality Certification from the RWQCB. Some of the permits that require a 401 Certification include permits issued under Section 404 of the CWA and NPDES permits issued by EPA under Section 402 of the CWA. To obtain this certification, the RWQCB must certify that the project would comply with water quality standards related to beneficial uses designated in the Basin Plan for water bodies in Region 9 (San Diego County), water quality objectives, and the Antidegradation Policy, which requires that existing high-quality waters be protected and maintained, unless the need to lower water quality is justified.

Topography and Topographic Constraints

The D Street Fill has a number of minor topographic constraints that, if planned for carefully, can be minimized. The proposed site design may need to consider isolation and avoidance of any hazardous ash materials located to the east of the site. This could be achieved by providing a natural berm and upland habitat and a transitional area along that boundary. The man-made bay is artificial in appearance (square and steep-sided) and supports a narrow band of mid-high salt marsh habitat. This feature may constrain the location of a future tidal inlet for the restoration project; however, this constraint is minimal and can be addressed during project design. Additionally, there is an existing berm feature along most of the southern boundary of the site. This berm is at its greatest height and width just west of the man-made bay. The project design would need to consider this berm feature when selecting ideal tidal inlet/outlet locations to minimize grading needs, as well as allow for more natural transitions throughout the proposed salt marsh site.

4.12 Noise

Noise is unwanted sound that interferes with normal activities or otherwise diminishes the quality of the environment. The effects of noise on people can include general annoyance; interference with speech communication; sleep disturbance; and, in the extreme, hearing impairment. There is wide diversity in human response to noise that varies based on the type and characteristics of the noise source, the sensitivity of the receptor, the time of day (e.g., more sensitive at night), and the distance between noise source and receptor. Sensitive noise receptors are generally considered persons who occupy areas that require quiet, including sleeping, convalescing, and studying. Such areas typically include residential dwellings, mobile homes, hotels/motels, hospitals, nursing homes, educational facilities, and libraries. Protected wildlife (i.e., special-status species) and their habitat may also be considered noise-sensitive receptors, especially during their breeding season.

Noise levels are measured as decibels (dB) on a logarithmic scale that quantifies sound intensity in a manner similar to the Richter scale used for earthquake magnitudes. Thus, a doubling of the energy of a noise source, such as doubling of traffic volume, would not double the noise level, but instead the noise level would increase by 3 dB, which is barely perceptible to the average human ear. Additionally, an increase (decrease) of 5 dB is readily perceptible, and an increase (decrease) of 10 dB sounds twice (half) as loud. Thus, human perception of noise has no simple correlation with acoustical energy (e.g., two noise sources do not sound twice as loud as one source). Typical noise levels for common activities are illustrated in Table 9.

As shown in Table 9, normal conversational speech at 3 feet is approximately 60 dB. In addition, the human ear is not equally sensitive to all frequencies; therefore, sound can be characterized as the “A weighted” sound level (dBA), which gives greater weight to the frequencies audible to the human ear by filtering out noise frequencies not audible to the human ear. Human judgments of the relative loudness or annoyance of a sound correlate well with dBA levels; therefore, the dBA scale is used for measurements and standards involving the human perception of noise.

In addition to instantaneous noise levels, the duration or magnitude of noise over time is also important for the assessment of potential noise disturbance. Noise levels are averaged over a period of time, usually expressed as equivalent noise level for that period or dBA L_{eq}. Time of day is also important as noise levels acceptable during the day may interfere with activities during evening and nighttime hours (e.g., sleep).

Table 9
Typical Noise Levels

Common Outdoor Activities	Noise Level (dBA)	Common Indoor Activities
	--110--	Rock Band
Jet Fly-over at 1,000 feet	--100--	
Gas Lawn Mower at 3 feet	--90--	
Diesel Truck at 50 feet, at 50 mph	--80--	Food Blender at 3 feet Garbage Disposal at 3 feet
Noisy Urban Area, Daytime Gas Lawn Mower at 100 feet	--70--	Vacuum Cleaner at 10 feet
Commercial Area Heavy Traffic at 300 feet	--60--	Normal Speech at 3 feet
Quiet Urban Daytime	--50--	Large Business Office Dishwasher in Next Room
Quiet Urban Nighttime	--40--	Theater, Large Conference Room Background
Quiet Suburban Nighttime	--30--	Library
Quiet Rural Nighttime	--20--	Bedroom at Night, Concert Hall Background
	--10--	Broadcast/Recording Studio
Lowest Threshold of Human Hearing	--0--	Lowest Threshold of Human Hearing

Source: Caltrans 1998

Noise levels naturally attenuate with distance from a source at a rate of 6 dBA per doubling of distance over acoustically hard surfaces (e.g., streets and parking lots), and a rate of 7.5 dBA per doubling of distance for soft site surfaces (e.g., open space with vegetation). Any intervening topography or structures would provide a further reduction.

Noise Sources

The predominant noise sources at the project site are from vehicle traffic on nearby roadways and I-5 and rail traffic approximately 1,000 feet to the east, and boating traffic from the Chula Vista Marina and Sweetwater River flood control channel approximately 700 feet to the north. Additional noise sources include aircraft flyovers from nearby airports and airfields, and human and bird vocalizations in the surrounding area. Due to its remote location with distant noise sources, ambient noise levels within the project site are characterized as relatively low compared to the surrounding urban environment.

Noise Receptors

Noise-sensitive receptors located in proximity to project construction activities include sensitive wildlife species on the restoration site, and live-aboard boats located within the marina

approximately 700 feet from the site. No noise-sensitive receptors are located along the truck haul route for delivery of construction equipment, and the hauling of excavated material for re-use on-site or disposal off-site. The nearest housing to the project site is located approximately 0.5 mile southeast of the D Street Fill, across I-5, in the City of Chula Vista.

Ownership of the D Street Fill is divided between SDUPD and the Service, which jointly manage the northwestern/central portion of the site to support California least tern nesting. In addition, a portion of the D Street Fill is designated as western snowy plover critical habitat for the recovery of this federally listed threatened species.

Applicable Noise Regulations

The restoration site is located within the City of Chula Vista, however, the site is owned by the Service. The Service does not set construction noise limits, but does recommend a noise level of 60 dBA L_{eq} as a threshold for considering potential noise impacts to nesting special-status bird species.

The project truck route traverses Service land, and accesses roadways through private land and the City of Chula Vista and National City. The City of Chula Vista Municipal Code Section 17.24.040C8 prohibits construction noise between hours of 10:00 p.m.-7:00 a.m. Monday – Friday, and 10:00 a.m. - 8:00 a.m. on Saturday and Sunday. 19.68 Section 060 exempts construction/demolition activities from the noise standards in the City's Noise Ordinance (City 2015). The National City Municipal Code Section 12.10.160 prohibits the hours of construction activity between 7:00 p.m.-7:00 a.m., weekdays, weekends, and Federal holidays, and sets maximum construction noise level limits of 75 dBA L_{eq} at residential properties and 85 dBA L_{eq} at commercial properties (National City 2015).

Truck traffic noise generated during the transport of fill material off-site to landfill is subject to policies and standards contained in the City's noise ordinance, which prohibits construction between the hours of 7 p.m. and 7 a.m. and on Sundays and certain legal holidays, unless a permit has been granted beforehand or in conjunction with emergency work. Section 59.5.0404 limits construction noise to an average sound level of 75 dBA during the 12-hour period from 7 a.m. to 7 p.m. at or beyond the property lines of any property zoned residential.

4.13 Traffic

Project construction traffic would utilize area roadways during the transport of construction equipment and workers to the site, and during the hauling of excavated soil for placement on-site or off-site disposal. During project mobilization and demobilization, construction equipment

would be transported by transport truck to the project site from I-5 via the approved local access route (Figure 1) along Bay Marina Drive/East 24th Street, Marina Way, and parallel to the Bayshore Bikeway to the project site

For the off-site soil disposal alternative, excavated soil would be transported by truck from the project site via the same mobilization route to I-5 (i.e., Marina Way, Bay Marina Drive/East 24th Street), and then I-5 north to SR 54 east, I-805 south, Main Street east, and Maxwell Road north to the Otay landfill (Figure 7).

Average daily traffic volumes on the project segments of the truck routes to the project site and landfill are provided by Caltrans and SANDAG, and are shown in Table 10.

Table 10
Traffic Volumes on Project Roadways

Project Roadways	Traffic Volumes
Marina Way *	-
East 24th Street*	9,400
I-5	165,000
I-805	138,000
SR-94	113,000
Main Street **	35,700
Maxwell Road **	3,800

* National City, ** City of Chula Vista, no data provided
Sources: SANDAG 2010, Caltrans 2013

4.14 Public Access and Recreational Opportunities

The D Street Fill is, and would continue to be, closed to all public access per the management guidance provided in the Final San Diego Bay NWR CCP/EIS. The only exception involves approved research activities conducted under the auspices of a Refuge Special Use Permit. All boating is permitted in San Diego Bay, the tidal channels within the Sweetwater Marsh Unit are closed to all forms of boating. In addition, fishing is not permitted within the Sweetwater Marsh Unit. Opportunities for fishing are available immediately adjacent to the Refuge in San Diego Bay.

Figure 7 Otay Landfill Route

8 ½ X 11

Bicycle Facilities

The primary bicycle facility in the South Bay is the Bayshore Bikeway, an approximately 25-mile bicycle facility around San Diego Bay that traverses through the five cities surrounding the bay. The Bayshore Bikeway consists of combination of multi-use paths, bike lanes, and routes providing convenient and scenic bicycle transportation around the bay. In the vicinity of the Sweetwater Marsh Unit, the Bayshore Bikeway is a multi-use path that provides off-road bicycle access from National City, near Pepper Park, to E Street in Chula Vista, skirting the eastern edge of the Refuge. The multi-use path is a completely separate path for shared use by bike riders, pedestrians, and other nonmotorized users with minimal vehicle crossings.

To the south, in the vicinity of the South San Diego Bay Unit, is a multi-use path of the Bayshore Bikeway that extends west from H Street to Orange Street in Chula Vista around the south end of the bay and up the Silver Strand to Coronado. This segment of the bikeway provides spectacular views of the salt ponds and the southern end of the bay. One small segment along this section of the Bayshore Bikeway in Chula Vista is a bike lane (a striped lane for one-way bike travel on the street) from Orange Avenue that extends to the south to Main Street. This section is identified as a near-term bikeway project planned by San Diego Association of Governments (San Diego Regional Bike Map 2015).

Developed Park Land

A number of active parks are in the vicinity of the Refuge, including Chula Vista Bayside Park at the foot of Marina Way, Chula Vista Bayside Park at the end of Bayside Parkway, Chula Vista Marina View Park on Marina Park Way at Marina Way, Coronado Grand Caribe Shoreline Park, Bayside Park adjacent to 8th Street in Imperial Beach, and Pepper Park in National City. Silver Strand State Beach is located to the northwest of the South San Diego Bay Unit.

5.0 ENVIRONMENTAL CONSEQUENCES

5.1 Introduction

This chapter includes an evaluation of the environmental impacts associated with implementation of Coastal Wetland Restoration at the D Street Fill Sweetwater Marsh Unit of the San Diego Bay National Wildlife Refuge and is intended to provide information needed for making informed decisions about the proposed project. Only those issues that are potentially affected by the proposed project are addressed, and the analysis provided tiers from the programmatic EIS that was prepared in conjunction with the San Diego Bay NWR CCP (USFWS 2006). The EIS and ROD are incorporated by reference into this document.

In accordance with CEQ regulations (40 CFR Sections 1508.7 and 1508.8), direct, indirect, and cumulative impacts of a Federal action must be addressed and considered by Federal agencies in satisfying the requirements of the NEPA process. The determination of a significant impact is a function of both context and intensity. Intensity refers to the severity of impact. To determine significance, the severity of the impact must be examined in terms of the type, quality, and sensitivity of the resource involved; the location of the proposed project; the duration of the effect (short- or long-term); and other consideration of context. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts. The criteria considered when determining whether the implementation of the alternatives, including the proposed action, would result in a significant effect on the environment are presented below under each topic heading.

5.2 Air Quality

Thresholds of Significance

Implementation of the proposed action would have a significant adverse direct effect on air quality if proposed actions would result in emissions equal to or in excess of the standards outlined in SDAPCD Rule 1501, Conformity of General Federal Actions, resulting in a violation of any air quality standard or contribute substantially to an existing or projected air quality violation; or sensitive receptors would be exposed to substantial pollutant concentrations, including diesel PM.

General conformity *de minimis* thresholds are appropriate thresholds to be used for determining NEPA significance. The total annual emissions of attainment pollutants, as well as the emissions of nonattainment/maintenance pollutants (analyzed for General Conformity) from construction activities would be compared against the *de minimis* levels for the attainment status of these pollutants. The applicable *de minimis* thresholds for the SDAB are shown in Table 11.

Project alternatives with the potential to generate emissions exceeding the thresholds would have an adverse effect on air quality. If the emissions to be generated by a project alternative exceed the significance criteria, mitigation measures are available, depending on the nature of the air quality effect.

5.2.1 Impact Analysis: Proposed Action

Construction emissions are described as “short-term” or temporary in duration; however, they have the potential to represent an impact with respect to air quality. Construction of the proposed

Table 11
Applicable General Conformity/NEPA Significance Thresholds

Pollutant	*De minimis* Emission Threshold (tons/year)
CO	100
NO_X	100
VOC	100
SO_X	100
PM_{10}	100
$PM_{2.5}$	100

Source: 40 CFR Part 93

action would result in the temporary generation of VOC, NO_X, CO, SO_X, PM_{10}, and $PM_{2.5}$ emissions. VOC, NO_X, and CO emissions are primarily associated with mobile equipment exhaust, including off-road construction equipment and on-road motor vehicles. Fugitive PM dust emissions are primarily associated with site preparation and vary as a function of such parameters as soil silt content, soil moisture, wind speed, acreage of disturbance area, and vehicle miles traveled by construction vehicles on- and off-site. Earthmoving and material handling operations are the primary sources of fugitive PM dust emissions from the proposed construction activities.

As discussed in Chapter 3, construction activities would include (1) equipment mobilization, demobilization, access, and staging areas, (2) clearing and grubbing existing vegetation, (3) earthwork to lower elevations, (4) re-use of soils, and (5) planting of salt marsh and transitional habitats. Estimated equipment needed for construction, as shown in Table 3, includes two bulldozers, two excavators, four dump trucks, and one water truck. Earthwork is the major construction activity of the proposed action, which includes the excavation of approximately 125,000 cubic yards of soil and the removal of the excavated material from the site. Excavated material would be loaded into four dump trucks and trucked on unpaved access roads for placement within the D Street Fill. Re-use of soil for the proposed action would occur on unpaved roads and would also result in generation of fugitive PM dust emissions.

Construction-related emissions were modeled using the California Emissions Estimator Model (CalEEMod), Version 2013.2.2. CalEEMod allows the user to enter project-specific construction information, such as types, number, and horsepower of construction equipment, and number and length of off-site motor vehicle trips. Vehicle fleet characteristics and data specific to San Diego County or specific to the project were used in place of CalEEMod defaults, where available. The

project specific information includes haul trips associated with material re-use consistent with Table 4 of the project description.

As shown in Table 12, construction emissions for the proposed action would result in maximum annual emissions of approximately 0.36 ton of VOC, 4.08 tons of NOx, 2.59 tons of CO, 0.004 ton of SO_2, 1.37 tons of PM_{10}, and 0.40 ton of $PM_{2.5}$. Additional modeling assumptions and details are provided in Appendix A.

Table 12
Proposed Action – Estimated Annual Construction Emissions

	VOC	**NO_X**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
2015	0.36	4.08	2.59	0.004	1.37	0.40
2016	0.19	1.85	1.56	0.002	1.13	0.24
Maximum Annual Emissions	0.36	4.08	2.59	0.004	1.37	0.40
General Conformity *de minimis* Threshold (tons/year)	100	100	100	100	100	100
Exceed Thresholds?	No	No	No	No	No	No

VOC = volatile organic compounds; NO_X = oxides of nitrogen; CO = carbon monoxide; SO_2 = sulfur dioxide; PM_{10} = suspended particulate matter; $PM_{2.5}$ = fine particulate matter
Source: Estimated by AECOM in 2015

As shown in Table 12, construction-generated emissions of VOC, NO_X, CO, SO_2, PM_{10}, and $PM_{2.5}$ would be less than the General Conformity *de minimis* thresholds. Therefore, the proposed action would not result in a substantial adverse effect related to a violation of any air quality standard or contribute substantially to an existing or projected air quality violation. There would be no significant adverse air quality effects.

The greatest potential for HAP or TAC emissions related to the proposed action would originate from diesel PM emissions associated with off-road equipment operations. The generation of diesel PM emissions from construction projects typically occurs in a single area for a short period of time. Construction emissions would occur intermittently throughout the day, as construction equipment is required, rather than as a constant plume of emissions from the project site. All construction emissions would cease following completion of the proposed action.

According to the Office of Environmental Health Hazard Assessment (OEHHA), health risk assessments that determine the health risks should be based on a 30-year exposure period (OEHHA 2015). However, heath risk assessments should be limited to the period/duration of activities associated with the emissions activity. Construction of the proposed action would occur for a total of 5 months. Therefore, the total exposure time would be approximately 1% of the

total exposure time for a typical health risk assessment. In addition, the buffer distance from the nearest sensitive receptors would provide a substantial distance for concentrations to dilute to nominal levels. ARB has published studies that show a 70% decrease in PM emissions at 500 feet from freeways and high-traffic roads, which are continuous emission sources (ARB 2005). Therefore, considering the substantial buffer distance to the nearest sensitive receptors, intermittent emission source, relatively low overall exposure period, and the highly dispersive nature of diesel PM emissions, the proposed action would not result in a substantial adverse effect related to the exposure of sensitive receptors to substantial pollutant concentrations.

Mitigation Measures

No mitigation measures are required for the proposed action. Nevertheless, BMPs, which have been incorporated into the scope of the project, would be implemented during excavation to minimize the effects of dust on local air quality and adjacent wetland habitat.

5.2.2 Impact Analysis: No Action (Alternative A)

This alternative assumes the restoration project is not implemented and there is no change from existing management programs. This alternative serves as the baseline to which all other action alternatives are compared. There would be no major changes in habitat management under this alternative. Since no increase in construction activities would occur under Alternative A, criteria pollutant emissions would also not increase. Therefore, Alternative A would not result in a substantial adverse effect related to a violation of any air quality standard or contribute substantially to an existing or projected air quality violation.

5.2.3 Impact Analysis: Alternative C

Implementation of Alternative C would be the same as the proposed action, except the excavated material (approximately 125,000 cubic yards of soil) would be trucked off-site for disposal. This analysis assumes the soil would be hauled to the Otay Landfill in the City of Chula Vista, approximately 12 miles from project site.

As shown in Table 13, construction emissions for Alternative C would result in maximum annual emissions of approximately 0.41 ton of VOC, 4.83 tons of NO_X, 3.10 tons of CO, 0.006 ton of SO_2, 0.57 ton of PM_{10}, and 0.34 ton of $PM_{2.5}$. Additional modeling assumptions and details are provided in Appendix A.

Table 13
Alternative C - Estimated Annual Construction Emissions

	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
2015	0.41	4.83	3.10	0.006	0.57	0.34
2016	0.26	2.98	2.42	0.005	0.34	0.19
Maximum Annual Emissions	0.41	4.83	3.10	0.006	0.57	0.34
General Conformity *de minimis* Threshold (tons/year)	100	100	100	100	100	100
Exceed Thresholds?	No	No	No	No	No	No

VOC = volatile organic compounds; NO_X = oxides of nitrogen; CO = carbon monoxide; SO_2 = sulfur dioxide; PM_{10} = suspended particulate matter; $PM_{2.5}$ = fine particulate matter
Source: Estimated by AECOM in 2015

As shown in Table 13, construction-generated emissions of VOC, NO_X, CO, SO_2, PM_{10}, and $PM_{2.5}$ for Alternative C would be less than the General Conformity *de minimis* thresholds. Therefore, no significant adverse air quality impacts would occur under Alternative C.

Similar to the proposed action, Alternative C would generate diesel PM emissions associated with off-road equipment and haul truck operations. Based on the substantial buffer distance to the nearest sensitive receptor, intermittent emission source, relatively low overall exposure period, and the highly dispersive nature of diesel PM emissions, Alternative C would not result in a substantial adverse effect related to the exposure of sensitive receptors to substantial pollutant concentrations.

Mitigation Measures

No mitigation measures are required for Alternative C. Nevertheless, BMPs, which have been incorporated into the scope of the project, would be implemented during excavation to minimize the effects of dust on local air quality and adjacent wetland habitat.

5.3 Biological Resources

Thresholds of Significance

As noted previously, for the purpose of this analysis, biological resources are grouped into three separate categories: habitat and vegetation, wildlife and fisheries, and endangered and threatened species and other species of concern.

- An effect to habitat and vegetation would be considered significant if the proposed project would result in substantial modification of existing habitat or vegetation within or surrounding the project site.

- An effect to wildlife and fisheries would be considered significant if the proposed project would substantially change the amount or quality of available habitat to support one or more fish or wildlife species; substantially interfere with the movement of native resident or migratory wildlife species; and/or result in a substantial change in the local population of one or more fish or wildlife species.
- An effect to endangered and threatened species, as well as any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations; or by CDFW and the Service, or by California Native Plant Society; or any avian species identified as a Bird of Conservation Concern would be considered significant if the action would substantially alter species presence, species reproductive success, species movement, or the availability of appropriate habitat to support such species.

5.3.1 Impact Analysis: Proposed Action

This alternative involves the restoration of the entire 12.44-acre restoration site and subsequent on-site re-use of excavated material over approximately 29.85 acres of a California least tern nesting site located to the northwest of the restoration site.

Habitat and Vegetation

Implementation of the restoration project would impact 0.23 acre of tidally influenced southern coastal salt marsh, 1.92 acres of nontidal disturbed coastal salt marsh, 5.32 acres of baccharis scrub and 29.85 acres of a California least tern nesting site located to the northwest of the restoration site that is considered disturbed upland habitat. This impact is considered less than significant as the restoration project would result in an increase in higher quality habitat with greater ecological functionality than that being lost. Additionally, sensitive habitat and plants would be avoided/and or salvaged resulting in a less than significant impact to sensitive habitat and plants.

There is potential for the increased presence of weeds within the nesting site after project implementation. The disturbance and redistribution of soils may enable weedy plant species to invade the site in increased densities over the present condition. However, ongoing Refuge maintenance and monitoring of the site, which includes undesirable plant control and noxious weed eradication efforts, would address any increases in weed production prior to commencement of each nesting season.

The restoration plan calls for the creation of 6.6 acres of low salt marsh, 2.83 acres of mid-high salt marsh, 0.98 acre of mudflat, 0.62 acre of open water, and 1.41 acres of upland habitat maximizing salt marsh diversity, a core goal of the CCP.

Approximately 0.23 acres of existing high-quality salt marsh habitat that occurs on the slopes of the square-shaped embayment would be salvaged for later replanting. Thus, the restoration program will temporarily impact 0.23 acre of moderate quality salt marsh. Mitigation for this temporary impact has been built into the scope of the project by increasing the wetland mitigation beyond that required by the CCC. The substation relocation will impact 2.42 acres of waters of the U.S. and State. Mitigation at a 4:1 ratio requires restoration of 9.68 acres of coastal wetland habitats. Additional mitigation for impacts to 0.23 acre of on-site coastal salt marsh will result in a total requirement of 9.91 acres. The restoration program will create 11.03 acres of wetland habitats; however, based on the functional lift assessment conducted by the CCC for the site, 0.19 acre of restoration will not receive credit. Therefore, the restoration credit achieved by the restoration project will be 10.61 acres, exceeding requirements by 0.7 acre.

Plants would be salvaged using an excavator or backhoe and would include approximately 1 foot of soil as well as the aboveground biomass of the plants. Salvaged plants would be stored on-site in basins lined with polyethylene or similar impervious plastic. Salvaged plant storage areas would be located in existing disturbed areas within the project limit of work. Plants would be watered during the storage period as directed by the Restoration Ecologist and Construction Manager.

Harvesting of cordgrass plugs would be overseen by the Restoration Ecologist in coordination with the Refuge Manager. Harvesting and transplantation of cordgrass would be conducted during the non-breeding season of sensitive bird species, defined as September 30 – February 15 by the Service, unless work outside this period is authorized by the Service. Should construction activities, including cordgrass harvesting, occur during the breeding season, a nesting bird survey would be conducted to determine the presence of nests or nesting birds within 500 feet of the construction activity. The nesting bird survey(s) will be conducted no more than 72 hours prior to construction activities. All ground-disturbing activities within 500 feet of an active nest will be halted until that nesting effort is finished.

All work areas, including those adjacent to existing coastal wetland habitat, will be fenced with orange construction fencing to prevent access and trampling, and silt fence in accordance with the SWPPP to prevent any movement of sediment beyond the active construction area. Fugitive dust from excavation and transportation of sols from the restored site to the reuse site are not expected to affect existing wetland areas as they will be wetted diurnally by tides.

Beach goldenaster and coast woolly-heads were observed in the northeastern portion of the restoration site and may also be impacted by restoration activities. To minimize impacts to these species, a seasonal focused rare plant survey would be conducted to document the sensitive plant populations on-site prior to construction. If sensitive plant species are identified within the proposed restoration footprint, and if avoidance is not feasible, salvage of plants and/or seeds and replanting within the restoration area would occur to the extent feasible. Salvage and reintroduction of seeds and plants would reduce the potential for any adverse effects to sensitive plant species from the proposed project.

Implementation of the restoration project is not expected to cause direct impacts to eelgrass; however, indirect impacts to eelgrass can occur if construction sediment and turbidity shades the eelgrass beds or covers them with sediment. Measures would be implemented to avoid and monitor for indirect impacts to eelgrass. Avoidance of indirect impacts would be achieved through the creation of a SWPPP, implementation of storm water BMPs to prevent erosion and sedimentation, and through implementing a strategic grading process that would prevent actively graded areas from being exposed to tides. The process would leave a narrow berm of soil directly adjacent to the square-shaped subtidal embayment in place until all other grading is complete. The remaining berm of soil would be removed last, thus limiting the exposure of active grading to tidal action. The monitoring program would include pre-construction and post-construction eelgrass surveys in the square-shaped subtidal embayment and the immediately adjacent tidal channel for a distance of approximately 400 feet to the east and to the west. Pre-construction surveys would document existing eelgrass populations. Post-construction surveys shall continue through the 2-year monitoring period in accordance with the NOAA Fisheries' Southern California Eelgrass Mitigation Policy to confirm no long-term indirect impacts to eelgrass populations have occurred. If impacts are identified, re-initiation of consultation with the USACE or NOAA Fisheries is required and shall be requested.

Wildlife and Fisheries

The implementation of the restoration project would result in temporary disturbances to relatively low numbers of wildlife that forage and otherwise utilize the existing restoration site. Biological monitoring and other relevant avoidance measures outlined in the Final CCP/EIS would be implemented during construction for nesting birds, sea turtles, jackrabbits, and marine mammals.

By avoiding construction on D Street Fill during the nesting season (February 15 to September 30), adverse effects to breeding avian species would be minimized. The restoration of coastal wetland habitats would provide moderate benefits to a variety of migratory birds and other wildlife by expanding the availability of foraging and resting opportunities currently found within the site.

The restoration project would increase tidal habitat, which would benefit fish species. Minor short-term impacts to fish species could arise as a result of the construction, including sedimentation. Measures discussed above to minimize impacts to eelgrass would also apply here and result in a similar minimization of impacts to aquatic wildlife. Once complete, the resulting additional intertidal habitat would provide long-term cumulative benefits for a variety of San Diego Bay's fish population. These benefits include improved foraging habitat and expanded areas of habitat suitable for fish nurseries.

Open water bordering the restoration site may periodically support pinnipeds protected by the Marine Mammal Protection Act and the federally listed endangered green sea turtle, which are known to occur in south San Diego Bay. Standard construction BMPs and monitoring during construction would be implemented. Section 7 consultation has occurred with the Service and NMFS pursuant to Section 7 of the Federal Endangered Species Act and Section 305(b) of the Magnuson-Stevens Act regarding potential impacts to California least terns and other nesting birds, green sea turtles, marine pinnipeds, and Essential Fish Habitat. A concurrence letter was received on May 14, 2015 and a Refuge Special Use Permit will be issued.

The Section 7 consultation included seven conditions, as summarized below:

1. Work shall be authorized only during the non-nesting season for all potentially nesting avian species in the area, unless authorized by the Service.
2. Crews are not authorized to impact of traverse any marsh habitat with heavy equipment although it may be necessary for small linear sections of existing marsh habitat to be impacted during construction.
3. Light-footed Ridgway's rails are infrequently observed in the marsh habitats adjacent to the project area in small numbers. These light-footed Ridgway's are likely habituated to human presence due to management and monitoring activities in the area.
4. Work equipment will not be authorized to remain on site overnight without being moved to a designated parking area to avoid potential collision with birds flying at night or during periods of low visibility.
5. Oil and fuel containment and cleanup materials will be mandated to be present on site during construction.
6. A qualified biological monitor shall be present during construction activities to monitor for any behavioral responses to the project by resident light-footed Ridgway's rails that may be detectable.

7. A qualified biological monitor shall be present during construction activities to monitor for any behavioral responses to the project by wintering snowy plovers that may be detectable.

In NOAA's Letter of Concurrence on marine mammals, Essential Fish Habitat and green sea turtles, the following avoidance and minimization measure was endorsed:

"The primary avoidance and minimization measure includes retention of an existing berm at the interface of the Sweetwater River Channel and grading/contouring construction of subtidal channels into restored salt marsh area until the final phase of construction, in order to prevent green turtles from entering the construction site. During the final phase of construction after the berm has been removed, visual monitoring of the project area during construction activities shall occur, and work will be suspended if green turtles are observed in the mitigation site until the turtles leave the construction site."

Endangered and Threatened Species and Other Species of Special Concern

The habitat restoration proposed under this alternative would temporarily impact some sensitive species; however, implementation of mitigation measures Bio-1 thru Bio-8 identified below would reduce these impacts to a less than significant level. Additionally, the implementation of the restoration project would increase intertidal salt marsh habitat, which supports the recovery of several listed species within the NWR.

Temporary impacts to nesting birds, such as the federally listed endangered light-footed Ridgway's rail and State listed endangered Belding's savannah sparrow would be offset by the increase in quality habitat resulting from the project. Approximately 7.5 acres of marginal wetland/upland habitat and 5 acres of unvegetated fill would be restored to 12.44 acres of high-quality, high functioning habitat. Restoration construction activities on D Street Fill that include excavating, grading, and hauling of materials with large equipment would occur outside of the nesting season (September 30 through February 15) to avoid disturbance to birds protected by the Migratory Bird Treaty Act that may nest on-site, and the numerous sensitive bird species (e.g., California least tern, Belding's Savannah sparrow, light-footed Ridgway's rail) known to nest in the immediate vicinity. Restoration construction activities using hand labor such as boundary staking, planting, and irrigation may be allowed within the nesting season if adequate avoidance measures are implemented and based on approval of the Refuge Manager. These include pre-construction surveys, non-disturbance buffers, and contractor education. Non-disturbance buffer zones would be determined in coordination with the Service.

The implementation of this alternative would result in temporary impacts to 29.855 acres California least tern nesting habitat, but would result in an enhanced nesting area for not only least tern, but also western snowy plover, a species that does not currently nest on the D Street Fill. The enhancement in this case is a generally flatter and higher area to support least tern nesting. Increase height allows for better visual access to approaching predators. The increased elevation of the nesting area also may provide a buffer to sea level rise if the site continues to be used by least terns when future sea levels are significantly different than the present condition. In addition to temporary impacts resulting from the restoration project noted above, this alternative would create temporary impacts to California least tern nesting habitat while the excavated material is spread throughout this area and graded according to the site restoration plan (SDG&E 2014). This work would involve the salvage and stockpiling of the nesting material layer (coarse sand and shells) prior to ground-disturbing activity associated with the restoration outside the nesting season; the raising of the existing nesting area by 8 feet, to a uniformly flattened area with a 20:1 slope down to the water around the entire site; and, the reapplication of the nesting material. This work would take place outside the nesting season and would result in a net benefit to the California least tern and potentially the western snowy plover. Raising and flattening the site while creating 20:1 slopes would be an improvement over the currently undulating surface that does not provide for a clean line of site for nesting least terns In accordance with the predator management plan for the NWR, plants within the transition zone of the restoration site cannot provide perches, refuge, or nesting habitat for predators of California least tern. The Restoration Ecologist, in conjunction with the Refuge Manager, will ensure that the quality of surface material that currently supports nesting least terns is restored following construction. In order to ensure that this material is not lost during construction, stockpiles would be protected from wind through the use of breathable coverings for the duration of the project.

Although no western snowy plovers currently nest at the D Street Fill, a portion of this area is designated as critical habitat for the plover. The 20:1 slopes of the new nesting area were designed to be accessible to western snowy plover chicks. The chicks of this species require access to foraging areas such as mudflats or beaches prior to them becoming volant (acquiring the ability to fly); therefore, steep slopes or drop offs would not be suitable for this age class of western snowy plovers.

Impacts to wandering skipper butterflies would be minimized by conducting focused surveys for adult wandering skipper butterflies during the flight period and selectively timed vegetation removal. Vegetation removal on the restoration site would occur in the fall, when nectaring adults are less likely to be present, therefore minimizing direct impacts to this species. In addition, the restoration plan includes planting of nectar and larval host plants for this species (e.g., saltgrass) on 4.24 acres of mid-high salt marsh and transition zone habitats combined, resulting in an improvement of potential habitat on D Street Fill over current conditions.

Mitigation Measures

Bio-1 Implement Best Management Practices. Avoidance of indirect impacts to eelgrass and aquatic wildlife would be achieved through the implementation of a Storm Water Pollution Prevention Plan (SWPPP) and storm water best management practices (BMPs) to prevent erosion and sedimentation. A strategic grading process shall also be implemented to prevent actively graded areas from being exposed to tides. The process would leave a narrow berm of soil directly adjacent to the square-shaped subtidal embayment in place until all other grading is complete. The remaining berm of soil would be removed last, thus limiting the exposure of active grading to tidal action. The monitoring program would include pre-construction and post-construction eelgrass surveys in the square-shaped subtidal embayment and the immediately adjacent tidal channel for a distance of approximately 400 feet to the east and to the west. Pre-construction surveys shall document existing eelgrass populations. Post-construction surveys shall continue through the 2-year monitoring period in accordance with the NOAA Fisheries' Southern California Eelgrass Mitigation Policy to confirm no long-term indirect impacts to eelgrass populations have occurred. If impacts are identified reinitiation of consultation with the USACE or NOAA Fisheries is required and shall be requested.

Bio-2 Timing of Construction. To avoid impacts to nesting birds, construction on D Street Fill shall be confined to the period between September 30 and February 15, unless work outside this period is authorized by the Service. In addition, biological monitoring shall be performed to reduce impacts to wildlife such as nesting birds, sea turtles, jackrabbits, and marine mammals. If an animal is believed to be at risk based on the Restoration Ecologist's judgment, construction shall be suspended until the animal moves out of harm's way on its own or through relocation measures approved by the regulatory agencies.

Bio-3 Protected Species Monitoring. Impacts to pinnipeds protected by the Marine Mammal Protection Act and federally listed endangered East Pacific green sea turtles would be mitigated through standard construction BMPs and monitoring during construction. If an animal is believed to be at risk based on the Restoration Ecologist's judgment, construction shall be suspended until the animal moves out of harm's way on its own or through relocation measures approved by the regulatory agencies. SDG&E has completed consultation with the Service and NOAA Fisheries pursuant to Section 7 of the Federal Endangered Species Act and Section 305(b) of the Magnuson-Stevens Act regarding potential impacts to California least terns and other nesting birds, East Pacific green sea turtles, marine pinnipeds, and Essential Fish Habitat. A concurrence letter from NOAA Fisheries was received on May 14, 2015 and a Refuge Special Use Permit will be issued by the Service.

Bio-4 Protection of Listed Species. Restoration construction activities on D Street Fill that include excavating, grading, and hauling of materials with large equipment would occur outside of the nesting season (September 30 through February 15, unless work outside this period is authorized by the Service) to avoid disturbance to birds protected by the Migratory Bird Treaty Act or the Endangered Species Act that may nest on-site, and the numerous sensitive bird species (e.g., California least tern, Belding's savannah sparrow, light-footed Ridgway's rail) known to nest in the immediate vicinity. The harvesting and transplantation of salt marsh plants shall occur during the non-breeding season of sensitive bird species, unless authorized by the Service following verification that no nests occur in proximity to the collection area. Restoration construction activities using hand labor such as boundary staking, planting, and irrigation may be allowed within the nesting season if adequate avoidance measures are implemented. These include pre-construction surveys, nondisturbance buffers, and contractor education. Non-disturbance buffer zones would be determined in coordination with the Refuge Manager.

Bio-5 Enhance Nesting Opportunities. The excavation and grading work would involve the salvage and stockpiling of the nesting material layer (coarse sand and shells) prior to ground-disturbing activity associated with the restoration outside the nesting season; the raising of the existing nesting area by up to 8 feet, to a uniformly flattened area with a 20:1 slope around the entire site; and, the reapplication of the nesting material. This work would take place outside the nesting season and would result in a net benefit to the California least tern and potentially the western snowy plover. Raising and flattening the site while creating 20:1 slopes would allow for a clear line of sight to potential predators, which is a key nest selection criterion for California least tern. In accordance with the predator management plan for the NWR, plants within the transition zone of the restoration site should not provide perches, refuge, or nesting habitat for predators of California least tern. Management actions by the Refuge to control undesirable plants or noxious weeds with the goal of maintaining an optimal nesting substrate for ground nesting seabirds and shorebirds would continue annually after project completion and prior to each nesting season.

Bio-6 Butterfly Surveys. Impacts to wandering skipper butterflies would be minimized by conducting focused surveys for adult wandering skipper butterflies during the flight period and selectively timed vegetation removal. Vegetation removal on the restoration site shall occur in the fall, when nectaring adults are less likely to be present to minimize impacts to this species.

Bio-7 Plant Salvage. Existing native salt marsh vegetation that occurs on the slopes of the existing square-shaped embayment would be salvaged for later replanting. Plants would be salvaged using an excavator or backhoe and would include approximately 1 foot of soil as well as the aboveground biomass of the plants. Salvaged plants would be stored on-site in basins lined with polyethylene or similar impervious plastic. Salvaged plant storage areas would be located in

existing disturbed areas within the project limit of work. Plants would be watered during the storage period as directed by the Restoration Ecologist and Construction Manager.

Bio-8 Surveying. To minimize impacts to sensitive plant species, a seasonal focused rare plant survey shall be conducted to document the sensitive plant populations on-site prior to construction. If sensitive plant species are identified within the proposed restoration footprint, and if avoidance is not feasible, salvage of plants and/or seeds and replanting within the restoration area would occur to the extent feasible.

5.3.2 Impact Analysis: No Action (Alternative A)

This alternative assumes the restoration project is not implemented and there is no change from existing management programs. This alternative serves as the baseline to which all other action alternatives are compared. There would be no major changes in habitat management under this alternative. No biological resources would be adversely affected by this alternative and the benefits associated with wetland restoration would not be realized.

5.3.3 Impact Analysis: Alternative C

This alternative involves the restoration of the entire 12.44-acre restoration site as noted in Alternative B; however, it differs in the re-use of the subsequent excavated fill material from on-site to off-site disposal.

Impacts and benefits resulting from the restoration project are the same for this alternative as they were for Alternative B with the exception of the effects associated with re-use of the excavated material from the restoration site. Under Alternative C, the material excavated from the restoration site would be transported off-site rather than spread over the majority of the managed California least tern nesting site on the D Street Fill. This alternative eliminates temporary impacts to the nesting site associated with the salvage of nesting material, raising and leveling the nesting area, and reapplication of nesting material, however the long term benefits to the least tern nesting area of applying the material to the site would not be realized. The fill would instead be transported off-site to the Otay Landfill in Chula Vista.

Mitigation Measures

All mitigation measures excluding Bio-5 are identical to Alternative B as described above and are not repeated here.

5.4 Cultural Resources

Thresholds of Significance

Section 106 (16 USC 470f) of the NHPA requires Federal agencies, prior to taking action, to take into account the effects of their undertaking on historic properties. Specific regulations regarding compliance with Section 106 state that although the tasks necessary to comply with Section 106 may be delegated to others, the Federal agency is ultimately responsible for ensuring that the process is completed according to statute. The four steps in the Section 106 process are:

- Identify and evaluate historic properties;
- Assess adverse effects of the project on historic properties;
- Resolve any adverse effects of the project on historic properties in consultation with the State Historic Preservation Officer (SHPO)/Tribal Historic Preservation Officer, and other interested parties, resulting in a Memorandum of Agreement (MOA); and
- Proceed in accordance with the MOA.

To determine if the proposed action could affect a cultural resource, it is necessary to conduct a survey of the APE to determine if any resources identified are eligible for inclusion in the NRHP. The APE is defined as the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties. As described under the project description the APE includes the 12.44 acre restoration site, the 29.85 acre soil reuse site, on-site staging areas, and potential off-site staging areas (Figure 1). The APE is influenced by the scale and nature of the proposed action and may be different with reference to different effects of the action. In addition, the APE is not always a contiguous area, as there may be multiple alternative project sites or multiple areas in which changes are anticipated.

An adverse effect to cultural resources would occur if a resource listed in or eligible for listing in the NRHP could be physically damaged or altered, isolated from the context associated with its listing, or affected by the project elements that would be out of character with the property or its setting. In addition, Title 36 CFR Part 800 defines effects and adverse effects on historic resources as follows:

> Section 8005.5(1) Criteria of Adverse Effects. An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials,

workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the NRHP. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance or be cumulative.

5.4.1 Impact Analysis: Proposed Action

The Service's Regional Cultural Resources staff has determined that the proposed action is a routine undertaking (i.e., an action with little or no potential to affect historic properties), therefore, the action falls under the terms of the Service's Programmatic Agreements (PA) with 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 in which 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, phone call, or e-mail message 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.

Based on the nature of the activities proposed, an Appendix B determination (requiring a record search and field survey) was made for the proposed action. The record search and field survey conducted for the project identified no historic properties within the APE. Therefore, the project is anticipated to have no effect to historic properties. Given the land use history of the project area (e.g., area was filled with dredge spoils), the potential for intact archaeological sites is considered low. However, the possibility exists that archaeological sites may have been covered

over by fill and that intact archaeological deposits may exist within the APE. To avoid the potential for any unanticipated adverse effects to cultural resources, mitigation measures, as described below, have been incorporated into the scope of the project.

Mitigation Measures

Cul-1 Archaeological Monitoring. Monitoring by a qualified archaeologist and a Kumeyaay Cultural Monitor shall be conducted as the D Street Fill area is being capped with fill material and throughout the excavation phase of the project. In the event that human remains are encountered during ground-disturbing activities, all work in the immediate vicinity shall cease and the Medical Examiner will be contacted, per the California Public Resources Code. Should the remains be identified as Native American, the Medical Examiner will contact the Native American Heritage Commission within 24 hours of identification to provide a most likely descendent to determine appropriate actions All human remains would be treated in accordance with the Native American Graves Protection and Repatriation Act (NAGPRA). Additionally, if cultural resources are encountered during ground-disturbing activities, work in the immediate vicinity shall be suspended until the discovery is assessed by a qualified archaeologist and treatment is determined.

5.4.2 Impact Analysis: No Action (Alternative A)

This alternative assumes the restoration project is not implemented and there is no change from existing management programs. This alternative serves as the baseline to which all other action alternatives are compared. There would be no major changes in habitat management under this alternative. No historic properties would be affected by this alternative.

5.4.3 Impact Analysis: Alternative C

Alternative C differs from Alternative B only in manner in which the material excavated from the restoration site is handled. Under Alternative C, the excavated material would be disposed of offsite.

Mitigation Measures

All mitigation measures are identical to Alternative B as described above and are not repeated here.

5.5 Contaminants

Thresholds of Significance

Adverse effects related to contaminants are considered significant when constituents of concern are present in or could be introduced into the sediment, soil, groundwater, or surface water at levels that exceed established criteria, such as Surface Water Quality Criteria, or thresholds above which risks for adverse effects require further consideration. Examples of thresholds include readily available generic screening levels (e.g., EPA Ecological Soil Screening Level for soil, and NOAA's Effects Range Low's for sediment), and site-specific ecological risk-based screening levels where available.

5.5.1 Impact Analysis: Proposed Action

This alternative includes restoration of tidal wetlands and transitional habitats and re-use of excavated soils on-site. The implementation of the Proposed Action would include demarcation of mitigation limits, removal and disposal of nonnative vegetation, excavation and grading to restore tidal hydrology and drainage patterns, or reuse of excavation soils, decompaction, site preparation, and planting and seeding.

As determined in the Hazardous Material Assessment (Bodhi Group 2012), there was no evidence of hazardous materials, hazardous waste, or other environmental constraints that would preclude restoration to the D Street Fill. The lack of contaminants at the project site was further supported through the soils sample analysis report (Bodhi Group 2013), which concluded no hazardous materials are present on-site, based on multiple lines of evidence of no observations of contamination in the soil cores, no history of unauthorized chemical releases on-site, and chemical concentrations either below screening levels or representative of background conditions. Further, the soil at the site would not require special handling or additional health and safety measures for chemical exposures other than those normally exercised for construction projects in areas that do not have environmental contamination. No adverse effects of the proposed restoration associated with the proposed action related to contaminants are anticipated.

Mitigation Measures

The following conservation measure, which has been incorporated into the scope of the project, would be implemented in the unlikely event that contamination is encountered during excavation activities:

If soil is observed to be visibly stained, discolored, shiny, oily; has evidence of burn activities; has a noticeable solvent-like or hydrocarbon odor; or appears to be debris, further excavation at that location would cease and the area plus a 20-foot buffer would be cordoned off with caution tape or similar visible markers until the suspect material is further evaluated, sampled, and analyzed. Work can proceed in other areas if it is determined that no potential exists for exposure to construction workers or the risk is able to be reduced to a safe level.

No other measures related to contaminants are required for Alternative B.

5.5.2 Impact Analysis: No Action (Alternative A)

This alternative assumes the restoration project is not implemented and there is no change from existing management programs. This alternative serves as the baseline to which all other action alternatives are compared. There would be no major changes in habitat management under this alternative and no adverse effects related to contaminants would result.

5.5.3 Impact Analysis: Alternative C

Alternative C differs from Alternative B only in manner in which the material excavated from the restoration site is handled. Under Alternative C, the excavated material would be disposed of offsite

Mitigation Measures

All mitigation measures are identical to Alternative B as described above and are not repeated here.

5.6 <u>Greenhouse Gas Emissions</u>

Thresholds of Significance

The Service has not developed a quantitative threshold for determining whether a project's GHG emissions would have a significant effect on the environment. Therefore, the determination of whether the level of GHG emissions associated with the proposed project would have a significant effect on the environment involved consideration of the following factors: the extent to which the project would increase or decrease GHG emissions; and whether the project complies with applicable regulations, plans, or policies for reducing GHG emissions.

The CEQ guidance explains that agencies should consider both the estimated GHG emissions and the implications of climate change for the environmental effects of a proposed action. The NEPA analysis is based on the CEQ guidance. If the project exceeds 25,000 MT CO_2e per year, the project would have a significant effect on the environment.

5.6.1 Impact Analysis: Proposed Action

Construction-related exhaust emissions for the proposed project were estimated for construction worker commutes, haul trucks, and the use of off-road equipment. As discussed in Section 5.2, Air Quality, construction-related emissions associated with typical construction activities were modeled using CalEEMod. Operation of the proposed action is not anticipated to generate new vehicle trips and would not generate any additional activities related to maintenance or operations that would exceed existing levels. Therefore, operational GHG emissions were not estimated for the proposed action.

The annual GHG emissions for the proposed action would be approximately 584 MT CO_2e per year. The total GHG emissions would not exceed the CEQ threshold of 25,000 MT CO_2e per year. Therefore, the proposed action would not result in a substantial adverse effect related to the generation of GHG emissions, either directly or indirectly, that may have a significant effect on the environment.

The 2014 CEQ guidance also states that agencies should consider the implications of climate change for the environmental effects of a proposed action. Climate change can affect the environment of a proposed action in a variety of ways. Climate change can increase the vulnerability of a resource, ecosystem, human community, or structure, which would then be more susceptible to climate change and other effects and result in a proposed action's effects being more environmentally damaging.

The Service has developed a Climate Change Strategic Plan, which establishes a basic framework within which the agency would work as part of the larger conservation community to help ensure the sustainability of fish, wildlife, plants, and habitats in the face of accelerating climate change (USFWS 2010). The Service Strategic Plan uses three key strategies to address climate change, which are adaptation, mitigation, and engagement. Adaptation is planned, science-based management actions to help reduce the impacts of climate change on fish, wildlife, and their habitats. Mitigation involves reducing the "carbon footprint" of the agency by using less energy, consuming fewer materials, and appropriately altering land management practices. Engagement involves reaching out to key constituencies and stakeholders to seek solutions to the challenges to fish and wildlife conservation posed by climate change.

The Service Strategic Plan contains numerous goals and objectives to meet these strategies. The most relevant goals and objectives are related to mitigation of climate change impacts:

- Goal 2. We would develop long-term capacity for biological planning and conservation design and apply it to drive conservation at broad, landscape scales.
    - Objective 2.4: Incorporate Climate Change in Service Activities and Decisions.
- Goal 3. We would plan and deliver landscape conservation actions that support climate change adaptations by fish and wildlife of ecological and societal significance.
    - Objective 3.5: Conserve Coastal and Marine Resources
- Goal 5. We would change our business practices to achieve carbon neutrality by the Year 2020.
- Goal 6. To conserve and restore fish and wildlife habitats at landscape scales while simultaneously sequestering atmospheric greenhouse gases, we would build our capacity to understand, apply, and share biological carbon sequestration science; and we would work with partners to implement carbon sequestration projects in strategic locations.

Tidal marshes accumulate and store carbon in their plant matter, roots, and soils and are recognized for their role in carbon sequestration and carbon storage. Unlike other carbon-dense ecosystems, tidal wetlands sequester carbon at dramatically large rates due to high primary productivity, continuous sediment burial, and low organic matter decomposition (Chmura et al. 2003). According to Coverdale et al. 2014 “if preserved, salt marshes are a sustainable solution to curtailing increasing atmospheric carbon.” The proposed action would restore a portion of the D Street Fill to intertidal wetlands consistent with the recommendations presented in the San Diego Bay NWR CCP. The purpose of the proposed action is also consistent with the goals and objectives in the Service Climate Change Strategic Plan.

ARB’s Scoping Plan update includes measures and strategies established to meet California’s goal of reducing emissions to 1990 levels by 2020 and also reiterates the state’s role in the long-term goal established in Executive Order S-3-05, which is to reduce GHG emissions to 80% below 1990 levels by 2050. The Scoping Plan update did not directly create any regulatory requirements for the proposed action. ARB’s Scoping Plan update includes a summary of actions completed to date that would address the AB 32 goals for 2020. In addition, the Scoping Plan update includes recommended actions that would indirectly address GHG emissions from construction activities, such as providing expanded markets for clean passenger transportation, advanced technology trucks and equipment, low-carbon transportation fuels and energy, and related infrastructure. The proposed action would be required to comply with applicable

regulations, including those developed as measures in the ARB Scoping Plan. The proposed action is also consistent with the goals of the Scoping Plan update to look at natural lands in a more holistic and integrated way to ensure the health and resiliency of these lands to provide ongoing ecosystem services (ARB 2014a).

The purpose of the proposed action is consistent with the goals of the Service Climate Change Strategic Plan at the Federal level and the Scoping Plan update at the State level. Therefore, the proposed action would not result in a substantial adverse effect related to a conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

Mitigation Measures

No mitigation measures are recommended for the proposed action.

5.6.2 Impact Analysis: No Action (Alternative A)

This alternative assumes the restoration project is not implemented and there is no change from existing management programs. This alternative serves as the baseline to which all other action alternatives are compared. There would be no major changes in habitat management under this alternative. Since no increase in activities would occur under Alternative A, GHG emissions would also not increase. Alternative A would not result in a substantial adverse effect related to the generation of GHG emissions, either directly or indirectly, that may have a significant effect on the environment. Alternative A would not result in a substantial adverse effect related to a conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

5.6.3 Impact Analysis for Alternative C

The annual GHG emissions for Alternative C were estimated at 1,006 MT CO_2e per year. Similar to the proposed action, construction-related GHG emissions for Alternative C would not exceed the CEQ threshold of 25,000 MT CO_2e per year. Alternative C would be consistent with the goals of the Service Strategic Plan and the ARB Scoping Plan update. Therefore, Alternative C would not result in a substantial adverse effect related to a conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs. Alternative C would not result in a substantial adverse effect related to a conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

Mitigation Measures

No mitigation measures are recommended for Alternative C.

5.7 Sea Level Rise

Thresholds of Significance

The potential significance of sea level rise impacts related to the proposed action has been assessed based on context and the intensity of the effects. The following discussion discloses how the proposed alternatives may affect or may be affected by sea level rise. This analysis is consistent with the guidance provided in the CCC *guidance* (CCC 2013).

5.7.1 Impact Analysis: Proposed Action

The CCC guidance indicates that impacts from sea level rise should be determined by the range of characteristics of each resource, including exposure (whether sea level rise would affect the resource), sensitivity (to what degree), adaptive capacity (how well the resource can accommodate changes in sea level), and consequences (e.g., economic, ecological).

As shown in Exhibit 4.7-2, the project area is not anticipated to be affected by sea level rise by 2050. However, as shown in Exhibit 4.7-3, a 5-foot (60-inch) increase in sea level rise would be projected to inundate the southern portion of the project site by 2100. The project site would be dependent on local physical parameters such as water flow, tidal fluctuation, sediment supply, and water quality. Sea level rise could result in changes to tidal dynamics, including changes to the tidal range.

The overall goal of proposed action is to restore 12.44 acres of primarily disturbed habitat on the D Street Fill to 11.03 acres of tidally influenced wetland habitats and 1.41 acres of upland transition habitat. A variety of wetland and transitional habitats are proposed for restoration, although the primary habitats to be restored are southern coastal salt marsh. A more natural edge would be created along the shoreline through the removal of the steep slope and creation of an open water area that gradually transitions to mud flat and low marsh.

The project site was originally mudflat and salt marsh habitat, with salt marsh formerly occurring in the majority of the area (Grossinger et al. 2011). As discussed in Section 5.10, Hydrology, the excavation and grading activities involved with the proposed action have the potential to alter the fluvial and tidal hydrology of the area to near historical conditions. Subtidal channels, mudflat, and low salt marsh would be restored, and the slightly higher elevations would allow the area to

inundate during moderate to high tides for the development of mid- to high-salt marsh vegetation.

The D Street Fill surface elevations range from 2 to 12 feet above MSL. Natural barriers would be removed through grading and contouring of the land to ensure that the project area adapts and functions at normal levels. However, with possible sea level rise at the project site, mudflat and low marsh could transition to subtidal habitat, and mid-high marsh could transition to mudflat and low marsh (AECOM 2014). The proposed action would provide maximum diversity and productivity in the short term. In the long term, some marsh habitats may be lost, with the system dominated by subtidal habitat and mudflat. However, the projections of sea level rise in this area have a high degree of uncertainty (NOAA 2015). Therefore, long-term changes in habitat as a result of sea level rise would require regular monitoring to determine impacts after 2050.

In addition to the changes in habitat and hydrology at the project site as a result of the proposed action, the excavated material would be used as fill to raise by approximately 8 feet the elevation of a 29.85-acre area of the D Street Fill. The increased elevation would provide a buffer to sea level rise and enhance the ability of the area to adapt to changes over time. As shown in Section 4.7, NOAA has developed maps that indicate areas around San Diego that would be affected by various ranges of sea level rise. Exhibit 4.7-2 shows the project area with a 2-foot (24-inch) sea level rise that could occur by 2050 and Exhibit 4.7-3 shows the project area with a 5-foot (60-inch) sea level rise that could occur by 2100. The shades of blue (darker blue = greater depth) represent areas that are hydrologically connected and would be inundated at high tide.

The proposed action would restore habitats and improve tidal hydrology and drainage patterns over existing conditions. In addition to the improved hydrology as a result of the proposed action, maintaining healthy tidal wetlands protects shorelines from flood and erosion by absorbing waves and slowing the flow of the high water mark. Overall, the proposed action would improve the ability of the project area to respond to long-term climate effects, such as increased sea level rise and would not result in any adverse effects associated with sea level rise.

5.7.2 Impact Analysis: No Action (Alternative A)

The project area would be subject to the impacts of climate change regardless of the alternative implemented. Under the No Action Alternative, the site would continue to be managed by the Refuge and remain designated for restoration to intertidal habitat. The 12.44 acres of restoration on the D Street Fill would not be implemented. As indicated in Exhibit 4.7-2, sea level rise would inundate additional areas in San Diego, including the southern portion of the project site, by 2100.

5.7.3 Impact Analysis: Alternative C

Under Alternative C, soils excavated during construction of the tidal wetland on the D Street Fill would be trucked off-site and would not be used to raise the elevation of a 29.85-acre area of the D Street Fill. However, similar to the proposed action, Alternative C would restore primarily disturbed habitat to tidally influenced wetland habitats and upland transition habitat. Alternative C would improve the ability of the project area to respond to long-term climate effects, such as increased sea level rise and would not result in any adverse effects associated with sea level rise.

5.8 Environmental Justice

This section evaluates the potential for adverse human health or environmental effects to minority populations or low-income populations living in the vicinity of the D Street Fill as a result of implementing the various actions proposed in each alternative.

Threshold of Significance

Impacts related to environmental justice would be considered significant if a proposed action would result in disproportionate adverse human health impacts or environmental effects to low-income or minority populations.

5.8.1 Impact Analysis: Proposed Action

This alternative includes restoration of tidal wetlands and transitional habitats and re-use of excavated soils on-site. The implementation of the proposed action would include demarcation of mitigation limits, removal and disposal of nonnative vegetation, excavation and grading to restore tidal hydrology and drainage patterns, or reuse of excavation soils, decompaction, site preparation, and planting and seeding. The mobilization and demobilization activities, including equipment transport, would occur west of I-5, parallel to the Bayshore Bikeway. These vehicular trips would be of limited duration and restricted to the fewest vehicles necessary to deliver the required equipment. No adverse effects of the proposed restoration associated with Alternative B related to environmental justice are anticipated.

Mitigation Measures

No mitigation measures are recommended for the proposed action.

5.8.2 Impact Analysis: No Action (Alternative A)

This alternative assumes the restoration project is not implemented and there is no change from existing management programs. This alternative serves as the baseline to which all other action alternatives are compared. There would be no major changes in habitat management under this alternative and no adverse human health or environmental effects to minority or low-income populations would result.

5.8.3 Impact Analysis: Alternative C

This alternative includes restoration of tidal wetlands and transitional habitats and disposal of excavated soils off-site at the Otay Landfill. The implementation of Alternative C would be the same as the proposed action, including demarcation of mitigation limits, removal and disposal of nonnative vegetation, excavation and grading to restore tidal hydrology and drainage patterns, disposal or reuse of excavation soils, decompaction, site preparation, and planting and seeding. The mobilization and demobilization activities would also mirror the proposed action and would occur west of I-5, via the Bayshore Bikeway. These vehicular trips would be of limited duration and restricted to the fewest vehicles necessary to deliver the required equipment.

Approximately 120 truck trips per day would be required to dispose of the excavated soils off-site. These trips would travel along I-5 and various collector streets to access the Otay Landfill, are regularly used by waste hauling vehicles, and would not traverse residential streets. No adverse effects of the proposed restoration associated with Alternative C related to environmental justice are anticipated.

Mitigation Measure

No mitigation measures are recommended for Alternative C.

5.9 <u>Geology and Soils</u>

Thresholds of Significance

Effects on geology and soils would be considered significant if project-related actions would trigger or accelerate substantial slope instability, subsidence, ground failure, or erosion affecting on-site facilities or adjacent facilities, such as roadway and railway embankments and bridge abutments and pilings.

5.9.1 Impact Analysis: Proposed Action

This alternative includes restoration of 12.44 acres of disturbed habitat to tidal wetlands and transitional habitats, and re-use of excavated soils on-site within the designated 29.85 acres adjacent to the restoration area. The implementation of the proposed action would include demarcation of mitigation limits, removal and disposal of nonnative vegetation, excavation of approximately 125,000 cubic yards of soil (material) and grading to restore tidal hydrology and drainage patterns, or reuse of excavation soils, decompaction, site preparation, and planting and seeding.

Earthwork associated with this alternative includes soil excavation, grading to prepare the restoration site for salt marsh mitigation installation, and removal of fill material. Proposed grading would improve physical and hydrological conditions for the establishment of salt marsh habitat. Grading would improve drainage patterns, increase areas appropriate for salt marsh habitat creation, and establish primary tidal flow and low-flow channels within the restoration site. As the proposed site consists of 4 to 8 feet of fill material, substantial grading would be required to restore tidal flushing and subtidal and intertidal mudflat and salt marsh habitat areas. Less grading would be needed to transition from wetland to upland habitat areas.

Subtidal habitat would be excavated to below +0.75 feet MLLW and would slope gradually (4% to 5%) to mudflat (+0.5 to +3 feet MLLW), which would slope gradually (17% to 22%) to low marsh (+3 to +5.3 feet MLLW). Once the low marsh reaches an elevation of approximately +4 feet MLLW, the marsh plain would remain mostly flat until transitioning to +5.3 feet and above into high marsh. Transition zone slopes would be relatively abrupt, ranging from 3:1 to 4:1 slopes, to maximize wetland acreage.

Material re-use would occur on-site and the excavated material would be trucked on unpaved access roads within the D Street Fill. Placement of the excavated soil would raise by approximately 88 feet the elevation of a 29.85-acre area of the D Street Fill currently managed as a California least tern nesting area. The coarse sand and shells that currently cover the nesting area would be scraped and stockpiled prior to on-site material re-use. Stockpiled soils would be protected with appropriate BMPs (e.g., silt fences, straw wattles) until such time as they are placed on top of the excavated sediment.

When restoration earthwork is complete, the stockpiled coarse sand and shell material would be replaced at the original thickness. The resulting configuration would be a flat pad approximately 8 feet higher than existing ground, with 20:1 slopes on all sides. The fill area was designed to provide a flat nesting site for least terns with a clear line of sight to any potential predators, which is a nesting site selection criterion. The 20:1 slopes of the new nesting area were designed

to provide an appropriate slope for western snowy plover chicks, should this species choose to nest on-site. The Restoration Ecologist would oversee and guide the final grades and placement of stockpiled soil.

The re-use of material on the least tern nesting site would provide a means of drying wet soils. Wet soils would be spread and allowed to dry before additional material is placed on top.

The success of wetland restoration depends greatly on the accuracy of the final grading in achieving the desired elevations for different wetland habitats. Grades would be checked frequently by the Project Engineer and the contractor must keep detailed records for inspection. The Restoration Ecologist would closely observe all grading, review grade checks, and provide recommendations as necessary for successful implementation.

No unique geologic features occur within this Sweetwater Marsh Unit and no active faults have been identified in the immediate area. The site would, however, be subject to seismic ground shaking or seismically induced liquefaction in the event of a large magnitude earthquake on one of the faults in the San Diego region. Under this alternative, no structures are proposed; therefore, hazards and the potential for structural damage due to seismic ground shaking or seismically induced liquefaction in the event of an earthquake would remain unchanged and considered low (USFWS 2006). Implementation of this alternative would not adversely affect the soil on-site but would be beneficial by removing fill material and restoring the site back to subtidal channel and salt marsh conditions for different coastal and upland habitats.

Mitigation Measures

No mitigation measures are recommended for the proposed action.

5.9.2 Impact Analysis: No Action (Alternative A)

This alternative assumes the restoration project is not implemented and there is no change from existing management programs. This alternative serves as the baseline to which all other action alternatives are compared. There would be no major changes in habitat management under this alternative. No adverse effects related to geology or soils would result from this alternative.

5.9.3 Impact Analysis for Alternative C

Alternative C differs from Alternative B only in the disposal of excavated material. All other restoration methods are identical to Alternative B as described above and are not repeated here. With Alternative C, soils excavated during construction of the tidal wetland on the D Street Fill

would be trucked off-site to a not yet determined site. For the purposes of this EA, it is assumed that the approximately 125,000 cubic yards of excavated material would be disposed at the Otay Landfill in Chula Vista. This landfill has indicated the willingness to accept clean fill as daily cover. The availability of this landfill during the construction of the D Street Fill wetland would need to be verified at the time of construction, should this alternative be selected as the preferred alternative. The Otay Landfill is located approximately 12 miles from the D Street Fill resulting in an approximately 24-mile round trip. Access from the D Street Fill would be north and west parallel to the Bayshore Bikeway; north on Marina Way to Marina Boulevard/East 24th Street; south on I-5 to SR 54 east; south on I-805 to Main Street; and east on Main Street to Maxwell Road north.

No unique geologic features occur within this Sweetwater Marsh Unit and no active faults have been identified in the immediate area. The site would, however, be subject to seismic ground shaking or seismically induced liquefaction in the event of a large magnitude earthquake on one of the faults in the San Diego region. Under this alternative, no structures are proposed; therefore, hazards and the potential for structural damage due to seismic ground shaking or seismically induced liquefaction in the event of an earthquake would remain unchanged and considered low (USFWS 2006). Implementation of this alternative would not adversely affect the soil on-site but would be beneficial by removing fill material and restoring the site back to subtidal channel and salt marsh conditions for different coastal and upland habitats.

Mitigation Measures

No mitigation measures are recommended for Alternative C.

5.10 Hydrology

Thresholds of Significance

The proposed project would have a significant adverse hydrologic effect if the action would result in the following:

a. Alter currently projected 100-year flood elevations upstream or downstream of the project site;

b. Substantially alter flood flow velocities and associated erosional forces;

c. Create changes in tidal circulation that would trigger or accelerate slope instability or erosion affecting on-site facilities or adjacent facilities, such as roadways, railway embankments, and culverts.

d. Jeopardize the stability of or increase the maintenance requirements for existing or proposed tidal channels, levee breaches, adjacent levees, or other facilities.

5.10.1 Impact Analysis: Proposed Action

This alternative aims to restore San Diego Bay to its historical habitat that consisted of mudflat and salt marsh habitat. To restore the site to its historical state, Alternative B proposes earthwork activities, which include soil excavation, grading to prepare the restoration site for salt marsh mitigation installation, and removal of fill material. Specifically, Alternative B proposes to excavate a portion of existing fill located within the proposed restoration site to provide for adequate tidal flushing, allowing for a diverse mix of intertidal habitats immediately following construction. Alternative B also proposes to layback the existing steep slope located along the shoreline of the square-shaped subtidal embayment to create a more natural edge and an open water area that gradually transitions to mudflat and low marsh.

Elevations at the proposed restoration site currently range from -0.72 feet MLLW at the southern edge of the site and up to 9.28 feet MLLW at the northern edge of the site, based on 1999 topographic data obtain from SanGIS. Based on the latest tidal data acquired for San Diego Bay (Control Tide Station: 9410170 San Diego Bay), the highest observed water level was 8.14 feet above MLLW on January 27, 1983. The mean tide level was 2.96 feet above MLLW, and the lowest observed water level was -3.09 feet above MLLW on December 17, 1937 (NOAA 2011). Above the berm, the site is relatively flat. Due to the existing steep berm and height of fill, the restoration site is currently above the elevation of tidal inundation, with the exception of a narrow margin along the southern boundary.

Implementation of Alternative B would result in the excavation of approximately 125,000 cubic yards of sediment at various elevations across the restoration site. Subtidal channels would be restored by excavating to elevations less than 0.75 feet MLLW, mudflat would be restored by excavating to between 0.75 and 3.0 feet MLLW, and low salt marsh would be restored by excavating to a range of 3.0 to 5.3 MLLW and slightly higher elevations to allow the area to inundate during moderate to high tides for the development of mid to high salt marsh vegetation. As such, depth of excavation across the site would generally range from 8 feet, with the deepest excavation occurring for the subtidal channels.

By removing the existing fill impediment to tidal hydrology, the historic tidal channel areas in the area would be recreated in a configuration similar to the historic condition.

Re-use of excavated material would occur on-site. The excavated material would be trucked on unpaved access roads within the D Street Fill. The excavated soil would be used as fill to raise,

by approximately 8 feet, the elevation of a 29.85-acre area within a currently managed California least tern nesting area. The resulting configuration would be a flat pad approximately 8 feet higher than existing ground, with 20:1 slopes on all sides.

The excavation and grading activities proposed by Alternative B have the potential to alter the fluvial and tidal hydrology of the area to near historical conditions.

Mitigation Measures

Alternative B would have only beneficial impacts to hydrology. Tidal inundation is essential to the coastal wetland habitats supported on the Refuge and restored in Alternative B. No mitigation measures are proposed.

5.10.2 Impact Analysis: No Action (Alternative A)

This alternative assumes the restoration project is not implemented and there is no change from existing management programs. This alternative serves as the baseline to which all other action alternatives are compared. There would be no major changes in habitat management under this alternative. No adverse effects related to hydrology would result from this alternative.

5.10.3 Impact Analysis: Alternative C

Alternative C differs from Alternative B only in the disposal of excavated material. All other restoration methods are identical to Alternative B as described above and are not repeated here. For the purposes of this EA, it is assumed that the approximately 125,000 cubic yards of excavated material would be disposed at the Otay Landfill in Chula Vista and would not be disposed on-site.

Mitigation Measures

Alternative C would have the only beneficial impacts to hydrology. Tidal inundation is essential to the coastal wetland habitats supported on the Refuge and is restored in Alternative C. As a result of the beneficial tidal impacts of Alternative C, no mitigation measures are proposed.

5.11 Water Quality

Thresholds of Significance

Actions reasonably expected to result in violations of water quality standards or waste discharge requirements, substantial increase of downstream sedimentation, or the introduction of contaminants (non-point source pollution) into the watershed would result in a significant adverse effect to water quality. Substantial changes in groundwater or surface water quality as a result of the project would also be considered significant.

5.11.1 Impact Analysis: Proposed Action

The excavation of the fill material implemented by Alternative B could result in a temporary increase in turbidity within the tidal channels and the addition of sediments into the channels and surrounding areas during excavation. Short-term adverse impacts to water quality would be minimized by leaving an earthen berm in place along the southern construction site perimeter to block tidal inundation during excavation activities. The berm would be removed once all work is complete. Removal of the berm would occur during an incoming high tide to allow loose sediment to travel and be deposited north into the site.

The proposed action would be subject to the Construction General Permit Adopted Order 2009-0009-DWQ (As amended by 2010-0014-DWQ and 2012-006 DWQ) and would be required to adhere to the corresponding BMPs related to the SWPPP. A new Construction General Permit is anticipated to be released this year. At the time NOI is submitted the project will comply with the appropriate permit. BMPs would be implemented to minimize the potential for sedimentation and contamination from construction activities into adjacent channels, as well as minimize adverse impacts when the tidal wall is removed. BMPs would include silt fences, certified weed free fiber rolls, and/or straw wattles and would be repaired or replaced by the construction contractor if damaged or destroyed. Excavated and stockpiled materials would be protected with appropriate BMPs (silt fences, straw wattles, etc.) until the materials are placed on top of the excavated sediment. Construction staging and access routes would be located in stable upland areas; silt fences would be installed around construction areas in accordance with the SWPPP; and, if necessary, cofferdams would be used to minimize erosion and sedimentation into the adjacent marsh. Control of possible contaminants related to construction activities would be accomplished through the use of spill control BMPs including, but not limited to, the following actions: fueling vehicles and machinery in a designated location at an appropriate distance from wetlands; immediately stopping, containing, cleaning, and properly disposing of spills; having spill kits available onsite from mobilization to demobilization, and training field personnel on spill prevention and cleanup. The implementation of these measures would reduce the potential

for increased sedimentation and the exposure to contaminants related to construction activity to below a level of significance.

Mitigation Measures

SWPPP implementation and use of appropriate BMPs on-site would reduce the level of impacts to below a level of significance.

5.11.2 Impact Analysis: No Action (Alternative A)

This alternative assumes the restoration project is not implemented and there is no change from existing management programs. This alternative serves as the baseline to which all other action alternatives are compared. There would be no major changes in habitat management under this alternative. No adverse effects related to water quality would result from this alternative.

5.11.3 Impact Analysis: Alternative C

Alternative C differs from Alternative B only in the disposal of excavated material. All other restoration methods are identical to Alternative B as described above and are not repeated here. For the purposes of this EA, it is assumed that the approximately 125,000 cubic yards of excavated material would be disposed at the Otay Landfill in Chula Vista and would not be disposed of on-site.

Mitigation Measures

Implementation of BMPs, as described under Alternative B, as well as additional BMPs related to minimizing the tracking of dirt onto public roadways, would reduce the level of impacts to below a level of significance.

5.12 Noise

This section evaluates the potential noise impacts on human and/or noise-sensitive receptors in the vicinity of the D Street Fill as a result of implementing the various actions proposed in each of the following alternatives.

Threshold of Significance

An action that generates noise levels that violate Federal, State, regional, or local noise standards or requirements would be considered a significant adverse effect.

5.12.1 Impact Analysis: Proposed Action

Under Alternative B, construction activities generating noise levels would include:

- Equipment mobilization, demobilization, and access, and staging areas
- Clearing and grubbing existing vegetation
- Earthwork within the proposed action footprint to lower elevations
- Re-use of soils
- Planting of salt marsh and transitional habitats

The mobilization and demobilization activities, including equipment transport, would occur adjacent to the Bayshore Bikeway. Estimated equipment needed for construction, as shown in Table 3, includes two bulldozers, two excavators, four dump trucks, and one water truck, which would arrive by transport truck and enter the site through an approved access route (Figure 1).

Staging areas would be located in disturbed areas on the D Street Fill. Prior to the start of grading, the restoration site would be cleared and grubbed, and materials would be transported off-site for disposal.

Earthwork is the major construction activity of the proposed action, which includes soil excavation of approximately 125,000 cubic yards of soil (material) and grading of the site for marsh installation and the removal of fill material. The earthwork excavation would be accomplished using primarily excavators and a bulldozer. Excavated material would be loaded into four dump trucks and trucked on unpaved access roads for placement within the D Street Fill. A maximum of 120 truck trips per day would be generated. At the end of construction, all equipment would be demobilized, using the same route as mobilization.

Noise associated with the proposed action would be generated by the operation of the construction equipment, primarily during earthmoving and truck hauling. Construction noise levels are a function of the number and type of equipment used and the timing and duration of their noise-generating activities. Table 14 provides the noise levels generated by types of equipment for the proposed construction.

As shown in Table 14, maximum noise levels from the project construction equipment range from approximately 80 to 85 dBA at 50 feet from the equipment, which would be average noise levels of approximately 80 dBA L_{eq} at 50 feet. The construction noise would occur 4 to 5 months; however, this activity would occur in the daytime and approximately 1,000 feet from the nearest dwelling unit, therefore, residences in proximity would be unaffected by noise generated at the project site.

Table 14
Construction Equipment Noise Levels

Equipment	Maximum Noise Level (dBA) 50 Feet from Source
Dozer	85
Dump Truck	84
Excavator	85
Flat Bed Truck	84
Front-End Loader	80

dBA = ampere-weighted decibels
Source: FHWA 2006

Ambient noise levels at the site would increase during construction activity; however, the increase would be temporary and not in proximity to residences, and therefore considered less than significant. To avoid indirect noise impacts to sensitive wildlife species during the bird breeding season, all grading of the restoration project that occurs on D Street Fill would be conducted outside of the breeding season (i.e., between September 30 and February 15). No adverse effects of the proposed restoration associated with Alternative B related to noise are anticipated.

Mitigation Measures

No mitigation measures are recommended for the proposed action.

5.12.2 Impact Analysis: No Action (Alternative A)

This alternative assumes the restoration project is not implemented and there is no change from existing management programs. This alternative serves as the baseline to which all other action alternatives are compared. There would be no major changes in habitat management under this alternative. No adverse effects related to noise would result from this alternative.

5.12.3 Impact Analysis: Alternative C

Implementation of Alternative C would be the same as Alternative B (proposed action), except the excavated material (approximately 125,000 cubic yards of soil) would be trucked off-site for disposal, assumed for this analysis to be the Otay Landfill in the City of Chula Vista, approximately 12 miles from the D Street Fill. The same maximum of 120 truck trips per day would be generated. The truck route from the D Street Fill would be north and west along the

Bayshore Bikeway; north on Marina Way to Marina Boulevard/East 24th Street; south on I-5 to SR 54 east; south on I-805 to Main Street; east on Main Street; and north on Maxwell Road to the landfill. To access the Otay Landfill, the off-site the truck haul trips would traverse interstate and major arterials regularly used by other waste hauling vehicles accessing the landfill, and would not traverse residential streets.

No adverse effects of the proposed restoration associated with Alternative C related to noise are anticipated.

Mitigation Measures

No mitigation measures are recommended for Alternative C.

5.13 Traffic

This section evaluates the potential traffic impacts on the roadways accessing the D Street Fill during the transport of construction equipment and the truck hauling of excavated fill material, as a result of implementing the various actions proposed in each of the following alternatives.

Threshold of Significance

An action that generates traffic conditions that violate Federal, State, regional, or local traffic standards or requirements would be considered a significant adverse effect.

5.13.1 Impact Analysis: Proposed Action

The proposed action would generate traffic volumes on area roadways during the delivery and removal of construction equipment (i.e., earthmoving equipment) and construction worker commute. Excavated soil material would be transported by truck on-site to a dedicated placement on-site. A maximum of 120 truck trips per day would be generated for the truck hauling of excavated material, however, the trips would remain on-site.

During project mobilization and demobilization activities, nine pieces of construction equipment would be transported by truck to the project site via the approved access route from I-5 on Bay Marina Drive/East 24th Street, Marina Way, and parallel to the Bayshore Bikeway to the project site (Figure 1). Project construction workers (approximately 12 workers) would provide approximately 24 daily trips along this same route from I-5. As shown in Table 10 (WP -NEW), available traffic volumes on these roadways are substantially greater (e.g., 9,400 ADT on Bay Marina Drive/East 24th Street); therefore, project traffic would be a minimal, short-term addition

to the existing traffic volumes of the roadways of the approved route, and therefore would not have an adverse effect on roadway traffic volumes. No significant adverse traffic impact would occur under the proposed action.

Mitigation Measures

No mitigation measures are required for the proposed action.

5.13.2 Impact Analysis: No Action (Alternative A)

This alternative assumes the restoration project is not implemented and there is no change from existing management programs. This alternative serves as the baseline to which all other action alternatives are compared. There would be no major changes in habitat management or the current public use program under this alternative. No adverse effects related to traffic would result from this alternative.

5.13.3 Impact Analysis: Alternative C

Implementation of Alternative C would generate the same vehicle trips as Alternative B (proposed action), except instead of placement on-site, the excavated material would be trucked off-site for disposal to the Otay Landfill, approximately 12 miles from the D Street Fill via the same mobilization route (i.e., I-5, Marina Way, Bay Marina Drive/East 24th Street), and then I-5 north to SR 54 east, I-805 south, Main Street east, and Maxwell Road north to the Otay landfill (Figure 7). The same maximum of 120 truck trips per day would be generated for the truck hauling of excavated material, which would be a minimal short-term addition to the existing traffic volumes of the roadways of the off-site hauling route (i.e., 3,800 to 165,000 ADT), as shown in Table 10 (WP-NEW) and, therefore, would not have an adverse effect on roadway traffic volumes. No significant adverse traffic impacts would occur under Alternative C.

Mitigation Measures

No mitigation measures are recommended for the Alternative C.

5.14 <u>Public Access and Recreational Opportunities</u>

5.14.1 Impact Analysis: Proposed Action

The only potential affect to public access and recreational opportunities under Alternative B (proposed action) would be the temporary movement of construction equipment across the

Bayshore Bikeway at one location as illustrated in Figure 1. To minimize the potential for adverse impacts to recreational users, a flagman would be present when construction equipment is crossing the path or during commute hours when construction workers are crossing the bikeway while traveling to or from the construction site. Vehicular travel would be restricted to the fewest vehicles necessary to deliver the required equipment. All deliveries would be coordinated with the Construction Manager prior to their arrival. All access routes and staging areas would be reviewed by the Construction Manager and Refuge Manager prior to the start of mobilization to ensure that no adverse effects to users along the Bayshore Bikeway would occur.

Mitigation Measures

Under this alternative, potential short-term impacts to the Bayshore Bikeway would be minimized by posting a flagman at either end of the initial east-west portion of the Bayshore Bikeway with another posted at the north-south access crossing of the bikeway during movement of construction equipment to protect bicyclists and pedestrians. A flagman would also be present where the construction access route crosses the bikeway during commute hours when construction workers are traveling to or from the construction site. . With the implementation of this measure, this alternative would not have adverse effects related to public access and recreational opportunities and no further mitigation would be required.

Effects to public access would be considered significant if substantial modification to existing public recreation activities or opportunities would occur as a result of the proposed action or if existing public access would be substantially altered.

5.14.2 Impact Analysis: No Action (Alternative A)

This alternative assumes the restoration project is not implemented and there is no change from existing management programs. This alternative serves as the baseline to which all other action alternatives are compared. There would be no major changes in the manner in which this portion of the Refuge is managed under this alternative. No delays to the Bayshore Bikeway would occur and the D Street Fill would continue to be closed to all public access.

5.14.3 Impact Analysis: Alternative C

Alternative C differs from Alternative B in the disposal of excavated material and the number of vehicle trips required to export the excavated material. All other restoration methods are identical to Alternative B as described above and are not repeated here. Under Alternative C, soil excavated from the project site would be trucked off-site to a not yet determined location. For the purposes of this EA, it is assumed that the approximately 125,000 cubic yards of excavated

material would be disposed at the Otay Landfill in Chula Vista. Access from the D Street Fill would be north and west parallel to the Bayshore Bikeway; north on Marina Way to Marina Boulevard/East 24th Street; south on I-5 to SR 54 east; south on I-805 to Main Street; and east on Main Street to Maxwell Road north. Like Alternative B, a flagman would be posted at either end of the initial east-west portion of the Bayshore Bikeway with another posted at the north-south crossing of the bikeway during movement of heavy equipment to protect bicyclists and pedestrians.

Under this alternative, more vehicle trips would be required to export materials off-site than under the proposed action. More intermittent delays to the Bayshore Bikeway would occur during construction but would be temporary and minimized with the use of flagmen during movement of heavy equipment. With the requirement to use flagmen where users of the Bayshore Bikeway could be affected, this alternative would not have adverse effects related to public access and recreational opportunities and no further mitigation would be required.

Mitigation Measures

Mitigation to minimize the potential for conflicts between construction activities and users of the Bayshore Bikeway would be the same as described under Alternative B.

6.0 CUMULATIVE EFFECTS

The proposed project would not result in any impacts to air quality, cultural resources, contaminants, GHGs, sea level rise, environmental justice, geology and soils, hydrology, water quality, noise, traffic and public access and recreation. 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, Alternative B and Alternative C would result in less-than-significant direct impacts on biological resources 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.

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

6.1 Biological Resources

6.1.1 Proposed Action

The implementation of Alternative B would result in minor temporary impacts to biological resources, but would increase the overall acreage and quality of habitat for plants and wildlife resulting in a cumulative effect of a net gain of biological resources in the region. This alternative differs from Alternative C in that the on-site re-use of fill would increase the quality and availability of California least tern and western snowy plover habitat at the D Street Fill, where off-site disposal would not allow for that opportunity.

6.1.2 No Action (Alternative A)

The implementation of Alternative A, the No Action Alternative, would not change the current condition and would therefore have no cumulative effects to biological resources.

6.1.3 Alternative C

The implementation of Alternative C would have the same cumulative effects as Alternative B minus the potential nesting site benefits to California least tern and western snowy plover.

Based on the analysis of the above-listed topics, the proposed project would have potentially significant environmental effects on biological resources, cultural resources, GHG emissions, 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 would reduce project-related potentially significant impacts to a less-than-significant level. Therefore, after implementation of mitigation measures, the proposed project would result in a less-than-significant environmental impact on human beings.

7.0 IRRETRIEVABLE AND IRREVERSIBLE COMMITMENT OF RESOURCES

Implementation of the proposed action would require the commitment of nonrenewable resources, primarily petroleum products, to transport and apply soil to the site. All other aspects of the project are reversible, although to do so would require additional nonrenewable resources.

8.0 SHORT-TERM USE OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

Implementation of the proposed action would result in the short-term generation of GHG emissions and other air emissions, and the consumption of petroleum products. These short-term uses of the environment are intended to result in improved and long-term productivity of the Sweetwater Marsh Unit of the Refuge marsh habitat, which will result in a range of ecosystem services including carbon sequestration and carbon storage.

9.0 ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL OF ALTERNATIVES

The energy requirements for implementing the proposed project are limited in terms of total consumption and duration. Alternative C would result in somewhat greater energy requirements as the 125,000 cubic yards of soil that would be placed on the Refuge under the proposed action would have to be disposed of offsite at the Otay landfill location.

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11.0 REFERENCES CITED

AECOM

2014 *SDG&E Substation Relocation Project. Final Wetland Restoration Plan for the D Street Fill Site*. November.

Allen, L. G.

1999 *Fisheries Inventory and Utilization of San Diego Bay, San Diego California*. (Final Report – Sampling Periods July 1994 – April 1999).

Bodhi Group

2012 *Hazardous Materials Assessment Southeast Portion Of The D Street Fill Chula Vista, California.* Prepared for Ms. Angie Harbin-Ireland (AECOM). February.

2013 *Report of Soil Sampling and Analysis, D Street Fill Habitat Restoration Project, Chula Vista, California*. Prepared for Mr. Dick Rol (AECOM). October.

Bowden-Renna, Cheryl

2010 *eTS 20129 IO 200390762 Cultural Resources Monitoring for Poles Z187438 and Z89351, and Anchor Guy for Vegetation Clearing – National City/Chula Vista Area of San Diego County, California*. Prepared for Sempra Utilities.

Brevik and Homburg, Chmura et al.

2004 and 2003 Blue Carbon Initiative. http://thebluecarboninitiative.org, accessed on 12/05/14, 20042003).

California Air Resources Board (ARB)

2005 *Air Quality and Land Use Handbook: A Community Health Perspective*. Available at http://www.arb.ca.gov/ch/landuse.htm. Accessed April 2015.

2008 *Climate Change Scoping Plan*. Available at www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm. Accessed April 2015.

2014a *First Update to the Climate Change Scoping Plan: Building on the Framework*. Pursuant to AB 32, the California Global Warming Solutions Act of 2006. Available at http://www.arb.ca.gov/cc/scopingplan/2013_update/first_update_climate_change_scoping_plan.pdf. Accessed April 2015.

2014b *California Greenhouse Gas Inventory for 2000–2012 by Category as Defined in the 2008 Scoping Plan*. Available at http://www.arb.ca.gov/cc/inventory/data/tables/ghg_inventory_scopingplan_00-12_2014-03-24.pdf. Accessed April 2015.

California Coastal Commission (CCC)

2013 *Draft Sea-Level Rise Policy Guidance. Public Review Draft*. Available at http://www.coastal.ca.gov/climate/slr/guidance/CCC_Draft_SLR_Guidance_PR_10142013.pdf. Accessed September 15, 2014.

California Department of Transportation (Caltrans)

1998 *Technical Noise Supplement, Traffic Noise Analysis Protocol*. October.

California Department of Water Resources (DWR)

2008 *Managing an Uncertain Future: Climate Change Adaptation Strategies for California's Water*. Available at http://www.water.ca.gov/climatechange/docs/ClimateChangeWhitePaper.pdf. Accessed April 2015.

California Natural Diversity Data Base (CNDDB)

2011 California Department of Fish and Game. Database Query. October.

California Natural Resources Agency (CNRA)

2009 *California Climate Adaptation Strategy*. Available at http://resources.ca.gov/docs/climate/Statewide_Adaptation_Strategy.pdf. Accessed April 2015.

Chadwick, D. B.

1997 Tidal Exchange at the Bay-Ocean Boundary. Ph.D. dissertation, University of California, San Diego.

City of Chula Vista

2003 *City of Chula Vista MSCP Subarea Plan*. February 2003.

Council on Environmental Quality (CEQ)

2014 *Revised Draft Guidance for Greenhouse Gas Emissions and Climate Change Impacts*. Available at https://www.whitehouse.gov/administration/eop/ceq/initiatives/nepa/ghg-guidance. Accessed April 2015.

County of San Diego

2003 *Otay Valley Regional Park Trail Guidelines San Diego, California*.

2011 *County of San Diego General Plan*. August 2011.

Frost, N.
2014 *California least tern breeding survey, 2013 season*. California Department of Fish and Wildlife, Wildlife Branch, Nongame Wildlife Program Report, 2014-06. Sacramento, CA.

Grossinger, R. M., E. D. Stein, K. N. Cayce, R. A. Askevold, S. Dark, and A. A. Whipple
2011 *Historical Wetlands of the Southern California Coast: An Atlas of U.S. Coast Survey T-Sheets, 1851–1889*. San Francisco Estuary Institute Contribution #586 and Southern California Coastal Water Research Project technical Report #589.

Holland, R. F.
1986 *Preliminary Descriptions of the Terrestrial Natural Communities of California State of California*. Prepared for the California Department of Fish and Game.

Intergovernmental Panel on Climate Change (IPCC)
2013 *Climate Change 2013: The Physical Science Basis*. Available at http://www.ipcc.ch/report/ar5/wg1/. Accessed April 2015.

Lackey, J. B., and K. A. Clendenning
1965 Ecology of the microbiota of San Diego Bay, California. *Transactions of San Diego Bay Society of Natural History* 14(2):9–40

Largier, J. L.
1995 *San Diego Bay Circulation: A Study of Water in San Diego Bay for the purposes of Assessing, Monitoring and Managing the Transport and Potential Accumulation of Pollutants and Sediment in San Diego Bay*. Prepared for the California State Water Resources Control Board and the California Regional Water Quality Control Board, San Diego Region (Interagency Agreement # 1 – 188 – 190 – 0).

Living Coast Discovery Center
2015 Available at http://www.thelivingcoast.org. Accessed on May 6.

MacDonald, K. B.
1977 Coastal Salt Marsh. In *Terrestrial Vegetation of California*, edited by M. Barbour and J. Major, pp. 263–275. John Wiley and Sons, New York.

National Oceanographic and Atmospheric Administration (NOAA)

2003 U.S. Department of Commerce. National Ocean Service. Published Bench Mark Sheet for 9410170 San Diego, San Diego Bay, California. Publication Date: 06/03/1991. Superseded Date: 04/21/2003.

2011 Center for Operational Oceanographic Products and Services. Available at http://tidesandcurrents.noaa.gov/.

2015 *Sea Level Rise and Coastal Flooding Impacts*. Available at http://coast.noaa.gov/slr/. Accessed April 2015.

National Research Council (NRC)

2012 *Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future*. Washington, DC: The National Academies Press.

Oberbauer, Thomas, Meghan Kelly, and Jeremy Buegge

2008 Draft Vegetation Communities of San Diego County. March. Based on *Preliminary Descriptions of the Terrestrial Natural Communities of California*, Robert F. Holland, October 1986.

Office of Environmental Health Hazard Assessment (OEHHA)

2015 *Adoption of Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments*. Available at http://www.oehha.ca.gov/air/hot_spots/hotspots2015.html. Accessed April 2015.

Patton, Robert T.

2013 *The Status of the California Least Tern at San Diego Unified Port District Properties in 2012*. Prepared for the San Diego Unified Port District.

San Diego Association of Governments (SANDAG)

2011 2050 Regional Growth Forecast. Available at http://www.sandag.org/index.asp?projectid=355&fuseaction=projects.detail. Accessed February 1, 2015.

San Diego Gas & Electric (SDG&E)

2014 *SDG&E Substation Relocation Project Final Wetland Restoration Plan for the D Street Fill Site*. October.

2015 San Diego Regional Bike Path. Available at http://www.icommutesd.com/Bike/BikeMap.aspx. Accesses April 2015.

San Diego Unified Port of San Diego (SDUPD)

2012 *Port Master Plan Port Master Plan, San Diego Unified Port District*.

State Water Resources Control Board (SWRCB)

2015 Board Approved of Clean Water Act Section 303(d) List of Water Quality Limited Segments Region 9. Available at http://www.swrcb.ca.gov/water_issues/programs/tmdl/docs/303dlists2006/swrcb/r9_final303dlist.pdf. Accessed April 2015.

U.S. Department of the Navy, Southwest Division (U.S. Navy)

2013 *San Diego Bay Integrated Natural Resources Management Plan, and San Diego Unified Port District*. September 2013. San Diego, California.

U.S. Fish and Wildlife Service (USFWS)

1985 *Recovery Plan for the California Least Tern, Sterna Antillarum Brownii*. U.S. Fish and Wildlife Service, Portland, Oregon.

2006 San Diego Bay National Wildlife Refuge – Sweetwater Marsh and South San Diego Bay Units. *Final Comprehensive Conservation Plan and Environmental Impact Statement*. San Diego Bay National Wildlife Refuge Complex, Carlsbad, California. August.

2010 *Rising to the Urgent Challenge. Strategic Plan for Responding to Accelerating Climate Change*. Available at http://www.fws.gov/home/climatechange/pdf/CCStrategicPlan.pdf. Accessed April 2015.

2011 Endangered and Threatened Wildlife and Plants; Revised Critical Habitat for the Pacific Coast Population of the Western Snowy Plover. *Federal Register Proposed Rules*. Vol. 76, No. 55. March 22.

2012 Personal communication from Brian Collins to Chris Nordby regarding suitability of proposed restoration site for California least tern nesting. January.

Wang, P. F., R. T. Cheng, K. Richter, E. S. Gross, D. Sutton, and J. W. Gartner

1998 Modeling tidal hydrodynamics of San Diego Bay. Calif J. *Amer. Water. Ress. Ass.* 34(5):1123–1140.

APPENDIX A

GREENHOUSE GAS EMISSION CALCULATIONS

APPENDIX B

NATIVE AMERICAN NOTIFICATION LETTER

APPENDIX C

PUBLIC REVIEW DISTRIBUTION LIST

APPENDIX D

PUBLIC COMMENTS AND RESPONSES