CHAPTER 4
ENVIRONMENTAL CONSEQUENCES

This chapter includes an evaluation of the environmental impacts associated with implementation of the three alternatives for the Otay River Estuary Restoration Project (ORERP), including the proposed action. In accordance with Council on Environmental Quality (CEQ) regulations (40 CFR 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 National Environmental Policy Act (NEPA). Direct impacts are caused by an action and occur at the same time and place; indirect impacts are caused by an action later in time or farther removed in distance, but are still reasonably foreseeable. Indirect impacts may include growth-inducing impacts and other impacts related to induced changes in the pattern of land use, population density, or growth rate, and related impacts on air and water and other natural systems, including ecosystems. A cumulative impact is an impact on the environment that results from the incremental impact of an action when added to other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Impacts include ecological (such as the impacts on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historical, cultural, economic, social, or health impacts, whether direct, indirect, or cumulative. As required by NEPA, this document identifies impacts that may be beneficial or adverse.

According to the CEQ regulations (40 CFR 1508.27), the significance of an action must be analyzed in several contexts, such as society as a whole (human, national), the affected region, the affected interests, and the locality. Significance varies with the setting of the proposed action. A significant impact may exist even if a Federal agency believes that, on balance, the impact would be beneficial.

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 action; the duration of the impact (short or long term); and other considerations of context. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.

NEPA requires an evaluation of the environmental consequences of each alternative. The discussion within this chapter includes the potential for environmental impacts of each of the alternatives including the proposed action, any significant environmental impacts that cannot be avoided should the proposal be implemented, the relationship between short-term uses of the

human environment and the maintenance and enhancement of long-term productivity, and any irreversible or irretrievable commitments of resources that would be involved in the alternatives including the proposed action should they be implemented (40 CFR 1502.16). Determining how adverse an impact would be, for the purposes of NEPA, requires consideration of the "context and intensity" of the action (40 CFR 1508.27). The environmental consequence analysis may include significant adverse and/or beneficial impacts.

Analysis within this chapter of project-specific environmental impacts of the proposed action is intended to tier from the programmatic Environmental Impact Statement and Record of Decision for the *San Diego Bay National Wildlife Refuge Comprehensive Conservation Plan*, prepared by the U.S. Fish and Wildlife Service (Service) in 2006 (USFWS 2006).

4.1 SIGNIFICANCE CRITERIA

This document includes analysis of the impacts, both adverse and beneficial, of implementing the proposed action and other alternatives, including short- and long-term impacts. The criteria outlined in this section provide the basis for determining whether implementation of the alternatives, including the proposed action, would result in a significant impact on the environment.

Topography and Visual Quality

An impact to topography or visual quality would be considered significant if grading would result in the substantial alteration of locally or regionally important topographic landforms. Additionally, an action that would block public views to a scenic resource (such as the San Diego Bay) from existing public vantage points would represent a significant visual impact.

Geology, Soils, and Agricultural Resources

Impacts related to geology and soils would be considered significant if activities related to the proposed action would trigger or accelerate substantial slope instability, subsidence, ground failure, or erosion affecting on-site facilities such as levees, or adjacent facilities such as roadway and railway embankments and bridge abutments and pilings.

An impact to agricultural resources would be considered significant if an action would result in the conversion of a substantial area of land identified as Prime Farmland or Farmland of Statewide Importance to non-agricultural use.

Impacts to agricultural resources would be considered cumulatively significant if this action, in combination with other past, present, and reasonably foreseeable future actions, would result in the conversion of a substantial area of land identified by the State as Farmland of Local Importance to non-agricultural uses.

Mineral Resources

Impacts to mineral resources would be considered significant if a proposed action would result in the loss of the availability of a known mineral resource that would be of value to the region, such as by proposing incompatible uses on or in the vicinity (generally up to 1,300 feet) of an area classified as MRZ-2, on land classified as MRZ-3, on land underlain by Quaternary alluvium, or on or in the vicinity of areas known to contain industrial material and gemstone resources.

Paleontological Resources

Impacts to paleontological resources would be considered significant if a proposed action could directly or indirectly damage a unique paleontological resource or site, or if proposed grading or excavation would disturb the substratum or parent material in a paleontologically sensitive area.

Hydrology and Water Quality

Impacts related to the alteration of fluvial flows through a project site would be considered significant if grading or other actions within the floodplain would substantially increase the projected 100-year flood elevations upstream or downstream of the site, or would substantially alter flood flow velocities and associated erosional forces.

Impacts related to the alteration of tidal flows would be considered significant if projected tidal velocities following implementation of the proposed action would result in measurable scour of existing tidal channels or mudflats, or could jeopardize the stability of or increase the maintenance requirements for adjacent levees, levee breaches, bridge pilings, or other facilities.

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

Cumulative impacts related to fluvial or tidal hydraulics would be considered significant if a proposed action, in combination with other actions within the vicinity, would increase the currently projected 100-year flood elevations upstream or downstream of the project site, or could increase flood flow or tidal velocities, resulting in measurable scour or erosion upstream or downstream of the project site.

Cumulative water quality impacts would be considered significant if a proposed action, in combination with other actions within the vicinity, would result in violations of water quality

standards or waste discharge requirements, substantial increase of downstream sedimentation, or introduction of contaminants (non-point-source pollution) into the watershed.

Air Quality

Implementation of a proposed action would have a significant direct impact on air quality if the proposed action would result in emissions equal to or in excess of the standards outlined in Rule 1501 of the Air Pollution Control District's Rules and Regulations.

Implementation of a proposed action would have a significant direct impact on air quality if sensitive receptors are exposed to substantial pollutant concentrations, including air toxics such as diesel particulates, or if air contaminants are released beyond the boundaries of the project site. A significant increase in traffic congestion at nearby intersections due to actions associated with a proposed action would represent a significant indirect impact to air quality.

Cumulative impacts would be significant if the "de minimis" (minimum) thresholds developed by the U.S. Environmental Protection Agency for proposed Federal actions are exceeded in a non-attainment area, an area considered to have air quality worse than the National Ambient Air Quality Standards.

Noise

Noise generated by a proposed action that exceeds the affected city's noise standards at the project's property line would be considered a significant impact.

Cumulative noise impacts would be considered significant if the incremental increases in noise generated during construction of a proposed action, along with noise from other existing or anticipated actions in the area, would exceed accepted noise standards for any sensitive receptors in proximity to the project site.

Climate Change/Sea-Level Rise and Greenhouse Gases

The following factors were considered in addressing the impacts of climate change and sea-level rise: the potential impacts of the proposed action on climate change as indicated by its greenhouse gas (GHG) emissions, and the ways in which a changing climate over the life of a proposed action may alter the overall environmental implications of the proposed action. The potential significance of climate change and sea-level-rise impacts from and to the proposed action was assessed based on context and the intensity of the impacts.

Climate Change/Sea-Level Rise

The Service has not adopted guidance or developed a quantitative threshold for determining impacts of sea-level rise on a proposed action. The National Research Council's *Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future* contains sea-level-rise projections for California for three time periods over the coming century for areas located north and south of Cape Mendocino. The regional projections for areas 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). For the purposes of assessing climate change/sea-level-rise impacts associated with the proposed action, an analysis was conducted to determine the effects of sea-level rise on vegetation communities and habitat quality under both a 4.68-inch and a 24-inch rise in sea level for the year 2050. This analysis is consistent with the guidance provided in the California Coastal Commission's adopted sea-level-rise policy guidance document (Commission 2015), which contains guiding principles for addressing sea-level rise in the coastal zone.

Greenhouse Gases

The Service has not developed a quantitative threshold for determining whether a proposed action's GHG emissions would have a significant impact on the environment. Therefore, significance of GHG emissions were analyzed under the CEQ guidance, which was developed to assist Federal lead agencies in analyzing the significance of an action's GHG emissions under NEPA. The CEQ guidance recommends a quantitative threshold of 25,000 metric tons of carbon dioxide equivalent (CO_2E) per year. The CEQ guidance states, "In considering when to disclose projected quantitative GHG emissions, CEQ is providing a reference point of 25,000 metric tons CO_2E emissions on an annual basis below which a GHG emissions quantitative analysis is not warranted…. This is an appropriate reference point that would allow agencies to focus their attention on proposed projects with potentially large GHG emissions" (CEQ 2014). In addition to the recommended CEQ quantitative threshold, the proposed action would be considered to have a significant impact for GHG emissions if it would be inconsistent with applicable regulations, plans, or policies for reducing GHG emissions.

The guidance provided in the California Environmental Quality Act Guidelines (14 CCR 15064.4(b)) includes factors that California lead agencies should consider when assessing the significance of impacts from GHG emissions on the environment. These factors include the extent to which a proposed action may increase or reduce GHG emissions compared to the existing environmental setting; whether the proposed action's emissions exceed a threshold of significance that the lead agency determines applies to the proposed action; and the extent to which the proposed action complies with regulations or requirements adopted to implement a State-wide, regional, or local plan for the reduction or mitigation of GHG emissions. Impacts are

considered significant if a proposed action would conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the GHG emissions.

Contaminants

Impacts related to contaminants are considered significant when constituents of concern are present in or could be introduced into the soil, groundwater, or surface water at levels that exceed standard screening levels for assessing ecological risk.

Biological Resources

For this analysis, biological resources are broken into three separate categories: habitat and vegetation, wildlife and fisheries, and endangered and threatened species.

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

An impact to wildlife and fisheries would be considered significant if the proposed action 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 any 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.

Any impact to endangered or threatened species; any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations; any species identified as a candidate, sensitive, or special-status species by the California Department of Fish and Wildlife, the Service, or the 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.

Cultural Resources

An impact to cultural resources would be considered adverse if a resource listed in or eligible for listing in the National Register of Historic Places (NRHP) could be physically damaged or altered, isolated from the context associated with its listing, or affected by proposed action elements that would be out of character with the property or its setting. In addition, Title 36 of the Code of Federal Regulations, Part 800, defines impacts 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.

Cumulative effects to cultural resources would occur if the proposed action, combined with other past, present, and reasonably foreseeable actions, would result in changes to a cultural resource listed in or eligible for listing in the NRHP, its landscape, or its setting that collectively could result in a loss of integrity.

Land Use

Impacts to land use would be considered significant if substantial changes in the use or the intensity of use could occur on the project site that would affect adjacent or nearby properties. A significant impact to land use would also occur if an action or the activities proposed in association with the action are inconsistent with applicable land use regulations (e.g., Coastal Zone Management Act of 1972, as amended; California Coastal Act).

Cumulative impacts would be considered significant if the incremental direct or indirect impacts of a proposed action, when added to other related actions, would substantially alter the use or intensity of uses within the area.

Traffic, Circulation, and Parking

Impacts related to traffic would be considered significant if project-related traffic would exceed accepted increases in roadway volume-to-capacity ratios as established by the affected jurisdictions, if road capacities would be exceeded, if sight distance provided at ingress/egress points is inadequate, or if the proposed action would substantially alter the demand for on- and/or off-street parking spaces.

Cumulative traffic impacts would be considered significant if traffic generated by the proposed action, combined with other past, present, and reasonably foreseeable actions, would result in substantial changes to current traffic volumes, congestion at major intersections, or changes in current roadway conditions.

Public Utilities/Easements

Direct or indirect impacts to public utilities and easements would be considered significant if implementation of the proposed action would have the potential to damage existing utilities, interrupt utility service, or modify access to existing utilities.

Cumulative impacts would be considered significant if the proposed action would have the potential to incrementally affect public utilities and easements in the general vicinity of the action.

Public Access and Recreational Opportunities

Impacts to public access, education, and recreational opportunities would be considered significant if substantial modification to existing public recreation and educational activities or opportunities would occur as a result of the proposed action, or if existing public access would be substantially altered.

Cumulative impacts would be considered significant if the impacts of the proposed action, combined with other past, present, and reasonably foreseeable actions, would substantially alter public access and/or recreational opportunities.

Vectors and Odor

Impacts related to vectors and odor would be considered significant if the proposed action would have the potential to substantially alter wetland conditions conducive to mosquito breeding or to substantially alter the potential for odors to be generated from within the project site.

Cumulative impacts would be considered significant if the impacts of the proposed action, combined with other past, present, and reasonably foreseeable actions, would substantially alter conditions that support mosquito breeding or odor generation.

Economics and Employment

Impacts to the regional economy would be considered significant if the proposed action could substantially alter existing employment levels within the local or regional economy, set a precedent for future development trends in the vicinity of the proposed action, or seriously interfere with daily operations on adjacent commercial and industrial properties.

Cumulative impacts would be considered significant if the proposed action would result in incremental direct or indirect impacts on economic or employment opportunities.

Environmental Justice

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

Cumulative environmental impacts would be considered significant if the action would result in incremental direct or indirect impacts to undiversified communities.

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4.2 PHYSICAL ENVIRONMENT

Topics addressed under the physical environment section include direct and indirect impacts associated with topography/visual quality; geology, soils, and agricultural resources; mineral resources; paleontological resources; hydrology and water quality; air quality; noise; climate change; greenhouse gas emissions; and contaminants. Analysis of each of these resource areas includes the project site, which is defined by two non-contiguous sites, the Otay River Floodplain Site and the Pond 15 Site. In addition, the analysis within this section includes the impacts associated with additional project features required for implementation of the Otay River Estuary Restoration Project (ORERP or proposed action), as outlined in Section 2.3.2, Features Common to Both Action Alternatives, of this environmental impact statement (EIS).

4.2.1 Topography/Visual Quality

This section describes the impacts of the proposed action on the existing topography and the existing visual character and quality of the southern San Diego Bay landscape, which includes the Western Salt Company Salt Works facility and the adjacent Otay River floodplain. Because the proposed action would include the introduction of new and/or raised vertical features (i.e., new soil stockpiles displaying a height of not more than 8 feet and the raising of an approximately 1,400-foot segment of the existing levee between Ponds 22 and 23 by 2 feet), the potential for blockage of existing views afforded to primary viewer groups in the area is also addressed in this section.

Significance Threshold: For purposes of this analysis, impacts to topography or visual quality would be considered significant if grading would result in the substantial alteration of locally or regionally important topographic landforms. Additionally, an action that would block public views to a scenic resource (such as San Diego Bay) from existing public vantage points would represent a significant visual impact.

As identified in the *San Diego Bay National Wildlife Refuge (NWR) Final Comprehensive Conservation Plan* (CCP) and EIS (USFWS 2006), the predominant topographic features on the current project site are limited to the relatively low levee system in the salt works and the flat upland topography of the Otay River floodplain. These features are not considered to have local or regional importance; however, the open, undeveloped nature of the area does contribute to the overall visual quality of this portion of the San Diego Bay (Bay).

Viewer Groups

Residents

Proposed excavation and wetland restoration activities on the Otay River Floodplain Site would be visible from existing residential development located to the west in the vicinity of 13th Street

in Imperial Beach, as well as from a condominium development located to the southwest along the east side of 13th Street. Distant views of this restoration area are also available to some residents in the existing mobile home parks located to the south along Palm Avenue in the City of San Diego. Some residents across the Bay in the Coronado Cays also have distant views of the Pond 15 Site. For those residents with views of the eastern salt ponds, it would also be likely that some of the equipment needed to move excavated material from the Otay River Floodplain Site to the Pond 15 Site under the conveyor belt transport option would be visible. Because views from residences are private (and not public vantage points) and afforded to only those persons residing on a particular parcel/lot, the views of residents are not considered sensitive for the purposes of this analysis. Nevertheless, once the activities associated with implementing the proposed restoration action are completed, the area visible from these residences would remain open and undeveloped, resulting in no significant change in the quality of their views.

Motorists

Long, wide, and generally unencumbered views of the Otay River Floodplain Site and the eastern salt ponds are available to local motorists traveling along 13th Street, and distant views of the salt ponds are available to motorists traveling along the west of side the Bay on State Route 75.

Glimpses of San Diego Bay, the salt ponds, and in some cases the Pond 15 Site are also available to passing motorists on portions of Bay Boulevard and Palomar Street at Bay Boulevard. Limited views of the Otay River Floodplain Site are also available from the southbound lanes of Interstate 5 (I-5). These views are somewhat obscured by existing vegetation present along the freeway and on the adjacent restored floodplain.

Cyclists

An approximately 1.1-mile-long off-street segment of the Bayshore Bikeway traverses the project site. At the West Frontage Road/Main Street intersection, the bikeway transitions from an on-street bicycle route to an off-street bicycle path and turns west toward the salt works complex and San Diego Bay. This segment of the paved bike path is lined by 6-foot-tall black chain-link fencing (chain-link fencing is replaced by 6-foot-tall orange-brown bridge railing at river crossings) and is situated atop a mounded levee that extends along the north side of the Otay River channel, providing views of the salt ponds to the north and the Otay River Floodplain Site to the south.

Another bike path, which travels north/south between the northern terminus of Saturn Boulevard to the south and Main Street to the north, is located to the east of the Otay River Floodplain Site. Bicyclists along the route have views of the restoration site that are obscured in some locations by riparian vegetation.

Trail-Based Recreationists

An unpaved hike/bike path is located to the east of the Otay River Floodplain Site and provides connectivity between the Otay Valley Regional Park (OVRP) staging areas located west and east of I-5. The existing trail alignment provides trail-based north/south connectivity between the Saturn Boulevard and Main Street OVRP staging areas, as well as east/west connectivity between these staging areas and the Hollister Street OVRP staging area located east of I-5 near Hollister Pond and Louret Avenue (OVRP 2015). In addition, the hike/bike path connects to the existing alignment of the Bayshore Bikeway at the western terminus of Main Street. These trail-based recreationists (e.g., hikers, walkers, runners) are also considered viewer groups because they are currently afforded views of the Otay River Floodplain Site. Due to the density, height, and spread of riparian shrubs on the River Partners Restoration site, views to the salt works complex and San Diego Bay are generally not available to trail-based recreationists on the OVRP hike/bike path.

4.2.1.1 Alternative A

Under this alternative, no grading operations would occur, and there would be no alteration of the existing landform. Annual maintenance and habitat management activities for the San Diego Bay NWR would continue to occur, including mowing portions of the Otay River floodplain to reduce the threat of wildfire and the spread of invasive plant species. Views of the project site from the surrounding area would remain unchanged from the existing condition. No activities would occur that could block views of the site or across the site to significant scenic resources such as San Diego Bay. Since no grading operations, alterations to existing landforms, or other landscape-modifying activities would occur, no significant impacts to topography or visual quality are anticipated under this alternative. Additionally, this alternative would not result in the substantial alteration of any locally or regionally important topographic landforms or block public views to a scenic resource from existing public vantage points.

Although no grading or other landform alteration is proposed under this alternative, the project site is included in the area proposed for restoration in the programmatic CCP and EIS for the San Diego Bay NWR. Therefore, alteration of the floodplain could occur at some time in the future even under the no action alternative. However, before implementation of such a project, environmental analysis conducted in accordance with the National Environmental Policy Act (NEPA) would be required.

Mitigation Measures

No significant impacts are anticipated under Alternative A; therefore, no mitigation measures are required.

4.2.1.2 Alternative B

Restoration Sites

While San Diego Bay is a scenic resource, no locally or regionally important topographic landforms exist within the project boundary or in the immediate vicinity of the project site. Under this alternative, both the Otay River Floodplain Site and the Pond 15 Site would be modified to restore tidally influenced wetlands communities. To achieve these habitat changes, approximately 320,000 cubic yards of material would be excavated from a 33.51-acre area located on the Otay River Floodplain Site west of Nestor Creek. Following excavation, this area would be contour graded to the desired elevations within the restoration footprint.

The Pond 15 Site, the receiving site for the majority of the excavated material from the Otay River Floodplain Site, would also be graded and contoured to elevations suitable for supporting the proposed range of coastal wetland habitat types. In addition to filling the site to raise the elevations in the pond, once the material in the pond is adequately compacted, an approximately 200-foot-long segment of the outer levee in the northwestern perimeter of the pond would be breached to connect the pond to the Bay and establish routine tidal exchange within Pond 15.

The excavation proposed for the Otay River Floodplain Site and grading and filling proposed in the Pond 15 Site under Alternative B would result in minor changes to existing topography. The approximately 30-acre floodplain site would be excavated and as a result would display a visual character dissimilar from that of existing conditions during construction activities. The existing site consists primarily of former salt pond bottom and borrow areas, pockets of *Isocoma* scrub vegetation lacking diversity, and disturbed land. As a result, the floodplain site displays relatively low visual quality. Grading techniques to achieve varying elevations in the restored wetland and adjacent upland areas would be employed and are intended to mimic the natural topography of similar systems and wetland/upland transitions in the area. Similar grading techniques would be used following the filling of the Pond 15 Site. Once construction is complete and the restoration sites begin to revegetate, the Otay River Floodplain Site and Pond 15 Site would begin to appear and be experienced by local viewer groups as cohesive, natural elements of the larger San Diego Bay landscape.

Therefore, while the current visual quality and character of the project site would be altered as a result of construction activities, no views would be blocked, and implementation of the restoration plan for the project site would enhance the site's quality and character by increasing vegetative diversity and reintroducing subtidal, intertidal mudflat, and intertidal coastal salt marsh habit and systems to the landscape. Therefore, any impacts to topography or visual quality following the restoration of the project site would be less than significant.

Regarding the Pond 15 Site, due to distance and the presence of intervening vertical elements (i.e., vegetation and existing structures), the existing Pond 15 levees are not readily visible from outside the salt pond complex; therefore, proposed levee modifications would not substantially affect existing visual quality and would not block views of San Diego Bay from a public vantage point. Therefore, visual impacts due to levee modifications associated with Pond 15 restoration would be less than significant.

Construction Access between Restoration Sites

To allow for construction access to and between the two restoration sites, temporary crossings are proposed at Nestor Creek and the Otay River in the Otay River Floodplain Site and at the Palomar channel near the Pond 15 Site, as shown in Figure 2-1a, Project Features. In addition, temporary construction access roads would be constructed for the Otay River Floodplain Site between Nestor Creek and Main Street, and for the Pond 15 Site between Bay Boulevard and Pond 15, as shown in Figure 2-2, Truck Haul Route. The southern crossing at Nestor Creek, the construction access road, and construction staging areas would all be visible to cyclists on the Bayshore Bikeway and to some extent to trail-based recreationists on the OVRP trails to the east, but are not likely to be visible from any other public view points. The Palomar channel crossing may be visible from the on-street, Bay Boulevard segment of Bayshore Bikeway, public roadways, and local businesses within the general vicinity.

The temporary construction road and the crossing at the Palomar channel would occur in an existing industrial area composed of the salt works complex, one- to three-story office and commercial buildings, and vacant lots. Due to the ground-level location of the Palomar channel crossing and the presence of existing vertical features—including advertising signage, mature eucalyptus and palm trees near the western terminus of Palomar Street, and mature, spreading landscape trees installed around the two- to three-story concrete masonry unit Grainger Industrial Supply building at 1150 Bay Boulevard—visibility of the construction road and channel crossing from Palomar Street, Bay Boulevard, and the Bayshore Bikeway is limited. Also, motorists and cyclists are mobile viewers and experience the surrounding landscape in temporary fashion as they pass through a given area. Therefore, at locations where views of the construction road and channel crossing would be available, viewers would not be able to visually fixate on these subtle, temporary changes to the larger San Diego Bay landscape. Furthermore, at the completion of construction, the landform would be restored to pre-project conditions and revegetated with the appropriate native vegetation, avoiding any long-term changes to the topography or visual appearance of the area.

Material Transport Options

The proposal includes three options for transporting the material excavated from the western portion of the Otay River Floodplain Site to the Pond 15 Site. The first option involves using haul trucks to bring excavated material to the Pond 15 Site. The truck haul route would use the same construction access routes and temporary crossings described above for general construction access to the sites. It would also require the use of public streets, as presented in Figure 2-2. Haul trucks would be active on these streets almost continuously for 8 hours during scheduled work days. Although an influx of haul trucks would alter the existing visual quality of views by introducing motion and new vertical and rectangular features that could affect the availability of long, wide views of the San Diego Bay from the southernmost segment of West Frontage Road and segments of Bay Boulevard between L Street and Anita Street, effects would be temporary and would not involve permanent, long-term visual change to the existing landscape. In addition, haul trucks would not remain stationary in a single location along haul routes for substantial amount of time. Furthermore, viewer groups that would experience altered views during haul truck operations (i.e., motorists and cyclists) would also be mobile; therefore, potential view blockage that may occur as a result of haul truck traffic in the area would be short and experienced briefly. Therefore, due to the temporary and mobile nature of haul truck trips and the lack of long-term permanent visual change that would occur as a result of haul truck trips the project area, impacts to visual quality and existing views of the San Diego Bay associated with haul truck trips would be less than significant.

The second transport method would involve the use of conveyor belts to transport excavated material from one portion of the site to another. Conveyor belts may be used to move excavated material within the Otay River Floodplain Site part of the distance between the Otay River Floodplain Site and the Pond Site 15, or all the way between the two sites. In the case in which the conveyor belt would extend from the Otay River Floodplain Site to the salt works, the belt would be installed over the Otay River and under the Bayshore Bikeway and would then continue northward using the existing levees for support. Within the salt works, the conveyor belt could be placed in one of two potential alignments as shown on Figure 2-4, Conveyor Belt Haul Routes. Due to the anticipated low vertical profile of the conveyor belt, this delivery method is not anticipated to be readily visible to trail-based recreationists or motorists traveling in the vicinity of the project site. The system would be visible to Bayshore Bikeway cyclists traveling between Ponds 10 and 48, but would not obscure views of the salt ponds and Bay.

While there may be specific locations from Frontage Road and Bay Boulevard where viewing conditions allow for enhanced visibility to the conveyor belt alignment, the system would be located beyond multiple salt ponds and several levees and would not be visually prominent or overly discernible to mobile viewers. Furthermore, because the viewshed in the

immediate vicinity of the potential conveyor belt system is not pristine (i.e., the landscape primarily consists of salt ponds actively used for commercial purposes to produce and extract salt), the inclusion of the conveyor belt system in available views would not represent a significant adverse effect on the overall visual quality of the area. The conveyor belt would be removed at the completion of construction activities, and the landform where it was installed would be restored to pre-project conditions. As a result, impacts to the existing visual quality of the San Diego Bay landscape associated with the temporary operation of the conveyor belt system would be less than significant.

The third option for material transport would be a pipeline used to move the material once it has been mixed with water from the Otay River to create a slurry. Two potential alignments are proposed for the slurry pipeline option (see Figure 2-5, Pipeline Haul Routes). After being extended over the Otay River and under the existing Bayshore Bikeway alignment crossing to the salt works complex, the pipeline would extend north either along existing levees or by being floated in the existing salt ponds. The pipeline would be present in the area for 2 years. The potential effects to the visual quality in the area and potential for view blockage would be similar to those described above for the conveyor belt system; however, a pipeline located just above the ground or on the surface of the ponds would be less visible from adjacent areas than a conveyor belt.

Although each of these three material transport methods (i.e., conveyor belt, pipeline, and presence of trucks on the project site) would temporarily alter the existing visual quality in the general vicinity of the project for a period of 2 years, none of the methods would substantially block public views of San Diego Bay. Therefore, impacts associated with transportation of the material between the Otay River Floodplain Site and the Pond 15 Site would not represent a significant visual impact.

Levee Modifications and Channel Protection

In addition to project construction features that would be implemented to facilitate the distribution of material between the two sites, additional project features would be implemented, as outlined in Section 2.3.2. An approximately 1,400-foot-long segment of the existing levee between Ponds 22 and 23 would be raised by 2 feet, the existing levee along the southern bank of the Otay River would be removed, and a new levee would be constructed along the southern edge of the restored wetland. In addition, slope armoring (e.g., a 1-foot layer of 5-inch (D50) rock) extending approximately 1,100 feet long and approximately 60 feet wide is proposed along the southern slope of the Bayshore Bikeway in the vicinity of Pond 48 to address increases in flood flow velocities in the river channel under this alternative.

Raising a 1,400-foot segment of the earthen levee separating Ponds 22 and 23 an additional 2 feet would not result in substantial view blockage or substantially affect the existing visual quality of the San Diego Bay landscape. Public vantage points in the vicinity of the levee consist of the Bayshore Bikeway and the system of pedestrian paths located north of the bikeway alignment and south of Pond 22. On the Otay River floodplain, segments of the Bayshore Bikeway are located at an elevation similar to that of the existing levee; however, substantial view blockage of the San Diego Bay would not occur because any change in view would last for only a short time as the bicyclist or pedestrian travels along the path. After crossing the Otay River Bridge, the elevation of the bikeway increases and cyclists and pedestrians are situated approximately 7 to 10 feet above the elevation of the levee. From these elevated locations, raising the levee an additional 2 feet would not encumber existing views, and viewers would continue to be afforded wide and long views of the San Diego Bay and more distant scenic features.

Because removal of the existing levee along the northern boundary of the Otay River Floodplain Site would effectively remove an existing vertical feature (and potential view blockage element) from the landscape, levee removal would not result in blockage of existing San Diego Bay views in the surrounding area. Also, because the new levee to be constructed along the southern edge of the restored wetland would be constructed at an elevation lower than that of surrounding public vantage points, construction of the levee would not create substantial blockage of existing views from public vantage points in the surrounding area. Additionally, because the floodplain restoration site is currently a mounded and bermed landform, reintroduction of a mounded, bermed landform along the site's southern boundary would not substantially alter the existing quality of the visible landscape.

Slope armoring along approximately 1,100 feet of the northern slope of the Otay River channel would be visible from the Bayshore Bikeway. This 1,100-foot-long, 60-foot-wide area would include a 1-foot layer of 5-inch (D50) rock to be introduced along the unvegetated and partially screened portion of the existing descending slope located north of the existing bikeway alignment. The installation of this project feature, although obscured from view from all but users on the Bayshore Bikeway, would alter the current visual quality of the area. No views would be blocked; however, the presence of this rock over a large portion of the salt pond levee would represent a visually prominent project feature. To minimize the effect of this feature on views from the Bayshore Bikeway, Mitigation Measure (MM) VIS-1 is provided (see Mitigation Measures in this section). Following implementation of MM-VIS-1, visual impacts associated with this feature would be reduced to less than significant.

Stockpiles

Material excavated from the western portion of the Otay River Floodplain Site that is not needed for restoration or the implementation of project features would be stored on the Otay River Floodplain Site in two stockpiles for use on future San Diego Bay NWR projects. The stockpiles, which would be approximately 8 feet in height, would remain on the site for an unspecified period of time.

The two stockpiles, which would each measure about 500 feet long by 200 feet wide and display a height of no greater than 8 feet (as illustrated in Figure 2-3b, Proposed Stockpiles Details), would be visible from the Bayshore Bikeway. In addition, the stockpiles may be visible from the OVRP hike/bike path trails and residential development to the south. Views of the stockpiles from the southbound travel lanes of I-5 to the east would likely be obscured by the trees and shrubs present between I-5 and the project site.

Although the proposed stockpiles would be located on uplands previously disturbed by agricultural and municipal activities, the bulk and height of the mounds would not be consistent with the surrounding, relatively flat natural topography of the Otay River floodplain, thereby altering the existing topographic character of the site. However, once the soil is removed for other purposes, the topographic character of the site would be restored. Because the topographic character of the area would be restored in the future, no significant irreversible change to the site topography would result; therefore, the primary issue associated with the presence of these mounds is visual quality.

If left as unvegetated semi-rectangular mounds of dirt, these stockpiles would adversely affect the visual quality of the area; therefore, to minimize the visual effect of the stockpiles and improve their overall appearance within the landscape, the top and side slopes of the mounds would be hydroseeded with appropriate native vegetation. The establishment of native vegetation and associated root systems would also ensure soil stability.

The proposal to align the stockpiles in an east/west orientation would ensure minimal blockage of distant views of San Diego Bay from the OVRP trails and I-5. Furthermore, because the piles would be located to the south of the Bayshore Bikeway, they would not block public views of the San Diego Bay available to Bikeway cyclists and pedestrians. While the mounds would be visible in the southerly view of Bikeway users, this view would be softened once the proposed native vegetation is established. Additionally, no recognized scenic resources are present to the south that would be blocked from view by the mounds. Although excavation and grading associated with the restoration of tidally influenced wetland habitats within the Otay River Floodplain Site and Pond 15 Site, as proposed in Alternative B, would not result in any significant adverse effects related to topography or visual quality, the placement of excess material from this excavation

into two stockpiles on the Otay River Floodplain Site would introduce inconsistent landforms to the Otay River Floodplain Site. Therefore, MM-VIS-1 has been incorporated into the scope of the project to reduce the visual effects of these stockpiles to below a level of significance.

Mitigation Measures

MM-VIS-1: A revegetation plan for the implementation of vegetative screening adjacent to the Otay channel protection project feature (if implemented), and revegetation of on-site stockpiles shall be approved by the U.S. Fish and Wildlife Service (Service) and the California Coastal Commission prior to the initiation of any grading in either project site. The revegetation plan shall be prepared by a qualified restoration specialist and shall identify the proposed plantings, hydroseed mix, and applicable treatment, monitoring, and success criteria for both areas. The revegetation plan shall include the following requirements for each location:

Otay channel protection vegetative screening: Following installation of the Otay channel protection (if required) as proposed adjacent to the Bayshore Bikeway and Pond 48 (Project Feature 2, as shown on Figure 2-1a of the EIS), low shrub vegetation shall be installed to enhance existing visual screening of the Otay channel. Vegetative screening shall be implemented on the south side of the fence line along the Bayshore Bikeway where channel armoring is visible to cyclists utilizing the Bikeway. Planting of low shrub vegetation shall only be required where existing vegetation does not adequately screen views of the proposed armoring for Otay channel protection project feature. Plant material to be installed and planting density/spacing shall be consistent with existing vegetation located on the south side of Bikeway-adjacent fencing, or as adequate to screen views of the project feature.

Stockpile vegetation: Immediately upon completion of all material transport activities from the Otay River Floodplain Site, all necessary grading and compaction of the two stockpiles shall be completed and an appropriate hydroseed mix shall be applied to the top and slopes of the stockpiles.

The Otay Channel Protection area and stockpile revegetation efforts shall be monitored and maintained during the establishment of the vegetation to control weeds and ensure that both sites are meeting applicable success criteria identified in the revegetation plan for vegetative cover. If necessary to meet these success criteria, additional hydroseeding and/or plantings shall be conducted and/or adaptive management measures shall be implemented as needed until the Otay Channel Protection area vegetative screening area and stockpiles are adequately

vegetated. Each location shall continue to be monitored and maintained for a period of 5 years after the success criteria has been met to ensure that no significant weed infestations or vegetation losses are occurring. Monitoring reports shall be submitted to the Service annually to detail the progress towards achieving the required species and vegetation coverage. Once the approved success criteria have been met, a final report shall be submitted to the Service to document completion in accordance with the approved revegetation plan.

4.2.1.3 Alternative C

With the exception of total excavated materials from the Otay River Floodplain Site and associated truck trips required to export the materials to locations within the project area, Alternative B and Alternative C include similar project features. Therefore, implementation of Alternative B or Alternative C would likely result in similar visual change to the existing San Diego Bay landscape.

Under Alternative C, both the Otay River Floodplain Site and Pond 15 Site would be restored to tidally influenced wetland communities similar to those described under Alternative B. However, Alternative C would also include subtidal wetland habitat at completion of construction, as described in Section 2.3.5, Comparison of Alternatives. To achieve this additional subtidal habitat, the portion of the Otay River Floodplain Site located to the west of Nestor Creek would be excavated to remove approximately 370,000 cubic yards of material, approximately 50,000 cubic yards more than Alternative B. Following excavation, the portion of the Otay River Floodplain Site west of Nestor Creek would be contour graded to achieve the desired elevations within the restoration footprint and graded to mimic adjacent topography and landform.

The three options for material transport proposed to facilitate the redistribution of material between the western portion of the Otay River Floodplain Site and the Pond 15 Site are also applicable to restoration under this alternative. The same levee modifications and project features outlined for Alternative B would be implemented under this alternative, resulting in similar impacts to visual quality as analyzed in detail above. To minimize the visual impact related to the proposed rock revetment along Pond 48, MM-VIS-1, described under Alternative B, would be incorporated into the scope of the project if Alternative C is implemented.

Similar to implementation of Alternative B, implementation of the restoration proposals included in Alternative C would not result in the substantial alteration of the topography or visual quality of the area. However, Alternative C also includes a proposal to stockpile excess material on the Otay River Floodplain Site, with the dimensions of the stockpiles identical to those described under Alternative B. Consistent with the analysis and conclusions presented under Alternative B, the placement of these stockpiles on the Otay River floodplain under Alternative C would alter

the visual quality of the area. As a result, MM-VIS-1 would be incorporated into the scope of the project to reduce the visual effects of these stockpiles to below a level of significance.

Mitigation Measures

MM-VIS-1, as outlined for Alternative B, would also be implemented for this alternative. With the implementation of this measure, no significant impacts related to topography or visual quality are anticipated.

4.2.2 Geology, Soils, and Agricultural Resources

This section analyzes the potential impacts related to geology, soils, and agricultural resources that would result from the implementation of each of the three proposed alternatives. The susceptibility and/or contribution of the alternatives are described in terms of their potential direct or indirect impact on the public. The following five technical reports were prepared for this project and applicable information was included in this analysis:

- *Limited Site Assessment for MKEG Property – Palm City Saturn Boulevard (19th Street)*, prepared by GEOCON in April 1989
- *Sediment Characterization Sampling and Analysis Report South San Diego Salt Ponds 12,13,14,15*, prepared by Anchor QEA in April 2014 (provided as Appendix F1)
- *Sampling and Analysis Report Otay River Estuary Restoration Program Soil Characterization Program*, prepared by Anchor QEA in March 2013 (provided as Appendix F2)

The conclusions from each of these reports are incorporated into the discussion below.

4.2.2.1 Geology and Soils

Significance Threshold: Impacts related to 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, such as levees, or adjacent facilities, such as roadway and railway embankments and bridge abutments and pilings.

4.2.2.1.1 Alternative A

Under this alternative, no grading operations would occur on either project site; instead, annual San Diego Bay NWR maintenance and habitat management activities would continue as in the existing condition. Although no additional actions are proposed under this alternative, as described in Section 3.2.2, the existing condition the Otay River Floodplain Site is at risk for liquefaction and settlement due to existing soil and groundwater conditions

in the area. This alternative would not alleviate these hazards, and the Pond 15 Site and project features 1, 9, 10, 11, 12, and 13 as shown on Figure 2-1a would continue to be at risk for inundation should an offshore earthquake cause a tsunami. However, no actions are proposed that would trigger or accelerate substantial slope instability, subsidence, ground failure, or erosion.

Mitigation Measures

No significant impacts are anticipated under Alternative A; therefore, no mitigation measures are required.

4.2.2.1.2 Alternative B

As described previously, the project sites are underlain with soils and groundwater conditions that put these areas at risk for impacts related to seismic ground shaking, seismically induced liquefaction, and settlement. The Pond 15 Site and project features 1, 9, 10, 11, 12, and 13 as shown on Figure 2-1a are also susceptible to inundation from a tsunami in the event of a large magnitude earthquake. Implementation of this alternative would not increase the risk of these geologic hazards at the project sites. Additionally, Alternative B does not include placing structures or people in an area susceptible to these hazards. Therefore, this alternative would not result in significant impacts related to geologic hazards.

Under this alternative, the project sites would be reconfigured to achieve ground elevations appropriate for supporting tidally influenced wetland vegetation. Excavation on the Otay River Floodplain Site, on the Pond 15 Site, and at other sites where project features are proposed would expose soils that could lead to increased risk for slope, levee, and/or riverbank failure and increased erosion. Construction vehicle movement along and adjacent to levees could also result in soil instability. Finally, there is the potential for compaction of the underlying soils in Pond 15 due to the weight of the soils that would be added to the area to achieve elevations in the pond that would support intertidal habitats.

The construction plans for Alternative B have been designed to address the potential for such effects. For example, levees within the salt pond operation that would be needed for construction access would be improved and widened as necessary to ensure the continued integrity of the roadbed and associated slopes. Levees around Pond 15 would be reinforced before dewatering to ensure soil stability during construction, as well as once tidal influence is restored to the pond. Fill quantities proposed for Pond 15 have been determined after taking into consideration the potential for some compaction of the underlying soils, and where creek channels must be crossed for construction access, the crossings have been designed to ensure the integrity of the channel banks. Temporary erosion control measures would also be implemented during construction to minimize the potential for soil instability in areas disturbed by project activity during significant

rain events and permanent features proposed to ensure long-term slope stability include appropriate slope gradients and establishment of suitable vegetation on newly constructed slopes. Similar measures would be implemented to ensure the stability of the new levee to be constructed along the southern edge of the Otay River Floodplain Site.

The slopes of the two stockpiles that would be created as part of the project would also be at risk for slope failure and erosion. To minimize the potential for such impacts, the slopes would be compacted and maintained at a slope gradient of 4:1 or flatter. Temporary erosion control measures would be implemented while the stockpiles are being created and more permanent measures would be implemented upon project completion, as described in Section 2.3.2. Similar measures would be implemented to ensure the stability of the new levee to be constructed along the southern edge of the Otay River Floodplain Site.

Once construction is complete, a small amount of sedimentation would be natural and is anticipated to occur on the project site. All slopes would be compacted at a gradient of 3:1 or flatter and all but one would be vegetated with native plants to protect and reinforce the underlying soils. The gradient of the slopes on the relocated levee along the southern boundary of the Otay River Floodplain Site and the levee to be raised between Ponds 22 and 23 would be 3:1. The relocated levee would be revegetated with appropriate native plants, but successfully vegetating the levee between Ponds 22 and 23 would be difficult due to the high salinity levels in the adjacent ponds. Erosion control measures would be retained in place at this location until the slopes are determined to be stable. Adherence to these design standards would minimize the potential for slope failure and excessive sedimentation. To reduce the potential for erosion and to minimize forces that could impact slope stability during and after construction, MM-GEO-1 has been incorporated into the scope of Alternative B. To ensure the long-term stability of soil stockpiles to be placed on the Otay River Floodplain Site east of Nestor Creek, measures described in MM-GEO-2 have been incorporated into the scope of the project under Alternative B. The implementation of MM-GEO-1 and MM-GEO-2 would reduce the potential for significant adverse effects related to soil erosion and slope instability to below a level of significance. An analysis of the potential for increased erosion from water and wind as a result of implementation of Alternative B is addressed in Section 4.2.5, Hydrology and Water Quality, of this EIS.

Mitigation Measures

To avoid or minimize significant impacts from site grading related to slope instability, subsidence, ground failure, or erosion, the following measures have been incorporated into the scope of the project:

MM-GEO-1 A project-specific stormwater pollution prevention plan (SWPPP) shall be prepared and approved by the U.S. Fish and Wildlife Service (Service) and the Regional Water Quality Control Board before the start of construction. The SWPPP shall be implemented by the contractor throughout the duration of construction, including while construction activities are temporarily halted during the core nesting season. The best management practices (BMPs) contained in the SWPPP shall include, but are not limited to, silt fences, fiber rolls, gravel bags, and soil stabilization measures such as erosion control mats and hydroseeding to prevent soil erosion and sedimentation during wind and rain events. Implementation of these BMPs as delineated in the SWPPP shall apply to all areas proposed for excavation. Structural BMPs (or suites of BMPs) shall be designed to treat, infiltrate or filter the amount of stormwater runoff produced by all storms up to and including the 85th percentile, 24-hour storm event for volume-based BMPs, and/or the 85th percentile, 1-hour storm event, with an appropriate safety factor (i.e., 2 or greater), for flow-based BMPs. The SWPPP shall also include a schedule and protocols for inspection, cleaning and repairing of BMPs. The Service is responsible for ensuring that the contractor implements and maintains the BMPs identified in the SWPPP.

MM-GEO-2 To ensure the long-term stability of all slopes created within the project site, a post-construction erosion control plan shall be prepared by a registered professional engineer or certified hydrogeologist and approved by the Service prior to the commencement of grading. A map or graphic shall be included in the erosion control plan identifying the locations and specific erosion and sedimentation control measures to be implemented. As part of the erosion control plan, the contractor shall be required to confirm that slope gradients are constructed as designed, all post-construction erosion control measures are in place, and the slopes are planted or seeded immediately upon completion of construction activities consistent with the revegetation plan as identified in MM-VIS-1.

Planting and/or seeding of slopes and stockpiled material shall be monitored and maintained during establishment of the vegetation to ensure that vegetative cover, as determined by a qualified restoration specialist, is achieved as specified in the revegetation plan identified in MM-VIS-1.

In addition to stockpile hydroseeding and establishment of vegetative cover, the following measures shall be implemented, as deemed necessary by a registered professional engineer or certified hydrogeologist, as part of the erosion control plan, to prevent erosion of stockpiled material:

- Topographic controls such as contouring and terracing shall be implemented, if necessary, to limit scouring resulting from steeply sloped piles during large rain events.
- A trench or drainage channel overlain by rock check dams shall be installed at the base of the stockpiles to divert stormflow away from adjacent wetland areas and treat stormwater runoff during large rain events.
- Biodegradable wattles and erosion control blankets shall be installed over the stockpiles until vegetative cover is sufficiently established. Wattles and/or blankets would not need to be removed following vegetative establishment.

The stockpiles shall continue to be monitored and physically maintained in perpetuity after the success criteria has been met to ensure that no significant weed infestations or vegetation losses are occurring, and that all required runoff control measures are operating effectively to the satisfaction of the registered professional engineer or certified hydrogeologist. Poseidon would be responsible for long-term monitoring and maintenance of the stockpiles until their eventual deconstruction.

4.2.2.1.3 Alternative C

Impacts to geology and soils associated with Alternative C would be similar to those outlined for Alternative B in Section 4.2.2.1.2. Under this alternative, approximately 50,000 cubic yards of additional material would be excavated from the Otay River Floodplain Site west of Nestor Creek and transported to the Pond 15 Site. This increase in excavation would not, however, represent an increased potential for erosion or slope instability.

As with Alternative B, there is the potential for seismic hazards in the project area, including ground shaking, liquefaction, settlement, and tsunami (as stated previously, the Pond 15 Site and project features 1, 9, 10, 11, 12, and 13 as shown on Figure 2-1a are located within the tsunami inundation zone (CalEMA 2009)). The risk of these geologic hazards occurring at the project site would not increase as a result of implementation of Alternative C. Additionally, the proposed action does not include placing structures or people in an area susceptible to these hazards. Therefore, this alternative would not result in significant impacts related to geologic hazards. As described for Alternative B, excavation on the Otay River Floodplain Site, on the Pond 15 Site,

and at other sites where project construction features are proposed would expose soils that could lead to increased risk for slope, levee, and/or riverbank failure and increased erosion, and as with Alternative B, the construction plans for Alternative C have been designed to address the potential for such effects. Temporary erosional control measures would be implemented to ensure slope stability and following the completion of construction, slopes created on the Otay River floodplain would be vegetated with native species that would enhance slope stability.

Similarly to Alternative B, erosion and slope stability may be impacted during construction and through the implementation of soil stockpiles on the Otay River Floodplain Site east of Nestor Creek. MM-GEO-1 and MM-GEO-2 would be implemented for Alternative C. The implementation of these measures would reduce the potential for significant adverse effects related to soil instability to below a level of significance.

Mitigation Measures

MM-GEO-1 and MM-GEO-2, as outlined for Alternative B, would also be implemented under Alternative C. With the implementation of these measures, no significant impacts are anticipated.

4.2.2.2 Agricultural Resources

Significance Threshold: An impact to agricultural resources would be considered significant if an action would result in the conversion of a substantial area of land identified as Prime Farmland or Farmland of Statewide Importance to nonagricultural use.

4.2.2.2.1 Alternative A

Although approximately 35.6 acres of the Otay River Floodplain Site are designated as Farmland of Local Importance on the California Department of Conservation, San Diego County Important Farmlands 2010 Map (California Department of Conservation 2013a), this area has not been used for agricultural purposes since 1988. Alternative A does not propose any change to the existing land use and would therefore have no potential to convert land identified as Farmland of Statewide Importance (California Department of Conservation 2013b) to nonagricultural use. As a result, the implementation of Alternative A would have no impact on agricultural resources.

Mitigation Measures

No impacts on agricultural resources are anticipated under Alternative A; therefore, no mitigation measures are required.

4.2.2.2.2 Alternative B

As discussed in Section 3.2.2, Geology, Soils, and Agricultural Resources, of this EIS, the western portion of the Otay River Floodplain Site is designated as Other Land, and 35.6 acres of the eastern portion of the Otay River Floodplain Site, including land proposed for implementation of project features, is designated as Farmland of Local Importance on the California Department of Conservation, San Diego County Important Farmlands 2010 Map (California Department of Conservation 2013a). This alternative involves restoration of approximately 33.51 acres of coastal wetlands within the Otay River Floodplain Site, all on land designated as Other Land. The 90.90 acres within the Pond 15 Site is also designated as Other Lands on the San Diego County Important Farmlands 2010 Map.

The area designated as Farmland of Local Importance east of the Otay River Floodplain Site would not be permanently affected under this alternative. There would be short-term construction-related impacts to this area, including construction staging and the stockpiling of excess material from the Otay River Floodplain Site, as shown on Figure 2-1a. Although stockpiled material would remain on the eastern portion of Nestor Creek after the completion of construction, the underlying soils would not be significantly impacted.

Therefore, the proposed action would not result in the loss of soils identified as supporting Farmland of Local Importance, and a substantial area of land with this designation would not be converted to nonagricultural use. No significant impacts related to agricultural resources would occur under Alternative B.

Mitigation Measures

No significant impacts to agricultural resources are anticipated under Alternative B; therefore, no mitigation measures are required.

4.2.2.2.3 Alternative C

The potential impacts to agricultural resources from the implementation of Alternative C would be the same as those described for Alternative B.

Mitigation Measures

No significant impacts to agricultural resources are anticipated under Alternative C; therefore, no mitigation measures are required.

4.2.3 Mineral Resources

Significance Threshold: Impacts to mineral resources would be considered significant if a proposed action resulted in the loss of the availability of a known mineral resource that would be of value to the region, such as proposing incompatible uses on or in the vicinity (generally up to 1,300 feet) of an area classified as Mineral Resource Zone 2, on land classified as Mineral Resource Zone 3, on land underlain by Quaternary alluvium, or on or in the vicinity of areas known to contain industrial material and gemstone resources.

4.2.3.1 Alternative A

As outlined in Section 3.2.3, Mineral Resources, both the Otay River Floodplain Site and the Pond 15 Site are classified by the City of San Diego as a Mineral Resource Zone 1, which is considered an area where no significant mineral deposits are present, or where it is judged that there is little likelihood of their presence (City of San Diego 2008). Therefore, implementation of this alternative would not result in the loss of availability of known mineral resources that would be of value to the region. Impacts would be less than significant.

Mitigation Measures

No significant impacts to mineral resources are anticipated under Alternative A; therefore, no mitigation measures are required.

4.2.3.2 Alternative B

The potential impacts to mineral resources from the implementation of Alternative B would be the same as those described for Alternative A.

Mitigation Measures

No significant impacts to mineral resources are anticipated under Alternative B; therefore, no mitigation measures are required.

4.2.3.3 Alternative C

The potential impacts to mineral resources from the implementation of Alternative C would be the same as those described for Alternative A.

Mitigation Measures

No significant impacts to mineral resources are anticipated under Alternative C; therefore, no mitigation measures are required.

4.2.4 Paleontological Resources

Significance Threshold: Impacts to paleontological resources would be considered significant if a proposed action could directly or indirectly damage a unique paleontological resource or site, or if proposed grading or excavation would disturb the substratum or parent material below the major soil horizon in a paleontologically sensitive area.

4.2.4.1 Alternative A

Under this alternative, no ground-disturbing activities are proposed. Therefore, there is no potential to directly or indirectly damage unique paleontological resources. Impacts would be less than significant.

Mitigation Measures

No significant impacts to paleontological resources are anticipated under Alternative A; therefore, no mitigation measures are required.

4.2.4.2 Alternative B

The Antiquities Act of 1906, as amended (P.L. 59-209; 34 Stat. 225; 16 U.S.C. 431–433), was the first law enacted to protect the historic or prehistoric ruins or monuments, on any objects of antiquity, situated on lands owned or controlled by the Federal government. This act does not refer to paleontological resources specially; however, the protection of "objects of antiquity" has been interpreted to include paleontological resources. In addition to Federal requirements of the protection of paleontological resources, the Society of Vertebrate Paleontology (SVP) has established standard guidelines that outline professional protocols and practices for conducting paleontological resource assessments and surveys, monitoring and mitigation, data and fossil recovery, sampling procedures, and specimen preparation, identification, analysis, and curation (SVP 2010). Most practicing professional vertebrate paleontologists adhere closely to the SVP's assessment, mitigation, and monitoring requirements included in the guidelines. Regulatory agencies often accept and use the professional standards set forth by the SVP.

The SVP (2010) has established three categories—high, low, and undetermined—to assign the paleontological sensitivity of an area or the potential for a stratigraphic or bed unit to yield significant paleontological resources. Each of these categories affects the degree to which paleontological mitigation is required.

A high potential for paleontological resources is assigned to those stratigraphic units from which vertebrate or significant invertebrate fossils or suites of plant fossils have been previously recovered. Such units include, but are not limited to, sedimentary formations and some volcanic formations that contain significant nonrenewable paleontological resources anywhere within their geographical extent and sedimentary rock units temporally or

lithologically suitable for the preservation of fossils. Sensitivity comprises (a) the potential for yielding abundant or significant vertebrate fossils or for yielding a few significant fossils, large or small, vertebrate, invertebrate, or botanical, and (b) the importance of recovered evidence for new and significant taxonomic, phylogenetic, ecologic, or stratigraphic data. Areas that contain potentially datable organic remains older than Recent, including areas that may contain new vertebrate deposits, traces, or trackways, are also considered to have high sensitivity.

Various geotechnical assessments have been prepared for the project sites over the years. Based on the information they provide, the eastern portion of the Otay River Floodplain Site is underlain with uncompacted fill and alluvial/bay deposits (GEOCON 1989), while the western portion is underlain with undocumented fill, estuarine deposits, unnamed marine shore sandstone, and the Bay Point Formation (Geotechnics Incorporated 2000). The Pond 15 Site is underlain by bay deposits, older bay/alluvial deposits, and the Bay Point Formation.

The City of San Diego (2007) identifies the Otay Nestor area, which includes portions of the Otay River floodplain, as having a moderate paleontological sensitivity, although the new alluvial deposits found close to the surface in this area have a low sensitivity. The Bay Point Formation is assigned a high sensitivity; however, on the project site, this formation occurs at great depth due to the presence of fill and alluvial/bay deposits over much of the project site. If the Bay Point Formation would be encountered subsurface, a potentially significant impact to paleontological resources would occur; therefore, a mitigation monitoring program would be required to ensure salvage of nonrenewable paleontological resources. To reduce potentially significant impacts to paleontological resources as a result of implementing Alternative B, MM-PALEO-1 would be implemented.

Mitigation Measures

MM-PALEO-1: Prior to commencement of any grading activity on site, Poseidon shall retain a qualified paleontologist, subject to the review and approval of the U.S. Fish and Wildlife Service (Service). The qualified paleontologist shall be on site during all rough grading and other significant ground-disturbing activities in depths greater than 10 feet below ground surface.

The paleontologist shall prepare a paleontological resources impact mitigation program for the proposed action. The program shall be consistent with the guidelines of the Society of Vertebrate Paleontologists (2010) and shall include the following:

- Attendance at the pre-construction conference by a qualified paleontologist or his/her representative.

- Development and implementation of a training program for project personnel.
- Monitoring of excavation activities by a qualified paleontological monitor in areas identified as likely to contain paleontological resources. The monitor shall be equipped to salvage fossils and/or matrix samples as they are unearthed in order to avoid construction delays. The monitor shall be empowered to temporarily halt or divert equipment in the area of the find in in the event paleontological resources are discovered.
- Because the underlying sediments may contain abundant fossil remains that can only be recovered by a screening and picking matrix, these sediments shall occasionally be spot-screened through 1/8- to 1/20-inch mesh screens to determine whether microfossils exist. If microfossils are encountered, additional sediment samples (up to 6,000 pounds) shall be collected and processed.
- Preparation of recovered specimens to a point of identification and permanent preservation. This includes the washing and picking of mass samples to recover small invertebrate and vertebrate fossils and the removal of surplus sediment from around larger specimens to reduce the volume of storage for the repository and the storage cost for the developer.
- Identification and curation of specimens into a museum repository with permanent retrievable storage.

Preparation of a report of findings with an appended itemized inventory of specimens. When submitted to the Service, the report and inventory would signify completion of the program to mitigate impacts to paleontological resources.

4.2.4.3 Alternative C

Although an additional approximately 50,000 cubic yards of material would be removed from the western portion of the Otay River Floodplain Site under Alternative C, the potential to encounter paleontological resources, as described under Alternative B, remains low. However, to minimize the potential for any significant adverse effects to paleontological resources as a result of implementing Alternative C, similar to Alternative B, MM-PALEO-1 has been incorporated into the scope of Alternative C.

Mitigation Measures

MM-PALEO-1, as outlined for Alternative B, would also be implemented for this alternative. With the implementation of the measures in MM-PALEO-1, no significant impacts are anticipated.

4.2.5 Hydrology and Water Quality

This section addresses the direct and indirect impacts to hydrology and water quality due to implementation of the proposed alternatives. Analysis in this section is based on the hydrologic modeling and subsequent analysis in the following reports.

The conclusions from each of these reports are incorporated into the discussion below.

- *Tidal Hydraulics Analysis of the Otay River Estuary Restoration Plan*, prepared by Dr. Scott A. Jenkins Consulting in September 2014 (Appendix G)
- *Otay River Estuary Restoration Project Fluvial Hydraulics Study*, prepared by Everest International Consultants in April 2016 (Appendix H)
- *Sensitivity Analysis of Potential DDT Deposition in the Otay River Estuary Restoration Plan (ORERP) Post-100 Year and 50-Year Floods*, prepared by Scott Jenkins et al. in October 2015 (Appendix I)

4.2.5.1 100-Year Flood and Erosion

Significance Threshold: Impacts related to the alteration of fluvial flows through the project site would be considered significant if implementation of the proposed action on the floodplain would substantially increase the projected 100-year flood elevations upstream or downstream of the project site or would substantially alter flood flow velocities and associated erosional forces.

Flood and erosion impacts were evaluated by comparing hydrodynamics under existing and proposed conditions. Water levels and velocities were assessed using a numerical model to simulate tidal and fluvial conditions in the project area.

Flood impact analyses, which were conducted for all alternatives to assess the impacts of flooding associated with the 100-year flood, focused on changes to flow patterns and water elevations during flood conditions. The erosion impact analysis evaluated project-induced velocity changes as a surrogate for erosion (scour) potential. The two-dimensional hydrodynamic model TUFLOW, described in Appendix H, was selected to assess flood impacts because this model accounts for all the necessary analysis components—tidal fluctuations, flood flows, grading changes, water control structures (e.g., open channels, culverts, pipes, weirs), levees, and salt pond configurations.

Based on the Fluvial Hydraulics Study conducted by Everest International Consultants, soils at the project site that are composed of fine sand to coarse sand would begin to erode when water velocity reaches and exceeds 0.66 feet per second (ft/s). To evaluate potential erosion for this area under the 100-year flood, the areas on the Otay River Floodplain Site with maximum flood velocities higher than 0.66 ft/s were identified under existing conditions and proposed conditions (Appendix G; Appendix H).

4.2.5.1.1 Alternative A

Under existing conditions, the maximum water elevations on and surrounding the project site would follow the existing overall topography. Higher water elevations would occur along the upper elevations along the Otay River and decrease toward the lower elevations in the Otay River Floodplain Site and adjacent salt ponds. Additionally, the maximum water elevations would result in flood inundation along the Otay River and Otay River floodplain below the I-5 Bridge.

Using the TUFLOW model, flood conditions were simulated for the existing condition (Alternative A). The model results indicated that during a 100-year storm event, the Otay River floodplain and salt ponds would be inundated, as would some developed areas to the north, northeast, and south of the project site. More specifically, during a 100-year storm event, flood flows from the Otay River would enter the Otay River Floodplain Site beneath the I-5 Bridge and move along the river channel toward Ponds 50 and 51. Flows from Nestor Creek would move into the site along the eastern edge of the Otay River Floodplain Site. Floodwaters from Otay River and Nestor Creek would continue to increase and inundate the Otay River Floodplain Site, and eventually overtop the southern levees in the South Bay Salt Works facility. Floodwaters would first enter the salt pond area through Pond 51 and inundate the ponds. The floodwaters would fill Ponds 50–54 first and then continue moving into Ponds 41–43, 46, and 48. Farther downstream, flood flows would also overtop the Bayshore Bikeway and the levees at Ponds 20 and 22. At the bike path bridge near 13th Street, flows would split westward to San Diego Bay or south along the west side of the Otay River Floodplain Site.

According to the model, 3 hours after the arrival of the flood on the project site, floodwaters would continue to inundate the Otay River Floodplain Site, Pond 20, Pond 22, Ponds 40–48, and eventually Ponds 23–27. By 9 hours after the arrival of the flood, floodwaters would inundate the remaining ponds (Pond 12–15, 21, 26, and 28). Floodwaters would ultimately overtop the outer levees of the salt ponds and flow into San Diego Bay. Although these areas would be affected by 100-year flood flows, no changes to the project site are proposed under Alternative A; therefore, impacts would be considered less than significant.

Additionally, under existing conditions, hydraulic conditions along the Otay River are affected by a combination of tidal exchange with San Diego Bay and watershed flows from the Otay

River. The model indicates that the Bayshore Bikeway is subject to overtopping in the vicinity of Pond 20 during the 100-year storm event, as well as during flood events with return periods of between 10 and 15 years.

Another area subject to flooding during the 100-year flood event under existing conditions is a portion of the City of Imperial Beach located in the vicinity of Bayside Park (refer to Appendix H for additional details). It is in this location that an existing drainage channel connects to the Otay River north of the Bayshore Bikeway. Under existing conditions, the 100-year flood maximum elevation in this portion of the Imperial Beach would be +9.2 feet NAVD 88, which could result in the inundation of existing structures. The implementation of Alternative A would result in no changes to flood flows on the project site, and model projections for how flood events would affect the properties in and around the Otay River floodplain under current conditions would remain unchanged. Therefore, no significant impacts related to flood elevations would occur under Alternative A.

The 100-year flood modeling was also used to establish flood velocities under existing conditions. The maximum velocity reported is that which occurs at any time over a 36-hour simulation period (see Appendix H for greater detail). In general, under existing conditions, the highest velocities would occur in the Otay River channel. These higher velocities are predicted to occur along the entire length of the Otay River from the I-5 Bridge to San Diego Bay, with velocities ranging from about 7 to 10 ft/s. Similarly, high velocities attributed to the flood flows overtopping the salt pond levees during a 100-year flood event would occur along several of the salt pond levees, including the southern outer levees of Ponds 20, 22, and 23 and the internal levee between Ponds 22 and 23. Higher velocities are also predicted to occur along the outer levees of Ponds 14 and 15 due to overtopping of the levees. High velocities are also predicted in areas east of Nestor Creek. Based on the soil characteristics for the area, the soils are likely to erode under existing conditions during a 100-year flood (Appendix H). Although flooding and erosional activities due to 100-year flood events may result under Alternative A, no changes to the project site are proposed under Alternative A; therefore, impacts would be considered less than significant.

Mitigation Measures

No changes to the project site are proposed under Alternative A; therefore, no significant impacts related to changes in flood elevations or flow velocities are anticipated and no mitigation measures are required.

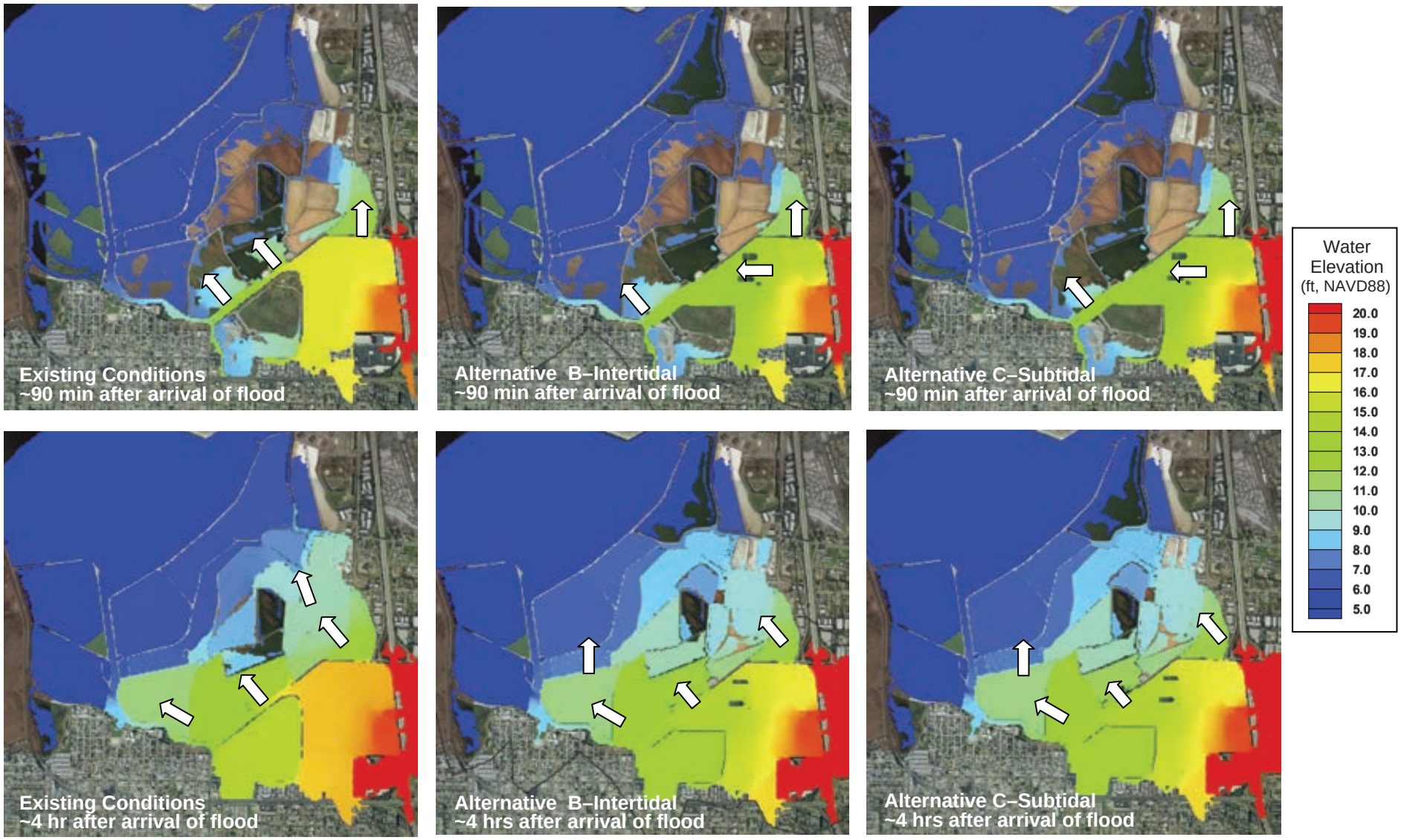
4.2.5.1.2 Alternative B

Flood Impacts: On-Site Flooding

Under Alternative B, the portion of the Otay River Floodplain Site located to the west of Nestor Creek would be lowered to support intertidal wetland and wetland-associated upland habitats by excavating approximately 320,000 cubic yards of soil from the site, of which approximately 260,000 cubic yards would be transported to and placed in the Pond 15 Site to raise the elevations to support tidal wetlands and other habitat. Excavated material not needed for the project would be stockpiled in an area east of Nestor Creek for future use by the Service. Another project feature that would affect flood flow through the Otay River Floodplain Site is the relocation of the existing levee along the north side of the site to the southern boundary of the Otay River Floodplain Site, as shown on Figure 2-1a.

Hydrologic modeling was conducted to assess flow patterns and water elevations for the site conditions proposed under Alternative B during a 100-year storm event. Modeling results indicate that flood elevations upstream of the I-5 Bridge would be the same as those predicted under existing conditions (Alternative A); therefore, the implementation of Alternative B would not result in significant impacts upstream of the I-5 Bridge (Appendix H).

For the area downstream of the I-5 Bridge, modeling of flow patterns and water elevations during a 100-year storm event indicate that existing flood patterns would be altered under Alternative B. Specifically, modeling results predict that the direction of flood flows during a 100-year flood event would change on the Otay River Floodplain Site. The redistribution of flood flow under Alternative B is illustrated in Figure 4.2-1, Comparison of 100-Year Floodwater Elevations. In this figure, water elevations are compared at two different times during the flood—approximately 90 minutes and 4 hours after arrival of the flood into the project area. The white arrows emphasize the general direction of flow. Under Alternative A, floodwaters would initially move through the Otay River channel, overtopping the levees at Ponds 51, 20, and 22 and flowing south along the western side of the Otay River Floodplain Site and filling it from the south. Under Alternative B, there would be no levee along the south side of the Otay River channel, allowing flood flows to move into the northern portion of the Otay River Floodplain Site, delaying the overtopping of Pond 20, while Ponds 51 and 22 would continue to be overtopped under this alternative.



SOURCE: EVEREST INTERNATIONAL CONSULTANTS, INC. 2016

FIGURE 4.2-1

Comparison of 100-year Flood Water Elevations

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The differences in the maximum 100-year flood elevation between the alternatives and existing conditions are illustrated in Figure 4.2-2, 100-Year Flood Impacts – Change in Maximum Water Elevations when Compared with Existing Conditions. The white areas indicate no change in maximum water elevation from existing conditions, while yellow areas indicate higher flood elevations under each alternative compared to the existing conditions. The highest increases in flood elevations would occur in Ponds 12–14 and 28. Lighter blue areas indicate reductions in flood elevations, which would primarily occur on the Otay River Floodplain Site due to habitat restoration and dredging of material associated with proposed action implementation. Reductions in flood elevations are also predicted to occur in the residential areas located south of the Otay River Floodplain Site in the vicinity of Palm Avenue between 18th Street and Saturn Boulevard. Flood elevations would also be reduced in the southeast portion of the Pond 15 Site. The darker blue areas in Figure 4.2-2 indicate areas that are flooded under existing conditions but would no longer be flooded under Alternative B, including much of the Pond 15 Site. In general, Alternative B would not affect flood elevations in existing tidally influenced areas of the Bay, including the recently restored western salt ponds (Ponds 10A, 10, and 11). Flood elevations would, however, increase in a number of the salt ponds, as illustrated in Figure 4.2-2.

Although flooding would increase in these areas and on the Otay River Floodplain Site (on-site flooding), this increase in flooding would not adversely affect sensitive areas such as urban development (e.g., residences, schools, and other sensitive urban uses) and would not adversely affect any other environmental resources on site. Therefore, impacts associated with on-site flooding during the 100-year storm event would be less than significant.

Flood Impacts: Bayshore Bikeway

Implementation of Alternative B would also alter the maximum 100-year flood elevation in the vicinity of the Bayshore Bikeway. As shown in Figure 4.2-3, 100-Year Flood Impacts Along Bayshore Bikeway under Alternatives B and C, the yellow area indicates higher flood elevations as compared to existing conditions along the Bikeway, while blue areas indicate lower flood elevations. In general, the 100-year flood elevations would decrease in the area that parallels Ponds 20 and 48, but would increase along that portion of the bike path that parallels Pond 22. Although changes in flood elevations along the Bayshore Bikeway would result from the implementation of Alternative B, as illustrated in Figure 4.2-3, the Bayshore Bikeway would be subject to overtopping during a 100-year storm event under all alternatives, including Alternative A (existing conditions); therefore, impacts associated with flooding along the Bayshore Bikeway would not be considered significant following implementation of Alternative B. Additionally, the proposed action would include installation of channel protection along this portion of the Bayshore Bikeway to reduce erosion impacts associated with flooding, denoted as Project Feature (PF) 2 on Figure 2-1a. Implementation of this project feature would ensure impacts to the Bayshore Bikeway would remain less than significant.

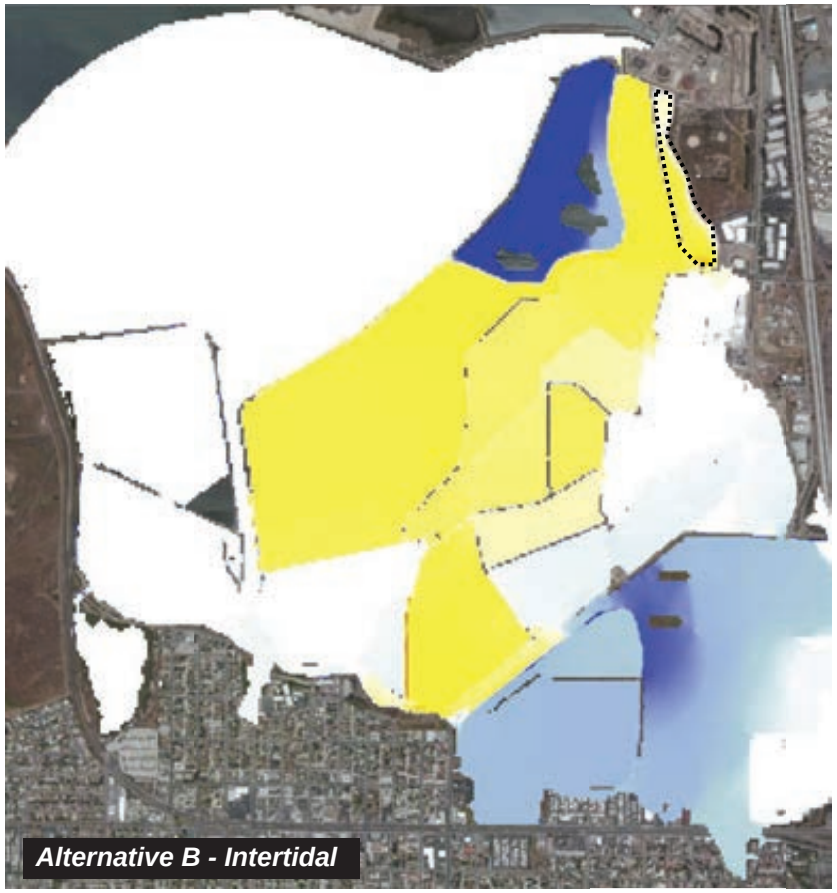
Figure 4.2-4, 15-Year and 100-Year Flood Elevations along Bayshore Bikeway, also provides flood elevations for the 15-year flood event at three points along the bike path. Water levels above the black dashed line indicate when and where overtopping is predicted to occur. No flooding is anticipated to occur for the 15-year flood event at Location 1, while at Locations 2 and 3, flood elevations are reduced under Alternative B over existing conditions resulting in a beneficial impact. In summary, Alternative B would not alleviate flooding of the Bayshore Bikeway during extreme flood events (e.g., 100-year flood), but would reduce flooding of the bike path for smaller and more frequent flood events (e.g., 15-year flood), thus resulting in a beneficial impact during smaller flood events (see Figure 4.2-4). As previously described, implementation of the channel protection is included as part of the project scope under Alternative B, which would ensure that impacts to the Bayshore Bikeway following implementation of Alternative B remain less than significant during the 100-year storm event (also see discussion of erosion impacts).

Flood Impacts: Bayside Park—Imperial Beach

In addition to the effects of post-action flooding as described previously, the results of the hydrologic modeling indicated that flooding is expected in an area located south of the Otay River in the vicinity of Bayside Park in Imperial Beach under existing conditions and under Alternative B (see Figure 4.2-2). During a flood, floodwaters would be conveyed to the Bayside Park area via an existing storm drain constructed under the Bayshore Bikeway to the south of Pond 23, as well as overtopping the bikeway. At the location of the Bayside Park area, the model indicates that the maximum water elevation during a 100-year storm under existing conditions is 9.2 feet NAVD 88. Following implementation of Alternative B, the model indicates a maximum water elevation in the Bayside Park area would be 9.4 feet NAVD 88. Therefore, the model anticipates an increase of 0.2 feet in flood elevation under Alternative B (Appendix H).

A fluvial analysis modeling conducted for the Bayside Park area was used to evaluate various options for reducing the predicted increase in floodwater elevations in the Bayside Park area associated with implementation of Alternative B. The results of this analysis indicated that raising of the top of the levee between Ponds 22 and 23 by 2 feet, from an elevation of approximately 11 feet to 13 feet NAVD 88, would divert flood flows away from the Bayside Park area and toward the northern salt ponds. With the implementation of this action, the model indicates that the maximum water elevation during the 100-year flood would drop to 9.1 feet NAVD 88, which is 0.1 feet lower than predicted under existing conditions (Appendix H).

To avoid any increase in the maximum water elevation in the Bayside Park area during the 100-year flood, increasing the elevation of the levee between Ponds 22 and 23 by 2 feet has been included as a project feature to the proposed action, as described in Chapter 2, Alternatives, and illustrated on Figure 2-1a (Project Feature (PF) 13). Implementation of this project feature would ensure that impacts to the Bayside Park area would remain less than significant following implementation of Alternative B.



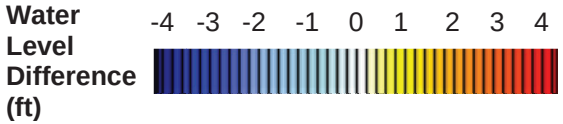


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FIGURE 4.2-2

100-Year Flood Impacts–Change in Maximum Water Elevations when Compared with Existing Conditions

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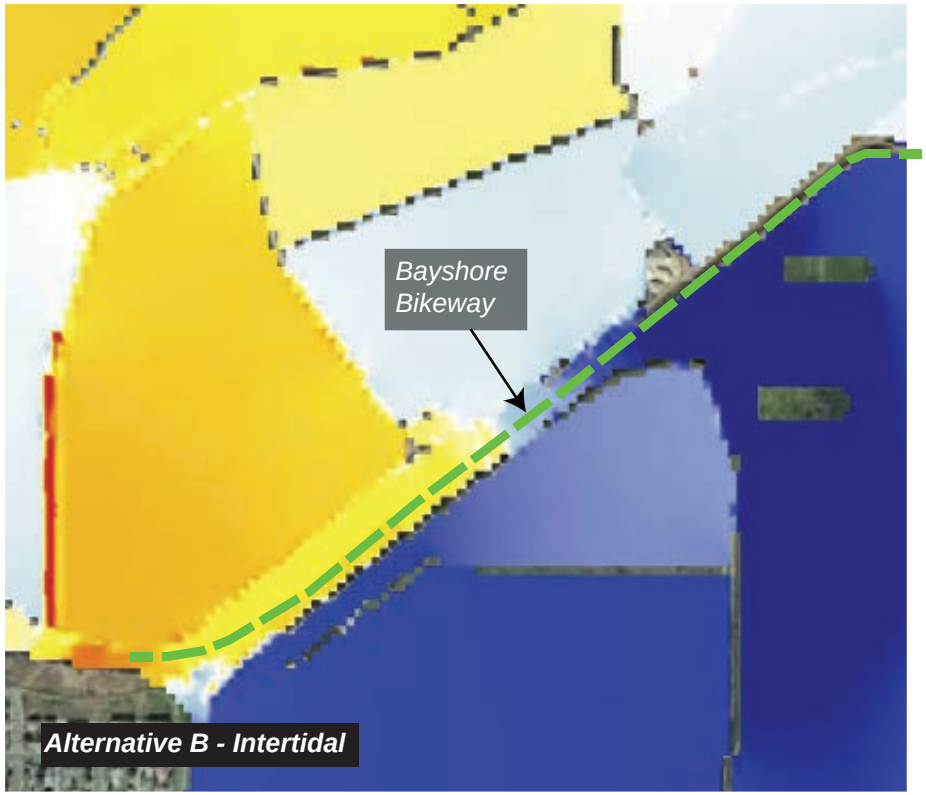

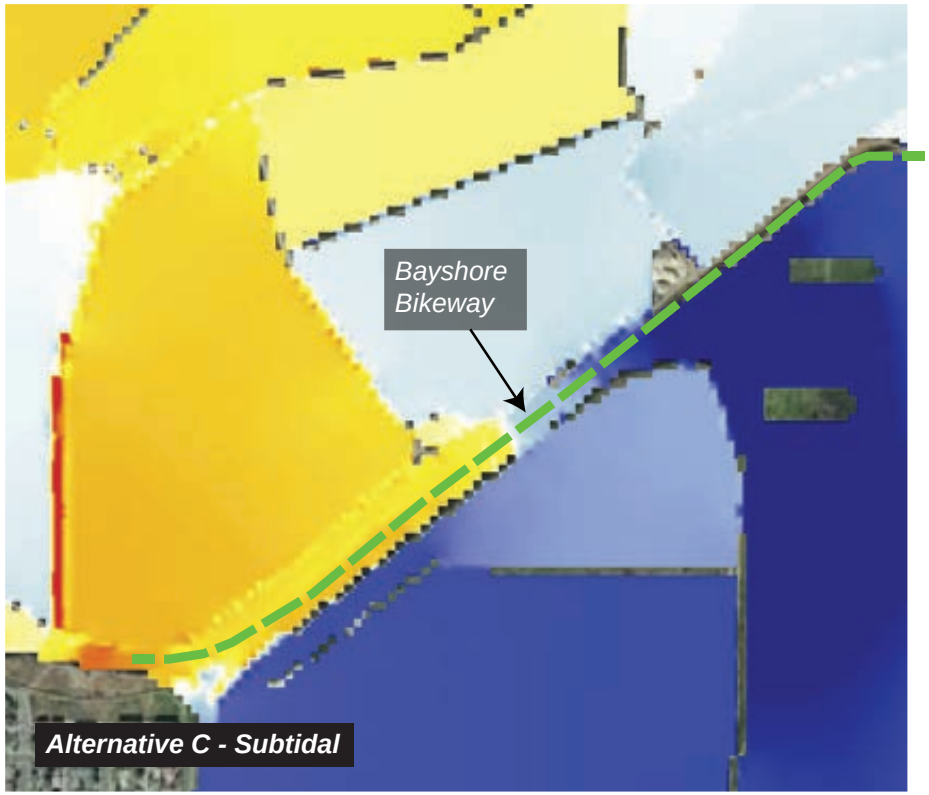

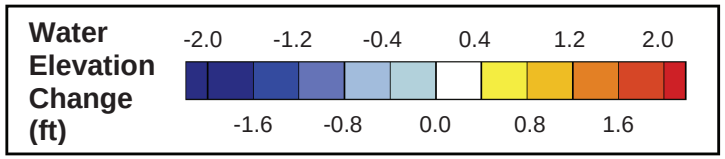

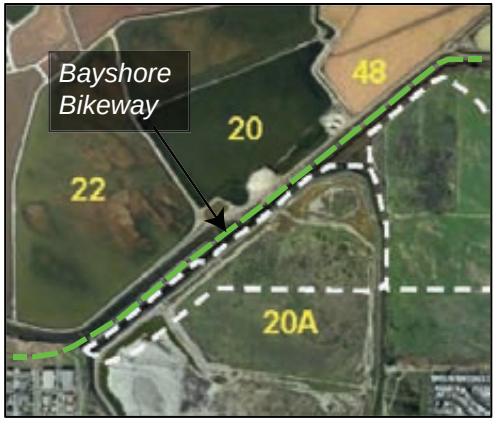

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FIGURE 4.2-3

100-Year Flood Impacts Along Bayshore Bikeway Under Alternatives B and C

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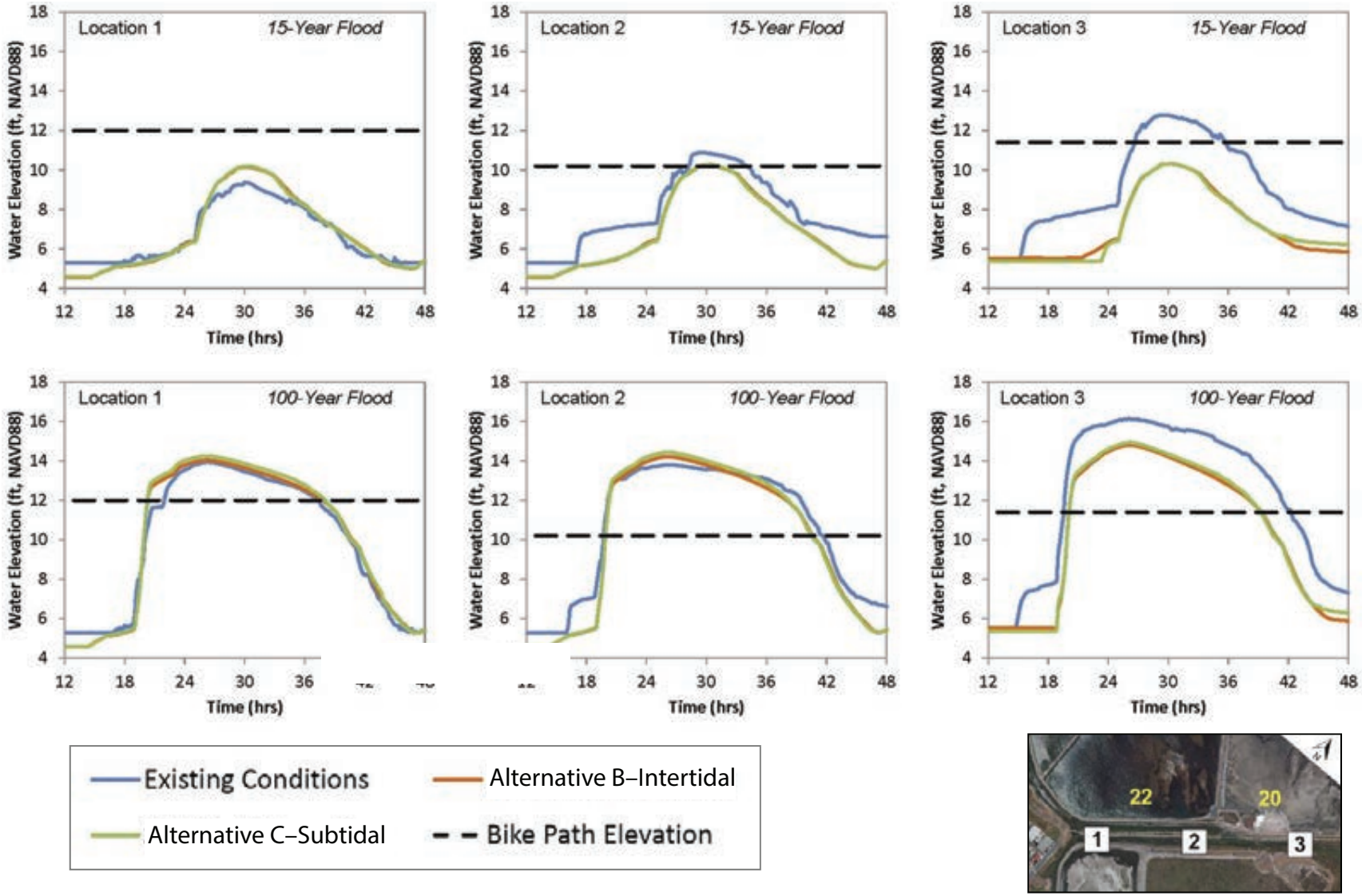

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FIGURE 4.2-4

15-Year and 100-Year Flood Elevations along Bayshore Bikeway

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Erosion Impacts

Hydrologic modeling was also used to predict potential impacts related to erosion, or scour, as a result of implementation of Alternative B. Erosion of sediment is dependent primarily on the water velocity and sediment grain size. In general, higher velocities correspond with greater erosional activity. For this analysis, erosion impacts were qualitatively assessed based on changes in velocities from the existing conditions (Alternative A) to conditions proposed under Alternative B. A comparison of maximum water velocities under Alternative A and Alternative B during a 100-year flood event is presented in Figure 4.2-5, Comparison of 100-Year Flood Maximum Velocities for Intertidal Alternative. As shown, under both Alternative A and Alternative B, the highest velocities predicted would occur along the Otay River channel and adjacent levees. Modeling results show that in the upper portion of the Otay River east of the I-5 Bridge, implementation of Alternative B would not increase the existing rate of erosion upstream of the I-5 Bridge during a 100-year flood event based on change in water velocities.

A comparison of maximum flood velocities downstream of the I-5 Bridge indicate that flood velocities under Alternative B are similar in magnitude to Alternative A, but the locations of higher and lower velocities are different under the two alternatives. The differences in flood velocities between the existing and proposed condition under Alternative B are due to the changes in elevation that would occur due to proposed grading under Alternative B. Differences in flood velocities would occur along the Bayshore Bikeway adjacent to Ponds 48, 20, and 22, coinciding with differences in flood elevations. Along this portion of the Bayshore Bikeway, flood flow velocities would be higher under Alternative B than under Alternative A; therefore, the potential for slope erosion along the bikeway is also higher in this area than under existing conditions. Erosion along the Bayshore Bikeway would be less than significant following implementation of Alternative B because PF 2 has been included as part of the proposed action scope, which would include the installation of channel protection along this portion of the bike path to reduce bank erosion and ensure flood velocities would be reduced to below 0.6 ft/s.

Other areas that would experience high velocities include the area between the proposed stock pile areas, areas around Pond 15, and Ponds 12 and 14. Under Alternative A, higher velocities are predicted to occur at the outer levee of Pond 15 due to overtopping, while under Alternative B, lower velocities would occur along this levee due to the presence of the new tidal inlet at Pond 15. The inlet proposed as part of the proposed action would eliminate the potential for overtopping in Pond 15. The velocities of waters overtopping Ponds 12 and 14 are, however, predicted to be higher under Alternative B than under existing conditions. To reduce impacts associated with erosion during construction and following completion of the proposed action, including potential erosion impacts associated with the staging area and stockpiles, MM-VIS-1, MM-GEO-1, and MM-GEO-2 are provided. Implementation of these mitigation measures would

reduce impacts associated with erosion to less than significant. Additionally, no changes in flow velocities are predicted for the recently restored western salt ponds under Alternative B.

Regarding the area east of Nestor Creek, modeling results indicate that Alternative B would result in an increase in flood velocities in the area east of Nestor Creek when compared to Alternative A. To evaluate potential erosion for this area under the 100-year flood, the areas with maximum flood velocities higher than 0.66 ft/s were identified under Alternative A (existing conditions) both Alternative B and Alternative C as shown on Figure 4.2-6, Existing and Proposed 100-Year Flood Maximum Velocity. Under both existing conditions and Alternative B, the entire area east of Nestor Creek is predicted to experience maximum flood velocities equal to or greater than 0.6 ft/s; therefore, under either alternative, increased erosion in this area would occur during a 100-year flood event. To reduce flood velocities at this location, revegetation east of Nestor Creek is included as part of the scope of the proposed action, as shown on Figure 2-1a (see PF 14).

As part of this project feature, the area east of Nestor Creek would be planted with appropriate native vegetation to increase friction to slow down the flow. The appropriate frictional force required is determined by estimating the Manning's Roughness Coefficient, which represents the appropriate resistance to flood flows in channels and floodplains needed to reduce flood velocity impacts to a level that is less than significant. The hydrologic modeling conducted for the proposed action determined that a Manning's Coefficient of 0.15 is required to provide adequate frictional force to slow down flood velocities in this area (Appendix H). The Manning's formula is represented as follows:

$$\mathbf{V} = \frac{\mathbf{1.49}}{\boldsymbol{n}} \mathbf{R_h}^{\mathbf{2/3}} \mathbf{S_e}^{\mathbf{1/2}}$$

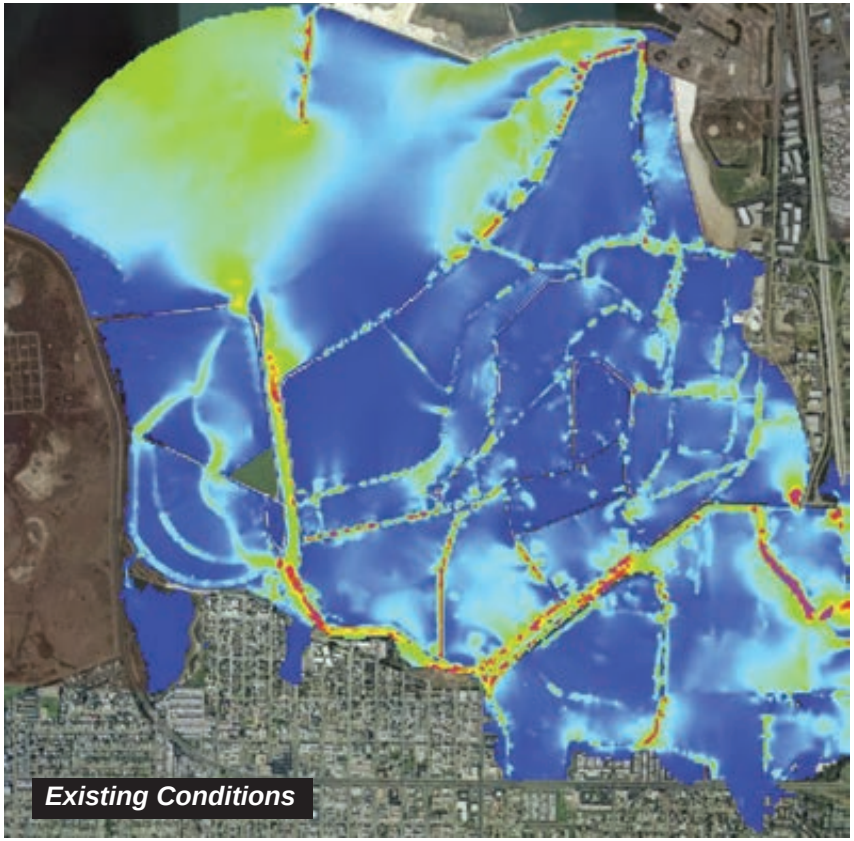
where:

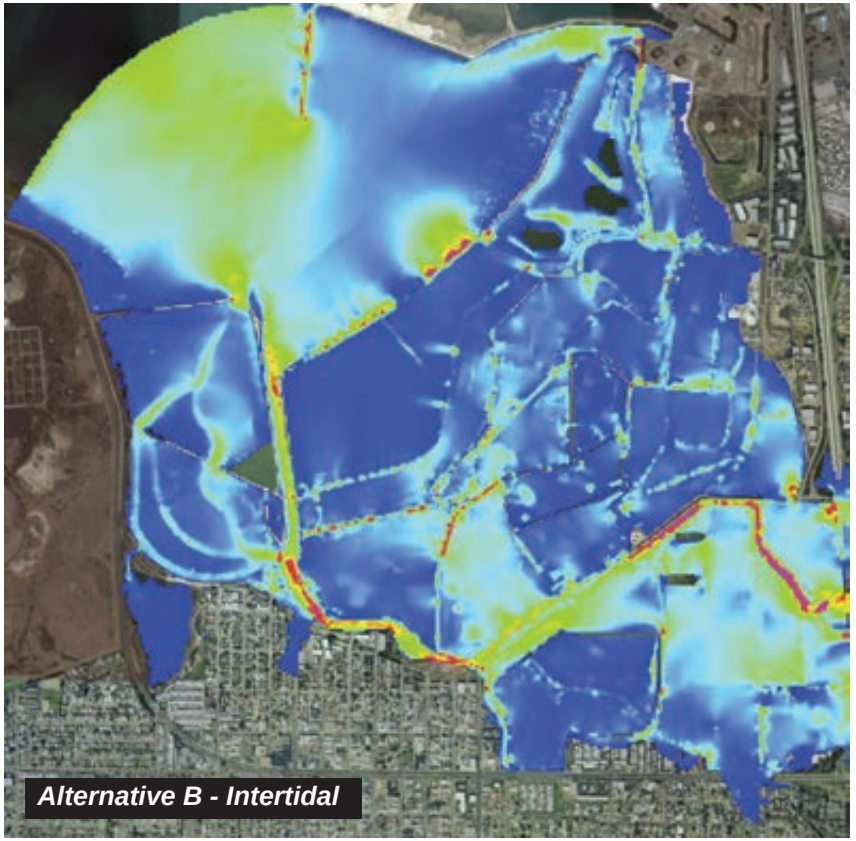
V = mean velocity of flow, in meters per second

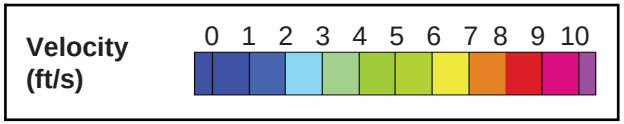
R_h = hydraulic radius, in meters

S_e = slope of energy or hydraulic grade line, in meters per meter

n = Manning's Roughness Coefficient







SOURCE: EVEREST INTERNATIONAL CONSULTANTS, INC. 2016

FIGURE 4.2-5

Comparison of 100-Year Flood Maximum Velocities for Intertidal Alternative

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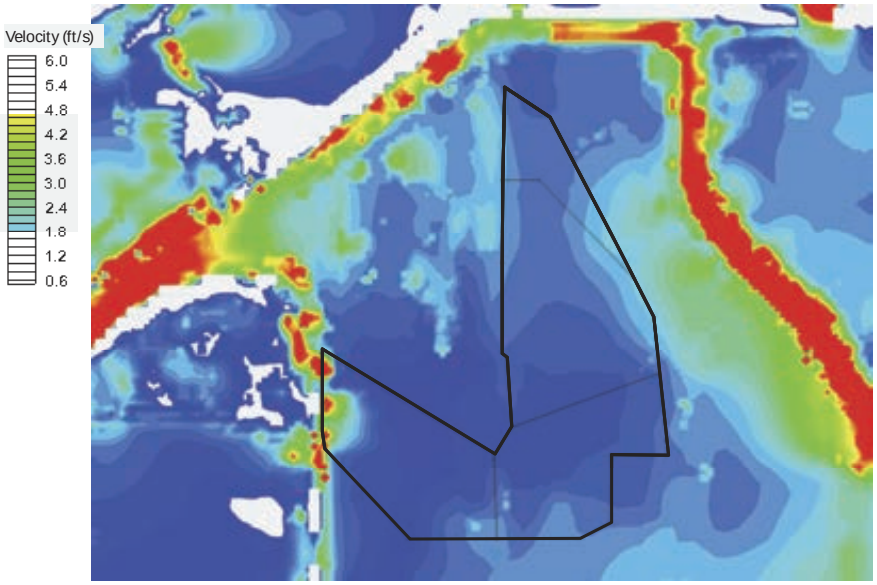
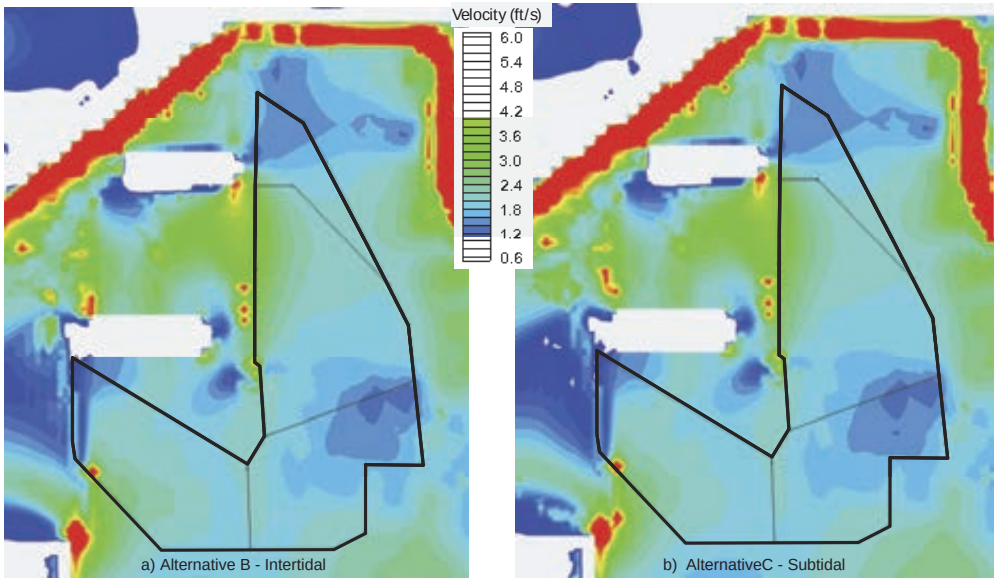


Area with 100-Year Flood Maximum Velocity Greater than 0.6 ft/s under Existing Conditions



Area with 100-Year Flood Maximum Velocity Greater than 0.6 ft/s under Proposed Conditions

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SOURCE: EVEREST INTERNATIONAL CONSULTANTS, INC. 2016

FIGURE 4.2-6

Existing and Proposed 100-Year Flood Maximum Velocity

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As previously stated, the location of this revegetation effort is identified on Figure 2-1a as PF 14. In addition to increasing friction, the roots of the vegetation would help bind the soil, making it less erodible. Revegetation of the area east of Nestor Creek (PF 14 on Figure 2-1a) would increase the Manning's Roughness Coefficient to 0.15 from 0.05 in this portion of the Otay River Floodplain Site, thus decreasing (slowing) flood velocities under Alternative B to velocities resembling those estimated under Alternative A (i.e., existing conditions). For the area adjacent to Nestor Creek, the maximum velocities under Alternative B would still be slightly higher than those under existing conditions following implementation of this project feature; however, this slight increase in velocities would not result in a potentially significant impact because the increase would be minimal and the resulting velocities would resemble those occurring under existing conditions. Therefore, following implementation of Alternative B, including the project feature that would consist of the revegetation of the area east of Nestor Creek, impacts associated with flood velocities and associated erosion at this location would be less than significant.

For smaller flood events (i.e., flood events other than the 100-year flood event), the model indicates that under Alternative B, maximum velocities would be less than 0.6 ft/s for almost the entire Otay River Floodplain Site during the 5-year and 10-year flood event (Appendix H).

In summary, under Alternative B, increased erosion on the Otay River Floodplain Site is predicted during the 100-flood event, but erosion would potentially decrease over existing conditions during the more frequent, smaller flood events. The overall potential impact of Alternative B on erosion across the Otay River Floodplain Site is likely to be small to negligible across the range of flood events that would be expected to occur within a 100-year period. Project features including channel protection along the Bayshore Bikeway, increasing the height of the levee between Ponds 22 and 23, and revegetation east of Nestor Creek have been included as part of the proposed action to ensure that impacts associated with flooding and erosion would be less than significant. Other impacts associated with post-action flooding and erosion in and around the site, including at the staging area and stockpile locations as described previously, would be considered potentially significant; therefore, MM-VIS-1, MM-GEO-1, and MM-GEO-2 have been incorporated into the scope of the project under Alternative B to reduce impacts associated with flood velocities and erosion at the staging area and stockpile locations to less than significant.

Mitigation Measures

With the incorporation of MM-VIS-1 (as described in Section 4.2.1) and MM-GEO-1 and MM-GEO-2 (as described in Section 4.2.2) into the scope of the project, impacts associated with flood velocities and erosion at the staging area and stockpile locations would be reduced to less than significant.

4.2.5.1.3 Alternative C

Flood Impacts: On-Site Flooding

Similar to Alternative B, Alternative C proposes excavation in the portion of the Otay River Floodplain Site located to the west of Nestor Creek; however, Alternative C includes a combination of intertidal and subtidal habitat, which would require additional excavation on the Otay River Floodplain Site. An estimated 370,000 cubic yards of material would be excavated from the site, of which approximately 310,000 cubic yards would be transported to and placed in the Pond 15 Site to raise the elevations to support tidal wetlands and other habitat.

Modeling of flow patterns and water elevations for the site conditions proposed under Alternative C are similar to Alternative B. Flood elevations along the Otay River upstream of the I-5 Bridge are the same for Alternative C as for Alternative A. Therefore, Alternative C would not significantly impact flood conditions upstream of the I-5 Bridge.

For the area downstream of the I-5 Bridge, modeling of flow patterns and water elevations during a 100-year storm event indicate that flooding patterns under Alternative C would be very similar to those described for Alternative B, as shown on Figure 4.2-1. Comparisons between Alternative B and Alternative C show similar flood impacts in the salt ponds for both alternatives (refer to Figure 4.2-2), although the flood elevations in some ponds would be slightly higher under Alternative C. For example, the 100-year flood elevation under Alternative C would overtop the Pond 28 levee, while no overtopping of that levee would occur under Alternative B. Although overtopping of this levee would occur under Alternative C and flooding would increase in these areas and on the Otay River Floodplain Site (on-site flooding), overtopping of levees and increases in flooding would not adversely affect sensitive areas such as urban development (e.g., residences, schools, and other sensitive urban uses) and would not adversely affect any other environmental resources on site. Therefore, impacts associated with on-site flooding during the 100-year storm event would be less than significant.

Flood Impacts: Bayshore Bikeway

Flood flow velocities under Alternative C would be similar in magnitude to Alternative B, but the locations of higher and lower velocities would vary between the two alternatives. Additionally, similar to Alternative B, differences in flood velocities would be apparent throughout the Otay River Floodplain Site due to a lowering of the existing elevations to achieve desired habitat types under Alternative C. Higher velocities would occur along the Bayshore Bikeway that could result in erosion of the Bikeway's southern embankment. PF 2, which would include installation of channel protection in this area, is included in the scope of the proposed action and would ensure that impacts associated with flooding and erosion at the Bikeway would remain less than significant following implementation of Alternative C.

Flood Impacts: Bayside Park—Imperial Beach

In addition to the effects of post-action flooding as described previously, the results of the hydrologic modeling indicated that flooding is expected in an area located south of the Otay River in the vicinity of Bayside Park in Imperial Beach under existing conditions and under Alternative C. To avoid any increase in the maximum water elevation in the Bayside Park area during the 100-year flood, increasing the elevation of the levee between Ponds 22 and 23 by 2 feet has been included as a project feature to the proposed action, as described in Chapter 2 and illustrated on Figure 2-1a (PF 13). Implementation of this project feature would ensure that impacts to the Bayside Park area would remain less than significant following implementation of Alternative C.

Erosion Impacts

In addition to flooding-related impacts as described previously, high velocities would occur between the stockpile areas and area east of Nestor Creek. To reduce flood velocities east of Nestor Creek, revegetation of this area is included as part of the scope of the proposed action as shown on Figure 2-1a (see PF 14). Following implementation of Alternative C, including the project feature that would consist of the revegetation of the area east of Nestor Creek, impacts associated with flood velocities and associated erosion would be less than significant.

Other impacts associated with post-action flooding and erosion in and around the site including at the staging area and stockpile locations, as described previously, would be considered potentially significant. To reduce impacts associated with erosion of soils at the staging area and stockpiles, MM-VIS-1, MM-GEO-1, and MM-GEO-2 would be incorporated into the scope of the project under Alternative C. Following implementation of these measures, impacts at these locations would be less than significant.

Mitigation Measures

Implementation of MM-VIS-1 (as described in Section 4.2.1) and MM-GEO-1 and MM-GEO-2 (as described in Section 4.2.2) would reduce impacts to less than significant.

4.2.5.2 Tidal Flow

Significance Threshold: Impacts related to the alteration of tidal flows would be considered significant if projected tidal velocities following project implementation would result in measurable scour of existing tidal channels or mudflats, or could jeopardize the stability of, or increase the maintenance requirements for, adjacent levees, levee breaches, bridge pilings, or other facilities.

To assess impacts to hydrology associated with implementation of the proposed action, hydrodynamic simulations of the tidal exchange that would occur on both the Otay River Floodplain Site and the Pond 15 Site were prepared (Appendix G). It should be noted that the analysis provided in this section addresses dry weather tidal behavior only. Tidal velocities and associated impacts during wet weather are addressed in Section 4.2.5.1, 100-Year Flood and Erosion. The simulations conducted for this analysis demonstrate tidal flow velocities and the stability and potential maintenance requirements of the Otay River channel that would connect the proposed tidal basin on the Otay River Floodplain Site with San Diego Bay. This study employed hydrodynamic modeling using a research model and a littoral transport model, TIDE_FEM, to evaluate the tidal hydraulics of the action alternatives based on updated bathymetry (depth measurements) provided by Wetlands Research Associates and latest updates to San Diego Bay tides for the 1983–2001 tidal epoch. The detailed technical approach for the modeling software and assumptions are outlined in Appendix G.

4.2.5.2.1 Alternative A

Hydrodynamic simulations of the tidal exchange on the project site under existing conditions focused on peak tidal flooding and ebbing currents during spring tides. Results indicate that flooding associated with spring tidal currents are about 0.1 meters per sec (m/sec) (0.33 ft/sec) at the river mouth and then accelerate to 0.18 m/sec (0.59 ft/sec) in the deeper sections of the inlet channel (north/south reach of the Otay River adjacent to restored Ponds 10 and 11). Further up-river, currents reach 0.15 m/sec (0.50 ft/sec) in the narrower east/west reach near the railroad bridge. Flood tide currents then decelerate to less than 0.01 m/sec (0.03 ft/sec) in the upper reaches of the floodplain (Appendix G).

The tidal currents calculated in the lower Otay River and feeder channel during spring tides were compared against soils present in the area to estimate the potential for scour and erosion in these channels under existing conditions. This comparison revealed that the Otay River channel sediments have a threshold scour speed of 0.2 m/sec (0.66 ft/sec). Tidal current speeds between 0.08 m/sec (0.27 ft/sec) and 0.2 m/sec (0.66 ft/sec) would lead to bed-load transport (the movement of rocks, sediment, and particles along the channel bottom) but not erosion. Erosion and scour would only occur for tidal currents that exceed 0.2 m/sec (0.66 ft/sec), while currents less 0.08 m/sec (0.27 ft/sec) would result in deposition (the addition of rocks, sediment, and particles to an area).

The transport thresholds of the native riverbed sediments indicate that the only potentially problematic reaches of the channel are (1) the north/south reach of channel adjacent to restored Ponds 10 and 11 and (2) two locations (referred to as “pinch points”) near the railroad bridge where a series of humps, shoals, and scour holes are found in the river bathymetry. In the north/south reach adjacent to restored Ponds 10 and 11, the channel is generally narrow and deep

and has already scoured to an equilibrium depth where maximum tidal currents reach, but do not exceed, the threshold scour speed of the channel sediments. At the two identified locations near the railroad bridge, maximum tidal currents approach, but do not exceed, the sediment incipient scour speeds. Under these conditions, tidal erosion does not occur since the sedimentary bed remains in a steady state of bed-load transport. Thus, a stable, quasi-equilibrium channel is maintained under existing conditions, including a sediment transport pattern that results in neither erosion nor deposition.

One advantageous attribute of this site is that the inlet channel and the mouth of the Otay River are not subject to coastal transport by ocean waves, because the southern portion of the San Diego Bay is sheltered from high-energy shoaling swells. Consequently, the inlet channel to the Otay River Floodplain Site is not likely to infill or close from sand influx from incoming water, making the site significantly easier to maintain (Appendix G).

Under Alternative A, the hydraulic conditions on the project site would remain unchanged; therefore, no significant impacts related to tidal hydrology would occur.

Mitigation Measures

No significant impacts are anticipated under Alternative A; therefore, no mitigation measures are required.

4.2.5.2.2 Alternative B

Figures 4.2-7, Alternative B – Flood Tide Progressive Flow at Mean High Water, and 4.2-8, Alternative B – Ebb Tide Progressive Flow at Mean Low Water, show the flow trajectories and depth-averaged tidal currents for Alternative B as computed by the calibrated TIDE_FEM model during spring flooding tides and spring ebbing tides, respectively. As noted in the Tidal Hydraulic Analysis conducted for the proposed action, these data were collected on September 18, 2009 (Appendix G). Velocities of tidal currents are portrayed according to the color-coded velocity scale appearing in the lower left corner of the figures.

Tidal Flows at the Otay River Mouth and into the Tidal Basin

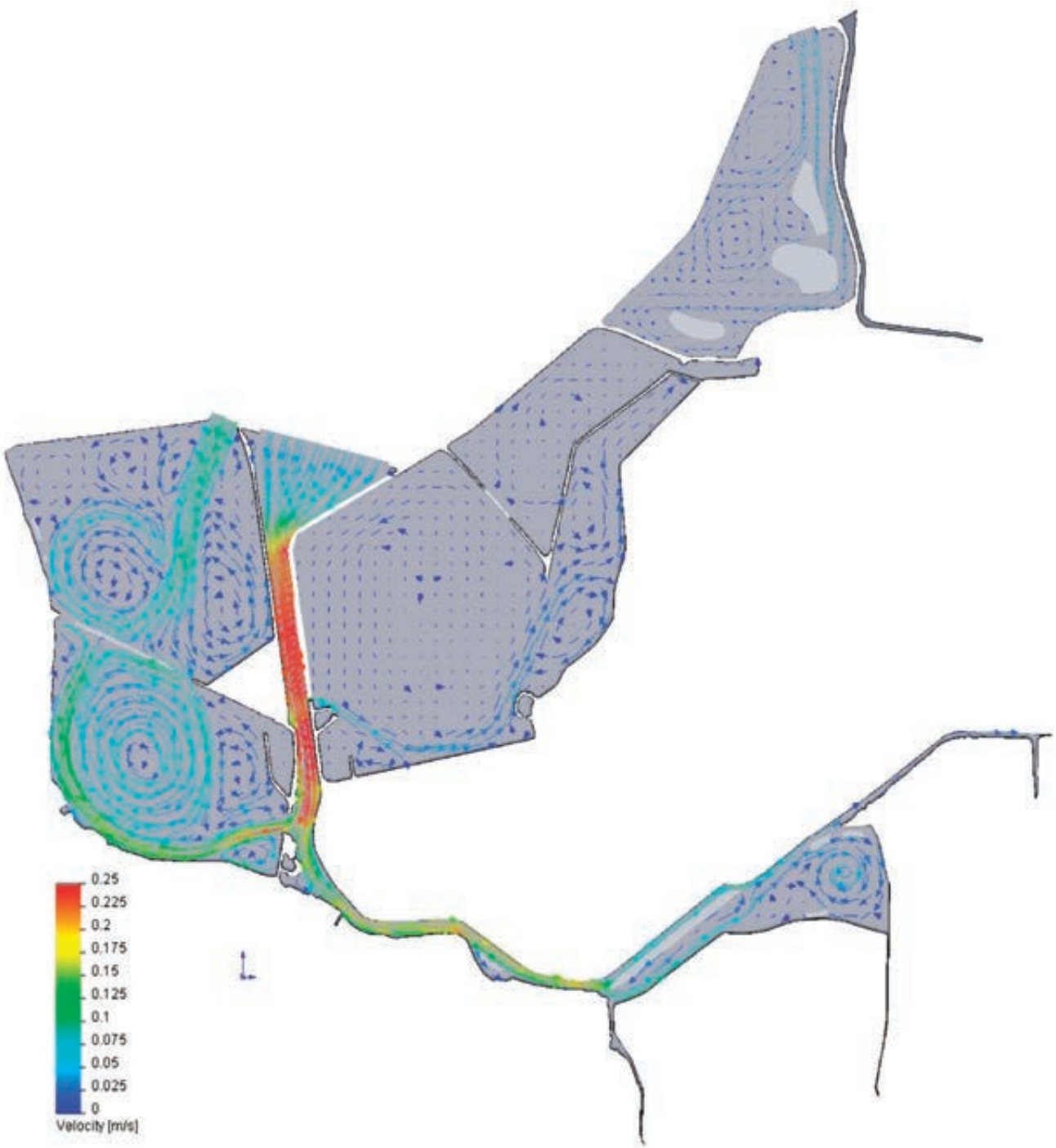
Based on the model, maximum flooding spring tidal currents under Alternative B at the mouth of the Otay River are about 0.10 m/sec (0.33 ft/sec), and then accelerate in the narrower north/south reach of the channel adjacent to Ponds 10 and 11 to 0.2 m/sec (0.66 ft/sec), which is slightly higher than under existing conditions. As described previously under Alternative A, tidal current speeds of 0.2 m/sec (0.66 ft/sec) would lead to bed-load transport but not erosion.

After passing Pond 10, currents would decelerate and then increase to 0.17 m/sec (0.55 ft/sec) near the two pinch points at the railroad bridge, before entering the floodplain tidal basin. The model indicated that tidal currents entering the tidal basin would initially form a well-defined jet at the west bank with speeds of about 0.08 m/sec (0.26 ft/sec). This entry jet would quickly diverge into a complex set of clockwise rotating eddies that would occupy the interior of the tidal basin, as shown in Figure 4.2-7. Eddy speeds in the tidal basin would be approximately 0.02 m/sec (0.07 ft/sec). These speeds would be insufficient to transport fine sand, but they would be an important stirring mechanism for mixing the tidal basin water mass to maintain high oxygen levels and to sustain fine silt- and clay-sized sediment particles in suspension.

Tidal current speeds at the mouth of the Otay River under Alternative B throughout an entire spring/neap tidal cycle, as predicted by modeling, are expected to reach a maximum flood flow velocity of 0.10 m/sec (+0.33 ft/sec), while the maximum ebb flow velocity at the river mouth would reach −0.09 m/sec (−0.29 ft/sec). Ebb tide flows are described in negative velocities, while positive velocities are used to describe flood tide flows. At these velocities, the Otay River mouth would be neither depositional nor erosional under Alternative B; therefore, impacts would be less than significant (Appendix G).

Tidal Flows at the Otay River Floodplain Site

Figure 4.2-7 illustrates flood tide flows under Alternative B, and Figure 4.2-8 illustrates the flow trajectories and depth averaged tidal currents for Alternative B based on model calculations during a spring ebbing tide. Based on the modeling results, the wetted area of the Otay River Floodplain Site tidal basin would be substantially reduced relative to the existing condition flood tide area, due to a grading plan that allows for almost complete drainage at mean low water tidal stages. Tidal waters would drain from the basin at very low speeds (approximately −0.01 m/sec (−0.03 ft/sec)). This feeder current would evacuate the tidal basin and then accelerate to −0.05 m/sec (−0.16 ft/sec) as it passes through the pinch point under the railroad bridge in the narrow east/west reach of channel. Ebb flow in the channel would then accelerate further to −0.09 m/sec (−0.29 ft/sec) in the deeper north/south reach before discharging into San Diego Bay. Impacts associated with tidal behavior at the Otay River Floodplain Site would be considered less than significant because velocities would not result in substantial erosion or sedimentation at the site.



Intertidal Alternative flood tide progressive vector flow simulation at Mean High Water (MHW), where vector trajectories are plotted over 30 minute time integrations.

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SOURCE: DR. SCOTT JENKINS CONSULTING 2014

FIGURE 4.2-7

Alternative B–Flood Tide Progressive Flow at Mean High Water

Otay River Estuary Restoration Project EIS

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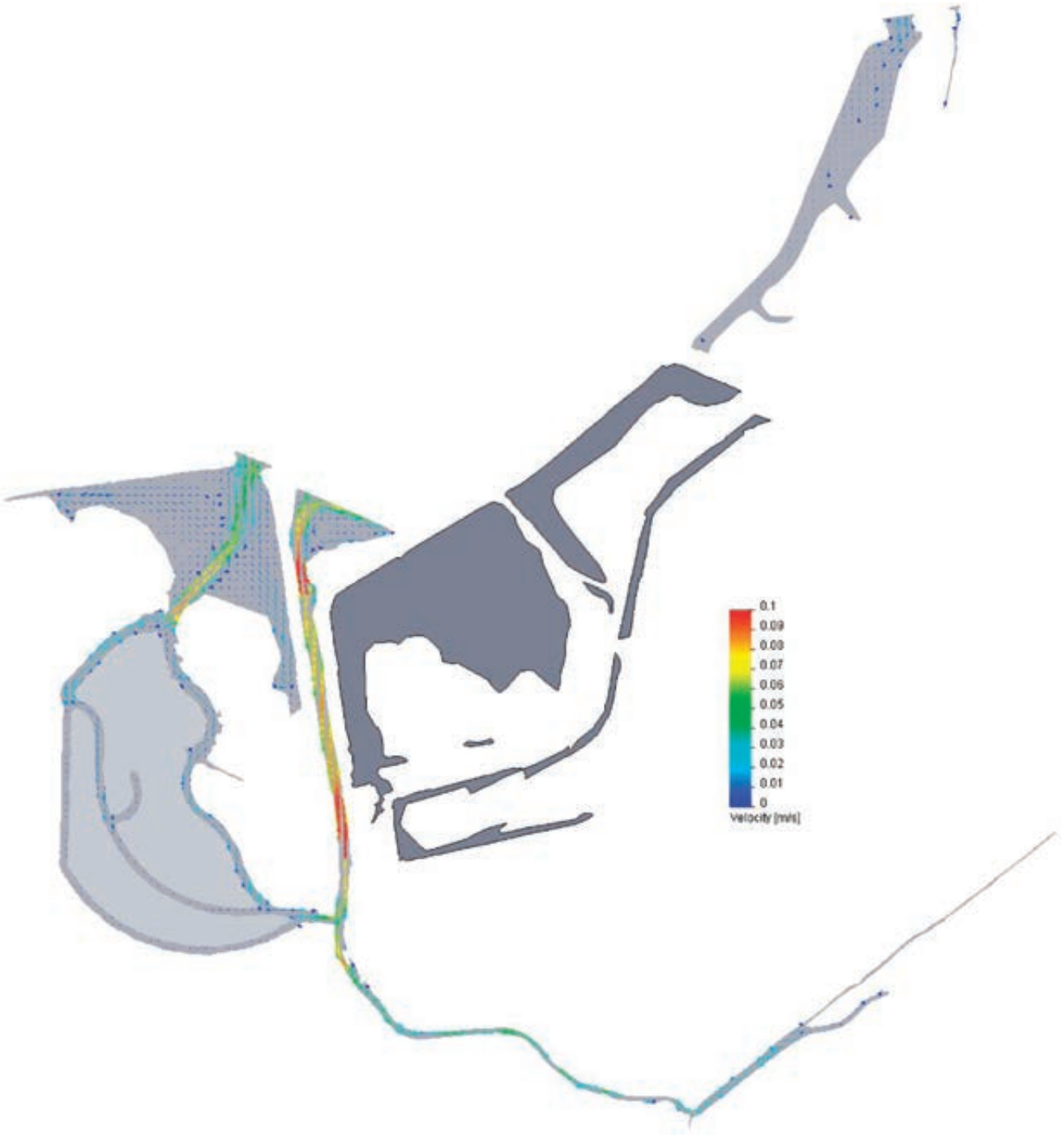

Intertidal Alternative ebb tide progressive vector flow simulation at Mean Low Water (MLW), where vector trajectories are plotted over 30 minute time integrations.

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SOURCE: DR. SCOTT JENKINS CONSULTING 2014

FIGURE 4.2-8

Alternative B–Ebb Tide Progressive Flow at Mean Low Water

Otay River Estuary Restoration Project EIS

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Tidal Flows at the Pond 15 Site

Maximum flooding spring tidal currents in the inlet channel to the Pond 15 Site would be about 0.07 m/sec (0.22 ft/sec) and then decelerate as a weak entry jet with speeds of about 0.05 m/sec (0.16 ft/sec). This entry jet would also quickly diverge into a complex set of counter rotating eddies that populate the interior of the Pond 15 tidal basin. Eddy speeds in the Pond 15 tidal basin would be approximately 0.01 m/sec (0.03 ft/sec), insufficient to transport fine sand or cohesive silts, but still providing a stirring mechanism for mixing the Pond 15 Site water mass to maintain high oxygen levels and to sustain suspension of fine silt- and clay-sized sediment particles.

In the Pond 15 Site during ebb tide flow at mean low water level, the eastern half of the basin would be completely drained and exposed, while a weak feeder current would evacuate the western half with ebb flow of about −0.02 m/sec (−0.07 ft/sec). This feeder current would accelerate to about 0.06 m/sec (0.20 ft/sec) as it flows out the inlet that would be constructed along the northeastern portion of the pond's outer levee. This velocity is below the threshold scour speed of the sediments along the bank of the Chula Vista Wildlife Reserve, located to the north of Pond 15.

Due to the size of the inlet proposed under Alternative B, velocities would be considerably less at the Pond 15 inlet opening than at the mouth of the Otay River. For Pond 15, maximum flood flow velocity at the inlet would be 0.07 m/sec (+0.22 ft/sec), while maximum ebb flow velocity would reach 0.06 m/sec (−0.20 ft/sec). These velocities would be well below the threshold scour speeds for area sediments estimated to be +/− 0.2 m/sec (+/− 0.66 ft/sec) for this area. Currents less than 0.08 m/sec (0.27 ft/sec) would result in sediment deposition; therefore, the inlet to the Pond 15 Site could result in the deposition of sediment in the inlet if there is an active sediment source nearby. However, no such source currently exists, with the exception of potential sediment yield from the tidally influenced Palomar channel during the occasional El Niño flooding event. Therefore, because tidal velocities would not result in depositional or erosional impacts associated with the proposed action under Alternative B and would not affect proposed facilities such as inlets, levees, or other facilities, changes in tidal flow and associated sedimentation impacts would be less than significant.

Regarding construction and breach of the levee at the Pond 15 inlet/outlet location, the inlet/outlet would be constructed by breaching the levee and excavating the area to create a channel with a bottom width of 160 feet and bottom elevation of −3.0 feet NAVD 88. Breaching of the levee at Pond 15 would be conducted after all earthwork in Pond 15 is completed, except for a fill area in Pond 15 near the proposed inlet/outlet that can be reserved to receive the cut material from the levee breach (Appendix H).

The excavation of the levee breach may create temporary water turbidity similar to the levee breach construction for the San Diego Bay Western Salt Pond Restoration Project completed in 2011. During the Western Salt Pond Restoration Project construction, an analysis of the breaching was conducted before it was implemented to determine whether such breaching would likely result in substantial erosion of material and associated transport into San Diego Bay and to assess potential impacts to turbidity. The results indicated that the impact would be minor, and there were no reported problems when the levees were breached for that project. Similar to the Western Salt Pond Restoration Project, the inlet/outlet and levee breach would be designed to avoid any potentially significant impacts associated with turbidity, sedimentation, and erosion impacts; however, to minimize the potential for sediment plumes entering San Diego Bay during the levee breach, MM-HYD-1 is provided. MM-HYD-1 would require that the levee breach only be excavated when turbidity levels are within 20% of ambient conditions. Upon final inspection of site conditions by the construction contractor and in coordination with the Service, a silt fence could be installed if deemed necessary, as described in MM-HYD-1; however, installation of a silt fence is not expected to be necessary based on previous analysis conducted for a similar levee breach at the Western Salt Pond Restoration Project (Lee, pers. comm. 2016). Following implementation of MM-HYD-1, impacts associated with the levee breach proposed at the Pond 15 inlet/outlet would be less than significant.

Summary

Based on the modeling results, during dry weather conditions under Alternative B, both the Otay River Floodplain Site and the Pond 15 Site would be in a steady-state equilibrium that is neither depositional nor erosional; therefore, no significant impacts associated with tidal flows would occur (Appendix G). Source water inlets at both the Otay River Floodplain Site and the Pond 15 Site would be stable and immune to closure or restriction by sedimentation and the inlets and adjacent wetland areas would not be subject to scour during dry weather tidal exchange under Alternative B. Impacts associated with tidal exchange, velocities, and associated scour effects at both the Otay River Floodplain Site and the Pond 15 Site would be less than significant. Additionally, following implementation of MM-HYD-1, impacts associated with the levee breach proposed at the Pond 15 inlet/outlet would be less than significant.

Mitigation Measures

To reduce impacts associated with construction of the inlet/outlet and levee breach at Pond 15, the following mitigation measure has been incorporated into the scope of the project:

MM-HYD-1 To minimize the potential for sediment plumes entering San Diego Bay during the levee breach, the U.S. Fish and Wildlife Service (Service) shall ensure that the levee is breached only when turbidity levels are within 20% of ambient

conditions. Upon final inspection of site conditions by the construction contractor and in coordination with the Service, a silt fence could be installed across the breach for the first 24 hours, if deemed necessary, to further reduce potential distribution of fine-grained material and associated turbidity. Following completion of the levee breach and final construction of the inlet/outlet at Pond 15, a qualified engineer shall inspect the site for erosion or sedimentation impacts and the structural integrity of the levee.

Following implementation of MM-HYD-1, impacts would be reduced to less than significant.

4.2.5.2.3 Alternative C

Figure 4.2-9, Alternative C – Flood Tide Progressive Flow at Mean High Water, and Figure 4.2-10, Alternative C – Ebb Tide Progressive Flow at Mean Low Water, illustrate the flow trajectories and depth-averaged tidal currents for Alternative C as computed by the calibrated TIDE_FEM model during spring flooding tides and the spring ebbing tides, respectively. As noted in the Tidal Hydraulic Analysis conducted for the proposed action, these data were collected on September 18, 2009 (Appendix G).

Tidal Flows at the Otay River Mouth and into the Tidal Basin

Predicted flow velocities are essentially the same as those predicted for Alternative B. Therefore, the mouth of the Otay River would also be in a steady-state equilibrium that is neither depositional or erosional under Alternative C. Tidal current speeds at the mouth of the Otay River under Alternative C throughout an entire spring/neap tidal cycle, as predicted by modeling, are expected to reach a maximum flood flow velocity of +0.339 ft/sec, while the maximum ebb flow velocity would reach −0.289 ft/sec.

During the spring ebbing tides, flow would drain from the floodplain basin, forming a feeder current in the upper river channel with velocities of approximately −0.01 m/sec (−0.03 ft/sec). This feeder current would flow out of the tidal basin and then accelerate to −0.05 m/sec (−0.16 ft/sec) as it passes through the pinch point under the railroad bridge in the narrow east/west reach of channel. Ebb flow in the channel would then accelerate further to −0.091 m/sec (−0.298 ft/sec) in the deeper north/south reach before discharging into San Diego Bay.

At these velocities, the Otay River mouth would be neither depositional nor erosional under Alternative C; therefore, impacts would be less than significant (Appendix G).

Tidal Flows at the Otay River Floodplain Site

Predicted flow velocities would be the same at the Otay River Floodplain Site as described previously in Alternative B. Impacts associated with tidal behavior at the Otay River

Floodplain Site would be considered less than significant because velocities would not result in substantial erosion or sedimentation at the site.

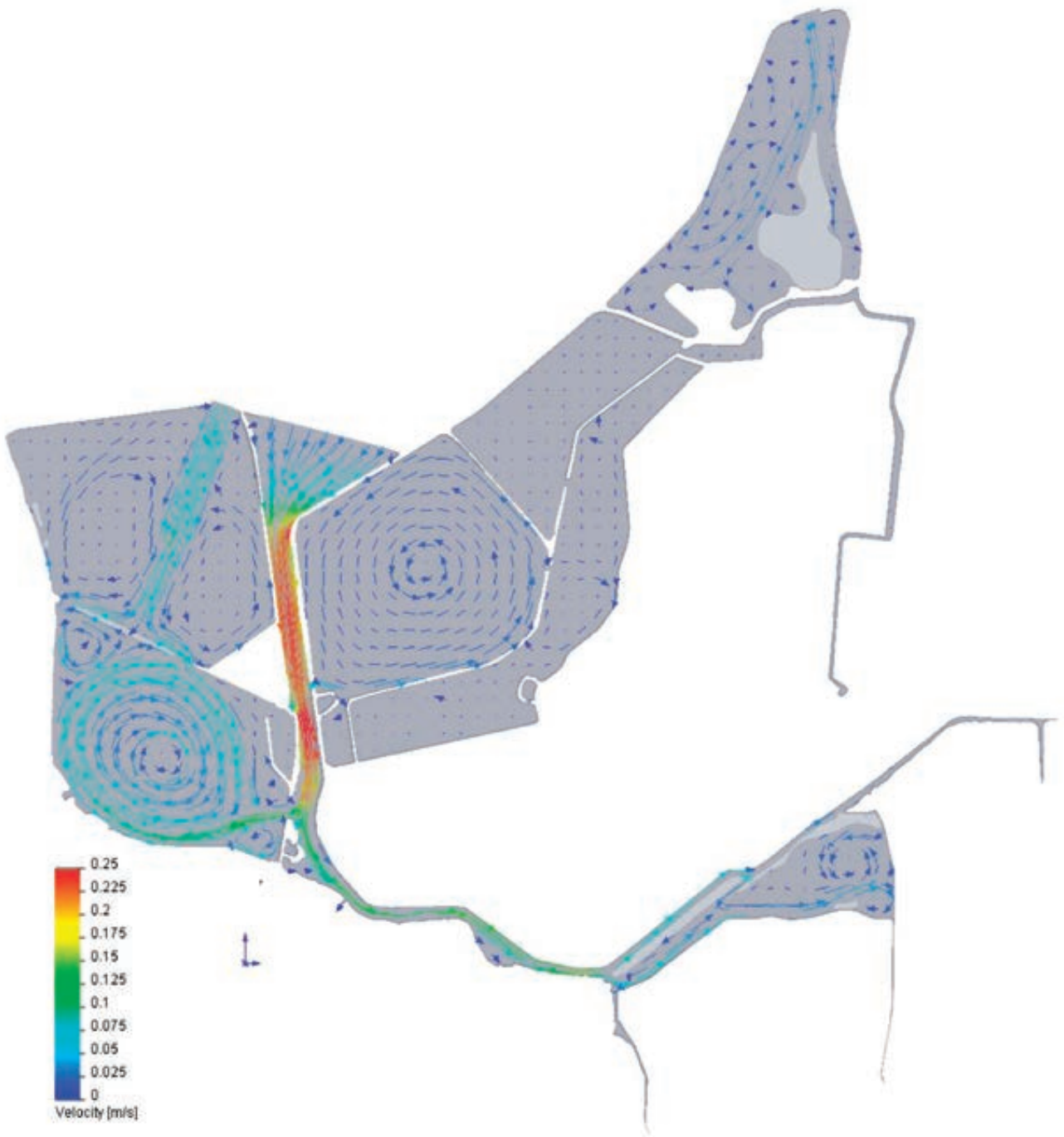
Tidal Flows at the Pond 15 Site

In Pond 15 during ebb tide flow at mean low water level, the eastern half of the basin would be completely drained and exposed, while a weak feeder current flows from the western half of the basin with ebb flow of about −0.02 m/sec (−0.07 ft/sec). This feeder current accelerates to about 0.055 m/sec (0.181 ft/sec) as it flows out the Pond 15 inlet. The inlet to the Pond 15 Site, although potentially depositional, would not be adversely affected due to the lack of an active sediment source nearby. Therefore, during dry weather conditions under Alternative C, both the Otay River Floodplain Site and the Pond 15 Site would be in a steady-state equilibrium that is neither depositional nor erosional (Appendix G). Source water inlets at both the Otay River Floodplain Site and the Pond 15 Site would be stable and immune to closure or restriction by sedimentation, and the inlets and adjacent wetland areas would not be subject to scour during dry weather tidal exchange under Alternative C. As such, erosion and sedimentation impacts at Pond 15 based on tidal velocities would be less than significant.

Additionally, the maximum flood flow velocity at the Pond 15 inlet would be +0.21 ft/sec, while maximum ebb flow velocity would reach −0.18 ft/sec, slightly less than the Pond 15 results under Alternative B and well below the threshold scour speeds for the native sediments, estimated to be +/− 0.66 ft/sec for this area.

Based on the modeling results, the ebb and flood flow velocities throughout a spring/neap cycle under Alternative C would never reach the thresholds of incipient scour and deposition of sediment is not expected to occur in the inlets.

Regarding construction and breach of the levee at the Pond 15 inlet/outlet location, the inlet/outlet would be constructed by breaching the levee and excavating the area to create a channel with a bottom width of 160 feet and bottom elevation of −3.0 feet NAVD 88. Breaching of the levee at Pond 15 would be conducted after all earthwork in Pond 15 is completed, except for a fill area in Pond 15 near the proposed inlet/outlet that can be reserved to receive the cut material from the levee breach (Appendix H).



Subtidal Alternative flood tide progressive vector flow simulation at Mean High Water (MHW), where vector trajectories are plotted over 30 minute time integrations.

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SOURCE: DR. SCOTT JENKINS CONSULTING 2014

FIGURE 4.2-9

Alternative C–Flood Tide Progressive Flow at Mean High Water

Otay River Estuary Restoration Project EIS

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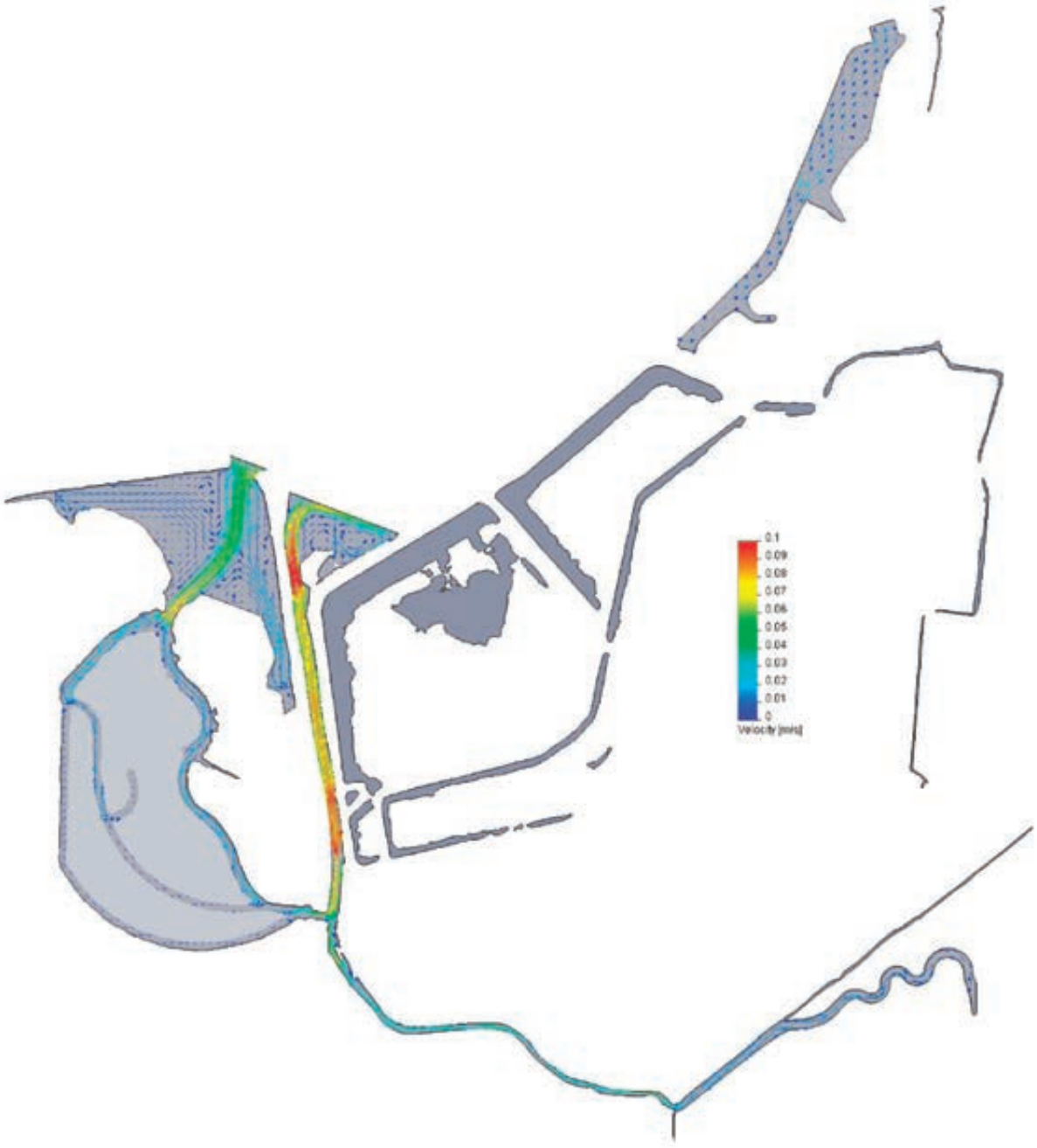

Subtidal Alternative ebb tide progressive vector flow simulation at Mean Low Water (MLW), where vector trajectories are plotted over 30 minute time integrations.

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SOURCE: DR. SCOTT JENKINS CONSULTING 2014

FIGURE 4.2-10

Alternative C–Ebb Tide Progressive Flow at Mean Low Water

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The excavation of the levee breach may create temporary water turbidity similar to the levee breach construction for the Western Salt Pond Restoration Project completed in 2011. During the Western Salt Pond Restoration Project construction, an analysis of the breaching was conducted before it was implemented to determine whether such breaching would likely result in substantial erosion of material and associated sediment transport into San Diego Bay and to assess potential impacts to turbidity. The results indicated that the impact would be minor, and there were no reported problems when the levees were breached for that project. Similar to the Western Salt Pond Restoration Project, the inlet/outlet and levee breach would be design to avoid any potentially significant impacts associated with turbidity, sedimentation, and erosion impacts; however, to minimize the potential for sediment plumes entering San Diego Bay during the levee breach, MM-HYD-1 is provided. MM-HYD-1 would require that the levee breach only be excavated when turbidity levels are within 20% of ambient conditions. Upon final inspection of site conditions by the construction contractor and in coordination with the Service, a silt fence could be installed if deemed necessary, as described in MM-HYD-1; however, installation of a silt fence is not expected to be necessary based on previous analysis conducted for a similar levee breach at the Western Salt Pond Restoration Project (Lee, pers. comm. 2016). Following implementation of MM-HYD-1, impacts associated with the levee breach proposed at the Pond 15 inlet/outlet would be less than significant.

Mitigation Measures

MM-HYD-1, as provided for Alternative B, would be implemented. Following implementation of MM-HYD-1, impacts would be reduced to less than significant.

4.2.5.3 Water Quality

Significance Threshold: Impacts would be considered significant if implementation of the proposed action would result in violations of water quality standards or waste discharge requirements, a substantial increase of downstream sedimentation, or the introduction of contaminants (non-point source pollution) into the watershed. Substantial changes in groundwater or surface water quality as a result of the proposed action would also be considered significant.

Water quality is affected by sedimentation caused by erosion, runoff carrying contaminants, and direct discharge of pollutants (point-source pollution). As land is developed, new impervious surfaces send an increased volume of runoff containing oils, heavy metals, pesticides, fertilizers, and other contaminants (non-point source pollution) into adjacent watersheds. Stormwater that accumulates on impervious surfaces, such as parking lots, roof tops, and streets, drains directly and indirectly to waters of the United States. The proposed action would not include large areas of impervious surface because the proposed action would primarily consist of habitat restoration efforts; therefore, this section focuses on the impacts associated with existing environmental conditions that may affect water quality at the project site, and impacts associated with

implementation of the proposed action, particularly during construction, that may contribute to water quality degradation.

Under Section 303(d) of the Clean Water Act, the State Water Resources Control Board was required to develop a list of water quality limited segments for jurisdictional waters of the United States. The waters on the list do not meet water quality standards; therefore, the Regional Water Quality Control Boards were required to establish priority rankings, called total maximum daily loads, and develop action plans to improve water quality. The San Diego Bay is listed under Section 303(d) of the Clean Water Act for PCBs. The Otay River at the project site is not listed as an impaired water body for any pollutants under Section 303(d) of the Clean Water Act (SWRCB 2015).

A fluvial sedimentation analysis was conducted to identify potential impacts associated with fluvial sediment delivery and sedimentation associated with the proposed action. Analytical methods and existing data were used to estimate fluvial sediment loads from the watershed, which were then used to estimate potential sedimentation of the proposed wetland (Appendix H). Impacts associated with DDT contamination as it relates to flooding, erosion, and sedimentation activity is analyzed in Section 4.2.10, Contaminants.

4.2.5.3.1 Alternative A

The Otay River Floodplain Site, and to a smaller extent, the Pond 15 Site, would be subject to erosion during large storm events under existing conditions that could lead to the transport of existing contaminants in the surrounding area into these sites. As described in Sections 4.2.5.1 and 4.2.5.2, soil composed of fine to coarse sand, as identified on the project site, would start to erode when the water velocity reaches and exceeds 0.6 ft/sec. As described in detail in Appendix H, hydrologic modeling of existing conditions indicates that velocities in excess of 0.6 ft/sec would occur in this area under various storm events, with the greatest erosion occurring during the 100-year flood event. Therefore, under existing conditions, erosion could occur on the project site during a flood event resulting in the deposition of sediments, along with any contaminants present in those soils, into the Otay River channel and ultimately San Diego Bay (refer to Section 4.2.10 for additional information regarding contaminant-related impacts, including DDT). Although transport of contaminated soils into surrounding water bodies could occur under Alternative A during a large storm event, no grading, vegetation removal, or other activities that could affect flood flow velocities or alter the direction of water movement across the site would occur. Therefore, Alternative A would not result in any actions that would exacerbate the effects of existing conditions, and no significant impacts to water quality would occur through implementation of Alternative A.

In addition, there would be no net deficit in aquifer volume or a reduction in the local groundwater table as a result of Alternative A (Appendix H).

Mitigation Measures

No significant impacts are anticipated under Alternative A; therefore, no mitigation measures are required.

4.2.5.3.2 Alternative B

Construction-Related Water Quality Impacts

Implementation of the proposed action could entail routine transport of potentially hazardous materials, including gasoline, oil solvents, cleaners, and other common substances associated with construction equipment, support vehicles, and construction materials. Unanticipated and/or unintended release of these substances could result in potentially significant surface water quality and groundwater quality impacts; therefore, MM-HYD-2 is provided. MM-HYD-2 would require preparation and implementation of a hazardous substance management, handling, storage, disposal, and emergency response plan. Implementation of MM-HYD-2 and the associated hazards response plan would reduce impacts related to unanticipated release of substances to less than significant.

Additionally, during transport of excavated soil between the Otay River Floodplain Site and the Pond 15 Site, unintended release or spill of soil would have the potential to occur under all three transport options (truck transport, transport via conveyor belt, or transport via slurry pipeline). MM-HYD-3 is provided to mitigate impacts related to unanticipated soil spillage during truck transport. MM-HYD-4 is provided to mitigate impacts related to unanticipated soil spillage during transport via either conveyor belt or slurry pipeline. Implementation of MM-HYD-3 or MM-HYD-4, as appropriate, would reduce impacts associated with material transport to less than significant.

Moreover, as provided in MM-GEO-1, a SWPPP would be prepared that specifies BMPs to be implemented during project construction to prevent pollutants from contacting stormwater and to control erosion and sedimentation, which may result in the introduction of contaminants to nearby water bodies, including the Otay River Floodplain Site, the Pond 15 Site, San Diego Bay, and the Otay River. The SWPPP would be prepared and submitted to the Regional Water Quality Control Board for review and approval before construction begins. Implementation of the SWPPP during construction would reduce potential impacts associated with the introduction of construction-generated contaminants to nearby water bodies to less than significant.

Sediment Transport and Loading

A fluvial sedimentation analysis was conducted by Everest International Consultants as part of the *Otay River Estuary Restoration Project Fluvial Hydraulics Study* (Appendix H) to evaluate

fluvial sediment delivery from the upstream watershed to the Otay River Floodplain Site and the subsequent rate of sedimentation under the proposed action.

As described in the fluvial hydraulics study, in the Otay River Watershed, fluvial sediments are transported from the watershed along the Otay River into San Diego Bay. Soils along mountains and canyons are primarily eroded during storm events and washed downstream. A portion of eroded sediment, typically gravels and sands, deposits along the riverbed, while finer sediment generally deposits in the river floodplain or delta that forms where the river meets San Diego Bay. Overall, sediment loadings are relatively small because sediment from the upper portion of the watershed is not transported past the Lower Otay Reservoir (Appendix H).

Additionally, not all of the sediment loadings from the Otay River Watershed would reach the proposed Otay River Floodplain Site because only portions of the discharge from the Otay River would go through the site. Moreover, depending on the sediment distribution in the sediment loads, some of the larger sediments would deposit along the riverbed and only the fine sediments in suspension would be transported with the flow into the Otay River Floodplain Site.

The total sediment loading generated from the watershed is composed of eroded sediment of different sizes. Sediment from the Otay River Watershed is generated from areas with roughly half sedimentary and half Southern California batholith, resulting in a general sediment composition of approximately 50% fines and 50% sands. A portion of the sediment load, primarily sands or gravels, would be deposited mostly in the riverbed. Finer sediment material is more likely to stay in suspension and be transported with the river flow. Therefore, it is estimated that only approximately 50% of the estimated total sediment loadings from the watershed would stay in suspension, which is approximately 323 to 680 cubic yards per year.

As described previously, only a portion of river flow and its associated suspended sediment would flow through the proposed Otay River Floodplain Site, and as a result, the suspended sediment load from the watershed to the site area would be less than the above-estimated 323 to 680 cubic yards per year. During flood events, a portion of the flow would overtop the levees along the river and would not flow through the Otay River Floodplain Site. Based on TUFLOW model results, only about 15%, 45%, and 60% of the flood flow for the 25-, 50-, and 100-year flood events, respectively, would pass through the proposed Otay River Floodplain Site. Because sediment loads in general are associated with flood events, based on the model results for the 25-50-, and 100-year events, it is estimated that only approximately 50% of the estimated suspended sediment loads of 323 to 680 cubic yards per year would go through the project area (i.e., the annual sediment load to the Otay River Floodplain Site would be approximately 160 to 340 cubic yards per year (Appendix H).

Based on the technical findings described in Appendix H and as informed by the modeling results, it is unlikely that all the suspended sediments passing through the Otay River Floodplain Site would settle to the bed; however, a conservative estimate of the sedimentation rate in the Otay River Floodplain Site is to assume all the suspended sediment would be uniformly deposited over the entire site area (33.51 acres). Under this conservative assumption and the estimated annual suspended sediment load of 160 to 340 cubic yards per year, the estimated sedimentation rate in the proposed Otay River Floodplain Site would be between 0.04 and 0.08 inches per year. If it is assumed that approximately half of the suspended sediment that passes through the site would actually settle and stay in the wetland, the average annual sedimentation rate in the wetland would be approximately 0.02 to 0.04 inches per year, which is considered low (Appendix H). Therefore, because these conservative sedimentation rates would be considered low, sedimentation transport resulting from flood events would not result in significant water quality impacts, and impacts would be less than significant.

Introduction of Contaminants into Nearby Water Bodies

Implementation of the proposed action would involve creating various wetland and upland habitat types, and as a result, no permanent physical development would occur other than minor supporting project features as shown on Figure 2-1a. Because no permanent physical development is proposed, no substantial increase in impervious surfaces would be introduced into the project area that could increase non-point source pollutant runoff and associated introduction of contaminants to nearby water bodies. Additionally, following completion of construction activities, no other feature of the proposed action would introduce additional (non-existing) contaminants to the area that could run off or be released into the Otay River Floodplain Site, the Pond 15 Site, the Otay River, the San Diego Bay, or any other nearby water body.

Moreover, large storm events, such as the 100-year flood event, would potentially result in the transport of existing contaminant sources, or salinity-laden water sources from adjacent salt ponds, to the Otay River Floodplain Site and, to a smaller extent, the Pond 15 Site. Although the potential for this occurrence exists, implementation of the proposed action would not exacerbate existing contaminant impacts to nearby water bodies, including those proposed under the proposed action. The Otay River Floodplain Site and Pond 15 Site would be designed, using berm buffers and other protective project features, to protect and isolate the proposed wetland habitats from the introduction of contaminants into the site boundaries. Furthermore, the proposed Otay River Floodplain Site and Pond 15 Site would not be more subject to flooding and associated transportation of contaminants than surrounding water bodies in the area, including the Otay River and the San Diego Bay. These large storm events would occur whether the proposed action is implemented or not; therefore, implementation of the proposed action would

not result in a significant impact related to the transport of existing contaminants to the Otay River Floodplain Site or the Pond 15 Site or any other nearby water body.

Other impacts associated with post-action flooding and erosion in and around the site, including at the staging area and stockpile locations, as described previously, would be considered potentially significant. To reduce impacts associated with erosion, sedimentation, and material transport, MM-VIS-1, MM-GEO-1, MM-GEO-2, MM-HYD-1, MM-HYD-2, MM-HYD-3, and MM-HYD-4 are provided. Following implementation of these measures, impacts associated with erosion, sedimentation, and material transport (and thus, the introduction of contaminants to water bodies) would be less than significant.

Refer to Section 4.2.10 for detailed information regarding contaminant-related impacts, including DDT, under the proposed action.

Summary

In summary, Alternative B would not violate any water quality standards or waste discharge requirements, substantially increase or contribute to downstream sedimentation, or otherwise substantially degrade existing water quality. Although contaminants from soils in the eastern portion of the Otay River Floodplain Site may erode into and be suspended in floodwaters during a large storm event, implementation of Alternative B would not exacerbate this existing condition, nor would it introduce any additional contaminants to the site or nearby water bodies. Therefore, impacts would be less than significant. To reduce previously identified impacts associated with sedimentation, erosion, and material transport, MM-VIS-1, MM-GEO-1, MM-GEO-2, MM-HYD-1, MM-HYD-2, MM-HYD-3, and MM-HYD-4 are provided. Following implementation of these measures, impacts associated with erosion, sedimentation, and material transport (and thus, the introduction of contaminants into water bodies) would be less than significant.

Refer to Section 4.2.10 for detailed information regarding contaminant-related impacts, including DDT, under the proposed action.

Mitigation Measures

To reduce potential impacts identified associated with material transfer between the Otay River Floodplain Site and the Pond 15 Site, the following mitigation measures are provided:

MM-HYD-2 Prior to commencement of construction activities, the contractor shall prepare to the satisfaction of the Service a hazardous substance management, handling, storage, disposal, and emergency response plan for all phases of construction. The plan shall address where and how construction vehicles will be parked, fueled,

and serviced and what actions will be taken to avoid and reduce the risk of accidental release of hazardous materials (e.g., diesel fuel, gasoline, lubricants, coolant, oil solvents, cleaners) during construction activities at the site.

The plan shall also identify the worst case spill scenario and list the protocols for spill prevention and response actions that would be taken in the event of unintended spillage of hazardous materials or unintended release of hazardous substances during construction activities.

As part of plan implementation, a hazardous materials spill kit shall be maintained on site and a construction monitor shall be designated to ensure that all contractors are in compliance with applicable regulations, including regulations regarding hazardous materials and hazardous wastes, including disposal. Hazardous materials shall not be disposed of or released on the ground, in the underlying groundwater, or in any surface water. Totally enclosed containment shall be provided for all trash. All construction waste, including litter, garbage, and other solid waste, shall be diverted, recycled, or properly disposed of. Petroleum products and other potentially hazardous materials shall be removed to a waste facility permitted to treat, store, or dispose of such materials.

MM-HYD-3 The Service shall ensure that appropriate measures are implemented by the contractor during the transport of excavated material from the Otay River Floodplain Site to the Pond 15 Site to prevent the release of dust into adjacent wetland areas and the tracking of dirt onto surface streets. Such measures include covering trucks hauling sediment or other loose materials or requiring them to maintain at least 2 feet of freeboard (i.e., vertical space between the top of the load and top of the trailer); watering active haul roads and staging areas as needed to minimize the generation of dust from construction activity; installing wheel washers where vehicles enter and exit unpaved roads; conducting daily street sweeping if visible soil materials are carried to adjacent streets; and establishing construction traffic speeds of 15 miles per hour or less on all unpaved roads. All construction workers shall be educated on proper protocols for loading, transport, and unloading of trucks prior to commencement of soil-hauling activities.

MM-HYD-4 If soil transport between the Otay River Floodplain Site and the Pond 15 Site would be conducted via conveyor belt or slurry pipeline, a soil transport monitoring plan shall be prepared by the construction contractor for review and approval by the Service prior to commencement of soil transport activities. The soil transport monitoring plan shall include monitoring protocols to ensure that unanticipated spills of transported soil material would not occur from

conveyor belt or slurry pipeline operations. The monitoring plan shall include what actions will be taken in the event of unintended spill or leakage of soil or slurry material into adjacent wetland areas and salt ponds during soil transport via conveyor belt or slurry pipeline.

Additionally, to reduce previously identified impacts associated with sedimentation, erosion, and material transport, MM-VIS-1, MM-GEO-1, MM-GEO-2, MM-HYD-1, MM-HYD-2, MM-HYD-3, and MM-HYD-4 would be implemented. Implementation of these measures would reduce all potentially significant impacts associated with hydrology and water quality to less than significant.

4.2.5.3.3 Alternative C

Construction-Related Water Quality Impacts

Similar impacts would result from the implementation of Alternative C, as analyzed under Alternative B in Section 4.2.5.3.2. Construction activities would involve the routine use and transport of potentially hazardous materials. MM-HYD-2 is provided to reduce impacts associated with unanticipated and/or unintended spills at the site through implementation of a hazardous substance management, handling, storage, disposal, and emergency response plan for all phases of construction.

Additionally, during transport of excavated soil between the Otay River Floodplain Site and the Pond 15 Site, unintended release or spill of soil would have the potential to occur under all three transport options (truck transport, transport via conveyor belt, or transport via slurry pipeline). Implementation of MM-HYD-3 or MM-HYD-4 would reduce impacts associated with material transport to less than significant.

Moreover, as provided in MM-GEO-1, a SWPPP would prepared that specifies BMPs to be implemented during project construction to prevent pollutants from contacting stormwater and to control erosion and sedimentation. Implementation of the SWPPP during construction would reduce potential impacts associated with the introduction of construction-generated contaminants to nearby water bodies to less than significant.

Sediment Transport and Loading

Based on the technical findings described in Appendix H and as informed by the modeling results, sedimentation rates would be considered low; thus, sedimentation transport resulting from flood events would not result in significant water quality impacts. Therefore, water quality impacts related to sediment loading would be less than significant.

Introduction of Contaminants to Nearby Water Bodies

Similar to Alternative B, large storm events, such as the 100-year flood event, could potentially result in the transportation of existing contaminant sources, or salinity-laden water sources from adjacent salt ponds, to the Otay River Floodplain Site and to a smaller extent, the Pond 15 Site. Although the potential for this occurrence exists, implementation of the proposed action would not exacerbate existing contaminant impacts to nearby water bodies, including those proposed under the proposed action. The Otay River Floodplain Site and Pond 15 Site would be designed, using berm buffers and other protective project features, to protect and isolate the proposed wetland habitats from the introduction of contaminants into the site boundaries. Furthermore, the proposed Otay River Floodplain Site and Pond 15 Site would not be more subject to flooding and associated transportation of contaminants than surrounding water bodies in the area, including the Otay River and the San Diego Bay. These large storm events would occur whether the proposed action is implemented or not; therefore, proposed action implementation would not result in a significant impact related to the transport of existing contaminants to the Otay River Floodplain Site, the Pond 15 Site, or any other nearby water body.

In summary, Alternative C would not violate any water quality standards or waste discharge requirements, substantially increase or contribute to downstream sedimentation, or otherwise substantially degrade existing water quality. Although contaminants from soils in the eastern portion of the Otay River Floodplain Site may erode into and be suspended in floodwaters during a large storm event, implementation of Alternative C would not exacerbate this existing condition, nor would it introduce any additional contaminants to the site or nearby water bodies. Therefore, impacts would be less than significant. To reduce previously identified impacts associated with sedimentation, erosion, and material transport, MM-VIS-1, MM-GEO-1, MM-GEO-2, MM-HYD-1, MM-HYD-2, MM-HYD-3, and MM-HYD-4 are provided. Following implementation of these measures, impacts associated with erosion, sedimentation, and material transport (and thus, the introduction of contaminants to water bodies) would be less than significant.

Refer to Section 4.2.10 for detailed information regarding contaminant-related impacts, including DDT, under the proposed action.

Mitigation Measures

MM-VIS-1, MM-GEO-1, MM-GEO-2, MM-HYD-1, MM-HYD-2, MM-HYD-3, and MM-HYD-4 would be implemented. Implementation of these measures would reduce potentially significant impacts associated with hydrology and water quality to less than significant.

4.2.6 Air Quality

Use of Air Quality Thresholds General Conformity

Implementation of the ORERP would result in direct emissions related to excavation and transport of material within the project site, contouring of the excavated site in preparation for planting, transport of materials to and from the site, and travel to and from the site by contractors, project managers, and monitors. Indirect emissions associated with the long-term maintenance and monitoring of the restoration site would be minimal.

Under the General Conformity regulations, both the direct and indirect emissions associated with a Federal action must be evaluated. Title 40 of the Code of Federal Regulations, Part 93, Subpart B, defines direct emissions as:

> [T]hose emissions of a criteria pollutant or its precursors that are caused or initiated by the Federal action and originate in a nonattainment or maintenance area and occur at the same time and place as the action and are reasonably foreseeable.

Indirect emissions are defined as follows:

> [T]hose emissions of a criteria pollutant or its precursors:
>
> 1. That are caused or initiated by the Federal action and originate in the same nonattainment or maintenance area but occur at a different time or place as the action
> 2. That are reasonably foreseeable
> 3. That the agency can practically control
> 4. For which the agency has continuing program responsibility.

For the purposes of this definition, even if a Federal licensing, rulemaking, or other approving action is a required initial step for a subsequent activity that causes emissions, such initial steps do not mean that a Federal agency can practically control any resulting emissions. However, in this case, the Service would be responsible for long-term maintenance and monitoring of the site and subsequent emissions associated with this activity.

A conformity determination is required for each criteria pollutant or precursor where the total of direct and indirect emissions of the criteria pollutant or precursor in a Federal nonattainment or maintenance area would equal or exceed specified annual emission rates, referred to as "de minimis" thresholds. For ozone (O_3) precursors and particulate matter less than or equal to

10 microns in diameter (PM_{10}), the de minimis thresholds depend on the severity of the nonattainment classification; for other pollutants, the threshold is set at 100 tons per year, as noted in Table 4.2-1.

As indicated in Table 4.2-1, the San Diego Air Basin (SDAB) is designated by the U.S. Environmental Protection Agency as a maintenance area for the 1997 8-hour National Ambient Air Quality Standards (NAAQS) for O_3 and as a marginal nonattainment area for the 2008 8-hour NAAQS for O_3. The western and central portions of the SDAB are designated as a carbon monoxide (CO) maintenance area. The SDAB is in attainment with all remaining NAAQS. The relevant de minimis thresholds for the SDAB are 100 tons per year for volatile organic compounds (VOCs) (an O_3 precursor), oxides of nitrogen (NO_x) (an O_3 precursor), and CO, as shown in Table 4.2-1.

Table 4.2-1
General Conformity De Minimis Thresholds

Criteria Pollutant	Status	Annual (tons/year)
Volatile organic compounds (VOC)	Marginal nonattainment (O_3)	100
Oxides of nitrogen (NO_x)	Marginal nonattainment (O_3)	100
Carbon monoxide (CO)	Attainment/maintenance	100

Source: 40 CFR, Part 93.

San Diego County Air Pollution Control District

As part of its air quality permitting process, the San Diego County Air Pollution Control District (SDAPCD) has established thresholds in Rule 20.2 requiring the preparation of air quality impact assessments for permitted stationary sources. The SDAPCD sets forth quantitative emission thresholds below which a stationary source would not have a significant impact on ambient air quality. Project-related air quality impacts estimated in this environmental analysis would be considered significant if any of the applicable significance thresholds presented in Table 4.2-2 are exceeded.

Table 4.2-2
SDAPCD Air Quality Significance Thresholds

Construction and Operational Emissions			
	Total Emissions		
Pollutant	*Pounds Per Hour*	*Pounds Per Day*	*Tons Per Year*
Respirable particulate matter (PM_{10})	—	100	15
Fine particulate matter ($PM_{2.5}$)	—	55	10
Oxides of nitrogen (NO_x)	25	250	40
Sulfur oxides (SO_x)	25	250	40

Table 4.2-2
SDAPCD Air Quality Significance Thresholds

Construction and Operational Emissions			
	Total Emissions		
Pollutant	*Pounds Per Hour*	*Pounds Per Day*	*Tons Per Year*
Carbon monoxide (CO)	100	550	100
Volatile organic compounds (VOCs)	—	75*	13.7
Lead and lead compounds	—	3.2	0.6

Sources: SDAPCD Rules 1501 (SDAPCD 1995) and 20.2(d)(2) (SDAPCD 1998).
Notes: * VOC threshold based on the threshold of significance for VOCs from the South Coast Air Quality Management District for the Coachella Valley as stated in the San Diego County Guidelines for Determining Significance.

The thresholds listed in Table 4.2-2 represent screening-level thresholds that can be used to evaluate whether project-related emissions could cause a significant impact on air quality. Emissions below the screening-level thresholds would not cause a significant impact. In the event that emissions exceed these thresholds, modeling would be required to demonstrate that the project's total air quality impacts result in ground-level concentrations that are below the California Ambient Air Quality Standards (CAAQS) and the NAAQS, including appropriate background levels. For nonattainment pollutants, if emissions exceed the thresholds shown in Table 4.2-2, the proposed action could have the potential to result in a cumulatively considerable net increase in these pollutants and thus could have a significant impact on the ambient air quality.

Methodology and Assumptions

Emissions from the construction phase of the project were estimated using the California Emissions Estimator Model (CalEEMod) Version 2013.2.2, available online (www.caleemod.com). For the purposes of modeling, it was assumed that the construction of the proposed action would commence in August 2017 and would be completed in December 2020. Project design includes that all equipment used on site would be Tier 3 engine classification or above except where Tier 3 engines are not available. Construction would occur intermittently over an approximately 2.5-year period, consisting of the following subphases:

- Mobilization (2 months)
- Dewatering of Pond 15 (1 month)
- Earthwork (4 months)
- Shutdown (1 month)
- Core nesting season (no construction activity) (5 months)
- Remobilization (1 month)
- Earthwork (4 months)

- Demobilization (2 months)
- Grading of the Pond 15 Site (4 months)

Should the pipeline soil movement option be selected, once all the material from the Otay River Floodplain Site has been pumped to the Pond 15 Site, the material would be left in place until final consolidation has been achieved, which could take up to 5 years, ending construction in December 2024. Construction equipment would include backhoes, loaders, scrapers, bulldozers, dump trucks, and water trucks. It was assumed that an electric generator would be used under the conveyor belt and pipeline construction alternatives to power the mechanisms necessary to move the soil from the Otay River Floodplain Site.

Construction of both action alternatives would require the excavation (cut) of approximately 320,000 cubic yards of soil under Alternative B to 370,000 cubic yards under Alternative C in the Otay River Floodplain Site. Of the cut soil, approximately 260,000 cubic yards under Alternative B to 310,000 cubic yards under Alternative C would be transported to the Pond 15 Site. For the purposes of modeling, it was assumed that approximately 50% of the soil to be transported would be transferred to the Pond 15 Site during the first earthwork construction subphase, which would commence in October 2017. During the second earthwork subphase, which would commence in September 2018, it was assumed the remaining 50% of the soil would be transported to the Pond 15 Site, and the entirety of the Otay River Floodplain Site would be graded.

A detailed depiction of the construction schedule, including information regarding subphases and equipment used during each subphase, is provided in Chapter 2.

Construction equipment and methodology was provided by Everest International Consultants (Appendix E) and equipment mix is meant to represent a reasonably conservative estimate of construction activity. For the analysis, it was generally assumed that heavy construction equipment would be operating at the site for approximately 8 hours per day, 5 days per week during project construction. Additionally, CalEEMod model defaults were used to determine peak worker trips during construction. For purposes of providing conservative estimates during construction activities, it was assumed peak worker trips would occur during all phases of construction; however, it is anticipated that activities during mobilization and demobilization would require fewer construction workers compared to peak soil transfer activities. Vendor trips were calculated using CalEEMod default trip rates ratios, which are approximately 40% of worker trips for industrial projects (Environ 2013). Construction equipment is conservatively estimated to include scrapers, tractors, loaders, backhoes, and a water truck in addition to haul trucks transporting material between the two project sites. The details are included in Appendix M of this EIS.

The proposed action is subject to SDAPCD Rule 55, Fugitive Dust Control. This rule requires that the project take steps to restrict visible emissions of fugitive dust beyond the property line. Compliance with Rule 55 would limit fugitive dust (PM_{10} and particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$)) that may be generated during grading and construction activities. To account for dust control measures in the calculations, it was assumed that the active sites would be watered at least three times daily, resulting in an approximately 61% reduction of particulate matter.

4.2.6.1 Violation of Air Quality Standards

Significance Threshold: Implementation of the proposed action would have a significant direct impact on air quality if the proposed action would result in emissions equal to or in excess of the General Conformity de minimis thresholds as listed in Table 4.2-1 or the standards outlined in Rule 1501 of the SDAPCD Rules and Regulations as listed in Table 4.2-2.

4.2.6.1.1 Alternative A

Under the no action alternative, no grading or other construction activities would occur; therefore, no criteria pollutant emissions would be generated under this alternative, and ambient air conditions would remain similar to existing conditions. As a result, implementation of this alternative would not result in any exceedances in the SDAPCD daily thresholds or General Conformity annual de minimis thresholds; therefore, no significant impacts to air quality are anticipated. The implementation of Alternative A would not result in emissions equal to or in excess of the standards outlined in Rule 1501 of the SDAPCD Rules and Regulations.

Mitigation Measures

No significant impacts related to air quality are anticipated under Alternative A; therefore, no mitigation measures are required.

4.2.6.1.2 Alternative B

The implementation of this alternative would result in a temporary addition of pollutants to the local airshed caused by soil disturbance, fugitive dust emissions, and combustion pollutants from on-site construction equipment, as well as from trucks hauling construction materials and soil from the Otay River Floodplain Site to the Pond 15 Site. Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and, for dust, the prevailing weather conditions. Fugitive dust (PM_{10} and $PM_{2.5}$) emissions would result from ground-disturbing activities, in addition to hauling of material between the Otay River Floodplain Site and the Pond 15 Site and stockpiling of material on the eastern portion of the Otay River Floodplain Site. As outlined above, the proposed action is subject to SDAPCD Rule 55, Fugitive Dust Control. To comply with this regulation, fugitive dust control measures

are included in the project design, such as watering the site at least three times daily throughout the duration of construction.

NO_x and CO emissions would primarily result from the use of construction equipment and motor vehicles. Construction activities would take place over a period of approximately 2.5 years for the truck soil transport and conveyor belt soil transport options, and over approximately 7.5 years for the pipeline soil transport option. Trucks trips under the truck soil transport option were calculated based on the amount of soil to be exported to Pond 15, assuming each haul truck would have a 12-cubic-yard soil carrying capacity. The one-way distance from the Otay River Floodplain Site to the Pond 15 Site is approximately 3.5 miles (7 miles round trip). All trips provided in CalEEMod are assumed to be one-way. Truck trip estimates were calculated as follows:

Alternative B – ((260,000 total cubic yards to be exported ÷ 12 cubic yards truck capacity) × 1.3 bulking factor × 2 one-way trips) ÷ (209 days of soil export) =

- 270 one-way trips per day
- 28,167 total one-way trips per earthwork phase
- 56,333 total one-way trips during entire construction period

Alternative C – ((310,000 total cubic yards to be exported ÷ 12 cubic yards truck capacity) × 1.3 bulking factor × 2 one-way trips) ÷ (209 days of soil export) =

- 321 one-way trips per day
- 33,550 total one-way trips per earthwork phase
- 67,100 total one-way trips during entire construction period

Tables 4.2-3 through 4.2-5 provide estimated emissions that would be generated during construction of the three soil transport options (truck transport, conveyor belt, and pipeline).

Tables 4.2-3 through 4.2-5 compare the estimated emissions to the SDAPCD daily thresholds (denoted in pounds per day) and the annual General Conformity de minimis thresholds (denoted in tons per year) for each pollutant. It should be noted that the only criteria pollutant for which the SDAB is a Federal nonattainment area is O_3 (2008 8-hour standard), for which it is classified as a "marginal" nonattainment area, indicating the lowest concentrations of a pollutant within the nonattainment classification (as compared to areas designated as "moderate," "serious," "severe," or "extreme" nonattainment for a particular pollutant). A "marginal" designation thus indicates that an area is close to attainment for that pollutant. For all other criteria pollutants, the SDAB is considered attainment or unclassified under the NAAQS. The basin is currently designated nonattainment for O_3 and particulate matter, PM_{10} and $PM_{2.5}$, under the CAAQS. For all other criteria pollutants, the SDAB is considered attainment or unclassified under the CAAQS.

It should be noted that O_3 is not a primary pollutant (and thus, not a "criteria" air pollutant); it is a secondary pollutant formed by complex interactions of two pollutants directly emitted into the atmosphere. O_3 is a colorless gas that is formed in the atmosphere when VOCs, sometimes referred to as reactive organic gases, and NO_x react in the presence of ultraviolet sunlight.

Table 4.2-3
Estimated Construction Emissions –Alternative B: Truck Transport Option

Construction Year	Pollutant (pounds/day)					
	VOC	*NO_x*	*CO*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
2017	8.49	89.50	139.43	0.20	15.23	9.12
2018	6.61	78.48	129.03	0.18	15.85	8.94
2019	3.27	60.53	73.45	0.13	13.01	8.05
Estimated Emissions (maximum daily)	*8.49*	*89.50*	*139.43*	*0.20*	*15.85*	*9.12*
SDAPCD threshold	75	250	550	250	100	55
Exceed threshold?	No	No	No	No	No	No
Construction Year	**Pollutant (tons/year)**					
	VOC	*NO_x*	*CO*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
2017	0.29	3.31	5.11	0.00	0.71	0.42
2018	0.44	5.19	8.18	0.01	1.33	0.77
2019	0.18	3.21	3.96	0.00	0.70	0.43
Estimated Emissions (maximum annual)	*0.44*	*5.19*	*8.19*	*0.01*	*1.33*	*0.77*
De minimis threshold	100	100	100	N/A	N/A	N/A
Exceed threshold?	No	No	No	N/A	N/A	N/A

Source: See Appendix M for complete results.
Notes: VOC = volatile organic compounds; NO_x = nitrogen oxides; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; N/A = not applicable.
N/A – General Conformity does not apply to SO_x, PM_{10}, or $PM_{2.5}$ in the SDAB.
Pounds/day – denotes emissions for comparison against SDAPCD thresholds.
Tons/year – denotes emissions for comparison against annual Federal de minimis thresholds.

Table 4.2-4
Estimated Construction Emissions – Alternative B: Conveyor Belt Option

Construction Year	Pollutant (pounds/day)					
	VOC	*NO_x*	*CO*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
2017	5.32	72.65	86.80	0.16	14.03	8.68
2018	3.59	62.88	77.51	0.14	13.09	8.13
2019	3.27	60.53	73.44	0.13	13.01	8.05
Estimated Emissions (maximum daily)	*5.32*	*72.65*	*86.80*	*0.16*	*14.03*	*8.68*
SDAPCD threshold	75	250	550	250	100	55
Exceed threshold?	No	No	No	No	No	No

Table 4.2-4
Estimated Construction Emissions – Alternative B: Conveyor Belt Option

Construction Year	Pollutant (tons/year)					
	VOC	*NO_x*	*CO*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
2017	0.17	2.65	3.25	0.00	0.67	0.40
2018	0.25	4.16	5.15	0.00	1.25	0.74
2019	0.18	3.21	3.96	0.00	0.70	0.43
Estimated Emissions (maximum annual)	*0.25*	*4.16*	*5.15*	*0.00*	*1.2447*	*0.74*
De minimis threshold	100	100	100	N/A	N/A	N/A
Exceed threshold?	No	No	No	N/A	N/A	N/A

Source: See Appendix M for complete results.
Notes: VOC = volatile organic compounds; NO_x = nitrogen oxides; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; N/A = not applicable.
N/A – General Conformity does not apply to SO_x, PM_{10}, or $PM_{2.5}$ in the SDAB.
Pounds/day – denotes emissions for comparison against SDAPCD thresholds.
Tons/year – denotes emissions for comparison against annual Federal de minimis thresholds.

Table 4.2-5
Estimated Construction Emissions – Alternative B: Pipeline Option

Construction Year	Pollutant (pounds/day)					
	VOC	*NO_x*	*CO*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
2017	14.88	156.12	117.27	0.16	33.29	20.47
2018	11.59	127.61	97.40	0.14	31.28	18.94
2019	0.33	1.60	4.22	0.00	0.57	0.17
2020	9.75	105.05	83.35	0.13	30.08	17.74
Estimated Emissions (maximum daily)	*14.88*	*156.12*	*117.27*	*0.16*	*33.29*	*20.47*
SDAPCD threshold	75	250	550	250	100	55
Exceed threshold?	No	No	No	No	No	No
Construction Year	**Pollutant (tons/year)**					
	VOC	*NO_x*	*CO*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
2017	0.17	2.65	3.25	0.00	0.67	0.40
2018	0.25	4.16	5.15	0.00	1.24	0.74
2019	0.01	0.06	0.16	0.00	0.02	0.00
2020	0.17	3.17	3.83	0.00	0.68	0.42
Estimated Emissions (maximum annual)	*0.25*	*4.17*	*5.15*	*0.00*	*1.24*	*0.74*
De minimis threshold	100	100	100	N/A	N/A	N/A
Exceed threshold?	No	No	No	N/A	N/A	N/A

Source: See Appendix M for complete results.
Note: VOC = volatile organic compounds; NO_x = nitrogen oxides; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; N/A = not applicable
N/A – General Conformity does not apply to SO_x, PM_{10}, or $PM_{2.5}$ in the SDAB.
Pounds/day – denotes emissions for comparison against SDAPCD thresholds.
Tons/year – denotes emissions for comparison against annual Federal de minimis thresholds.

As shown, daily construction emissions would not exceed the thresholds for any of the criteria air pollutants: VOC, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$. Additionally, criteria pollutants emissions would not exceed the annual General Conformity de minimis thresholds or the daily criteria pollutant thresholds as recommended by the SDAPCD. Therefore, no significant impacts related to air quality are anticipated from the implementation of Alternative B. Moreover, because the proposed action would be below both the daily SDAPCD thresholds and the annual Federal de minimis thresholds for VOCs and NO_x, the action would not impede the SDAB from coming into attainment for O_3, and impacts associated with O_3 would be less than significant.

Implementation of Alternative B would not result in emissions equal to or in excess of the standards outlined in Rule 1501 of the SDAPCD Rules and Regulations. In addition, the project design would ensure compliance with Rule 55 of the SDAPCD Rules and Regulations to prevent or control fugitive dust emissions. Therefore, no significant impacts related to air quality are anticipated from the implementation of Alternative B.

Mitigation Measures

No potential significant impacts are anticipated under Alternative B; therefore, no mitigation measures are required.

4.2.6.1.3 Alternative C

The construction-related equipment, schedule, and practices and potential material transport options described in detail within Section 4.2.6.2 for Alternative B would also be implemented under Alternative C. However, an additional 54,000 cubic yards of soil would be transported from the Otay River Floodplain Site to the Pond 15 Site under Alternative C. As a result, the time and equipment needed to excavate and transport the extra material from the Otay River Floodplain Site to the Pond 15 Site, as well as contour grade the Pond 15 Site, would increase. For example, transport of this additional material between the Otay River Floodplain Site and the Pond 15 Site would require an additional 4,500 truck trips to and from the Pond 15 Site, representing an additional 31,500 miles traveled over what is proposed in Alternative B. Tables 4.2-6 through 4.2-8 provide estimated emissions for implementing Alternative C under each of the three soil transport options.

Table 4.2-6
Estimated Construction Emissions – Alternative C: Truck Transport Option

Construction Year	Pollutant (pounds/day)					
	VOC	*NO_x*	*CO*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
2017	9.09	92.72	149.48	0.20	15.47	9.20
2018	7.19	81.46	138.88	0.18	16.39	9.10
2019	3.27	60.53	73.44	0.13	13.01	8.05
Estimated Emissions (maximum daily)	*9.10*	*92.72*	*149.48*	*0.20*	*16.39*	*9.10*

Table 4.2-6
Estimated Construction Emissions – Alternative C: Truck Transport Option

Construction Year	Pollutant (pounds/day)					
	VOC	*NO_x*	*CO*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
SDAPCD threshold	75	250	550	250	100	55
Exceed threshold?	No	No	No	No	No	No
Construction Year	**Pollutant (tons/year)**					
	VOC	*NO_x*	*CO*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
2017	0.31	3.44	5.46	0.00	0.72	0.42
2018	0.47	5.39	8.77	0.01	1.35	0.78
2019	0.18	3.21	3.96	0.00	0.70	0.43
Estimated Emissions (maximum annual)	*0.47*	*5.39*	*8.77*	*0.01*	*1.35*	*0.78*
De minimis threshold	100	100	100	N/A	N/A	N/A
Exceed threshold?	No	No	No	N/A	N/A	N/A

Source: See Appendix M for complete results.
Note: VOC = volatile organic compounds; NO_x = nitrogen oxides; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; N/A = not applicable.
N/A – General Conformity does not apply to SO_x, PM_{10}, or $PM_{2.5}$ in the SDAB.
Pounds/day – denotes emissions for comparison against SDAPCD thresholds.
Tons/year – denotes emissions for comparison against annual Federal de minimis thresholds.

Table 4.2-7
Estimated Construction Emissions – Alternative C: Conveyor Belt Option

Construction Year	Pollutant (pounds/day)					
	VOC	*NO_x*	*CO*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
2017	5.32	72.65	86.80	0.16	14.03	8.68
2018	3.59	62.88	77.51	0.14	13.09	8.13
2019	3.27	60.53	73.44	0.13	13.01	8.05
Estimated Emissions (maximum daily)	*5.32*	*72.65*	*86.80*	*0.16*	*14.03*	*8.68*
SDAPCD threshold	75	250	550	250	100	55
Exceed threshold?	No	No	No	No	No	No
Construction Year	**Pollutant (tons/year)**					
	VOC	*NO_x*	*CO*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
2017	0.17	2.65	3.25	0.00	0.67	0.40
2018	0.25	4.16	5.15	0.00	1.25	0.74
2019	0.18	3.21	3.96	0.00	0.70	0.43
Estimated Emissions (maximum annual)	*0.25*	*4.16*	*5.15*	*0.00*	*1.2447*	*0.74*
De Minimis Threshold	100	100	100	N/A	N/A	N/A
Exceed Threshold?	No	No	No	N/A	N/A	N/A

Source: See Appendix M for complete results.
Note: VOC = volatile organic compounds; NO_x = nitrogen oxides; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = particulate matter less than or equal to 10 microns; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns; N/A = not applicable.
N/A – General Conformity does not apply to SO_x, PM_{10}, or $PM_{2.5}$ in the SDAB.
Pounds/day – denotes emissions for comparison against SDAPCD thresholds.
Tons/year – denotes emissions for comparison against annual Federal de minimis thresholds.

Table 4.2-8
Estimated Construction Emissions – Alternative C: Pipeline Option

Construction Year	Pollutant (pounds/day)					
	VOC	*NO_x*	*CO*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
2017	14.88	156.12	117.27	0.16	33.29	20.47
2018	11.59	127.61	97.40	0.14	31.28	18.94
2019	0.33	1.60	4.22	0.00	0.57	0.17
2024	9.75	105.05	83.35	0.13	30.08	17.74
Estimated Emissions (maximum daily)	*14.88*	*156.12*	*117.27*	*0.16*	*33.29*	*20.47*
Threshold	75	250	550	250	100	55
Exceed Threshold?	No	No	No	No	No	No
Construction Year	**Pollutant (tons/year)**					
	VOC	*NO_x*	*CO*	*SO_x*	*PM_{10}*	*$PM_{2.5}$*
2017	0.17	2.65	3.25	0.00	0.67	0.40
2018	0.25	4.16	5.15	0.00	1.24	0.74
2019	0.01	0.06	0.16	0.00	0.02	0.00
2024	0.17	3.17	3.83	0.00	0.68	0.42
Estimated Emissions (maximum annual)	*0.25*	*4.17*	*5.15*	*0.00*	*1.24*	*0.74*
De minimis threshold	100	100	100	N/A	N/A	N/A
Exceed threshold?	No	No	No	N/A	N/A	N/A

Source: See Appendix M for complete results.
Note: VOC = volatile organic compounds; NO_x = nitrogen oxides; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = particulate matter less than or equal to 10 microns in diameter; $PM_{2.5}$ = particulate matter less than or equal to 2.5 microns in diameter; N/A = not applicable.
N/A – General Conformity does not apply to SO_x, PM_{10}, or $PM_{2.5}$ in the SDAB.
Pounds/day – denotes emissions for comparison against SDAPCD thresholds.
Tons/year – denotes emissions for comparison against annual Federal de minimis thresholds.

As shown, daily construction emissions would not exceed the thresholds for any of the criteria air pollutants: VOC, NO_x, CO, SO_x, PM_{10}, and $PM_{2.5}$. Additionally, criteria pollutants emissions would not exceed the annual General Conformity de minimis thresholds or the daily criteria pollutant thresholds as recommended by the SDAPCD. Therefore, no significant impacts related to air quality are anticipated from the implementation of Alternative C. Moreover, because the proposed action would be below both the daily SDAPCD thresholds and the annual Federal de minimis thresholds for VOC and NO_x, the action would not impede the SDAB from coming into attainment for O_3, and impacts associated with O_3 would be less than significant.

Similarly to Alternative B, implementation of Alternative C would not result in emissions equal to or in excess of the standards outlined in Rule 1501 of the SDAPCD Rules and Regulations. In addition, the project design would ensure compliance with Rule 55 of the SDAPCD Rules and Regulations to prevent or control fugitive dust emissions. Therefore, no significant impacts related to air quality are anticipated from the implementation of Alternative C.

Mitigation Measures

No significant impacts are anticipated; therefore, no mitigation measures are required.

4.2.6.2 Sensitive Receptors

Significance Threshold: Implementation of the proposed action would have a significant direct impact on air quality if sensitive receptors are exposed to substantial pollutant concentrations, including air toxics such as diesel particulates, or if air contaminants are released beyond the boundaries of the project site; a significant increase in traffic congestion at nearby intersections due to actions associated with the project would represent a significant indirect impact on air quality.

A variety of sensitive receptors surround the general vicinity of the South San Diego Bay Unit of the San Diego Bay NWR, including the San Diego Bay NWR itself. These receptors include a mobile home park located to the south of the Otay River Floodplain in the City of San Diego, residential uses and an elementary school located along the south end of the San Diego Bay in the City of Imperial Beach, residential units scattered among small industrial uses to the east of Pond 15, and residential development located just to the west of the San Diego Bay NWR boundaries in the City of Coronado.

4.2.6.2.1 Alternative A

Under Alternative A, no grading or other construction activities would occur, and no sensitive receptors would be exposed to substantial pollutant concentrations.

Under this alternative, the Otay River Floodplain Site would remain undeveloped, inaccessible to the public, and generate a minimal number of vehicle trips associated with San Diego Bay NWR maintenance activities. Vehicle trips associated with South Bay Salt Works operations would remain consistent with the existing condition. This alternative would not result in any additional trip generation; therefore, this alternative would not result in the formation of CO hotpots. No significant impacts are anticipated.

As such, all impacts for criteria pollutants, toxic air contaminants, CO hotspots, and sensitive receptors would be similar to the proposed action and would not be significant impacts under NEPA.

Mitigation Measures

No significant impacts are anticipated under Alternative A; therefore, no mitigation measures are required.

4.2.6.2.2 Alternative B

Diesel Particulate Matter

With regard to toxic air contaminants and sensitive receptors, diesel exhaust particulate matter would be emitted from heavy equipment and trucks used in the construction and sediment transport process. Because diesel exhaust particulate matter is considered to be carcinogenic, long-term exposure to diesel exhaust emissions could result in health impacts. Implementation of Alternative B would result in short-term emissions of diesel exhaust from construction equipment, with construction periods generally occurring between September and February during daytime working hours. The types and uses of the diesel fueled equipment would vary over those times. In addition, heavy earthmoving equipment would be sufficiently separated from sensitive receptors to avoid exposure to diesel exhaust. In addition, the timing of trucks leaving the Otay River Floodplain Site to transport material would be set to avoid surface street congestion near the Pond 15 Site, where sensitive receptors are present within approximately 0.4 miles.

Carbon Monoxide Hotpots

In addition to diesel particular matter, project traffic combined with non-project traffic could result in the formation of microscale CO hotspots in the area immediately around points of congested traffic, which could impact surrounding sensitive receptors. If substantial traffic occurs during periods of poor atmospheric ventilation, consists of a large number of vehicles "cold-started" and operating at pollution-inefficient speeds, and is operating on roadways already crowded with non-project traffic, there is a potential for the formation of microscale CO hotspots in the area immediately around points of congested traffic. Because of continued improvement in vehicular emissions at a rate faster than the rate of vehicle growth and/or congestion, the potential for CO hotspots in the SDAB is steadily decreasing (CARB 2004).

Additionally, CO transport is extremely limited and disperses rapidly with distance from the source. Typically, high CO concentrations are associated with roadways or intersections operating at an unacceptable level of service. The City of San Diego *California Environmental Quality Act (CEQA) Significance Determination Thresholds* guidance provides screening thresholds and project examples to determine if a site-specific CO hotspots analysis should be performed (City of San Diego 2011). The following are examples of projects that could potentially trigger the need for a site-specific CO hotspots assessment:

- 950 single-family units (9,500 average daily trips) in areas of the City of San Diego where traffic flow is not below (worse than) level of service C and where development is not located within 100 feet of a congested freeway

- 500 single-family units (5,000 average daily trips) where individual residential units contain wood-burning fireplaces that would be used on average 50 days per year

Using the City of San Diego's guidance as a basis for this analysis, the only construction method under the proposed action that would potentially be subject to a CO hotspot assessment would be the haul truck transportation option, because the conveyance method and slurry method would not generate substantial trips such that a CO hotspot assessment would be warranted. Under the haul truck transportation option, it was conservatively estimated that the proposed action would generate approximately 50 construction worker trips and 20 vendor trips or material deliveries per day throughout the construction period. Additionally, approximately 206 one-way truck trips (about 7 miles round-trip; 3.5 miles one-way) per day would be required to transport 129,000 cubic yards of fill material between the Otay River Floodplain Site and the Pond 15 Site during each of the earthwork phases. All construction-related trips would be phased to occur during times that would reduce traffic impacts to surrounding roadways (e.g., construction workers would arrive in the morning before commencement of daily construction activities, material deliveries would be intermittent and only occur when necessary, and haul truck trips would occur steadily throughout the workday). Therefore, the proposed action would generate approximately 276 trips at various times throughout the day under the truck haul transportation option, which would be well below the City's screening threshold of 9,500 trips per day and 5,000 trips per day per the City's screening example, as noted previously.

Moreover, 40 CFR, Part 93.123(c)(5) states, "CO, PM_{10}, and $PM_{2.5}$ hot-spot analyses are not required to consider construction-related activities which cause temporary increases in emissions. Each site which is affected by construction-related activities shall be considered separately, using established 'Guideline' methods. Temporary increases are defined as those which occur only during the construction phase and last five years or less at any individual site."

Construction of the proposed action would commence in August 2017 and would be completed in December 2020. Because construction of the proposed action is expected to last less than 5 years, construction-related emissions from the action are not considered in the project-level or regional conformity analysis, and a hot-spot analysis is not required for construction of the proposed action. Additionally, although the slurry construction method would extend beyond a 5-year time frame, this method (similar to the conveyance construction method) would not require extensive use of haul trucks that may result in a CO hotspot impact on a local roadway; therefore, a CO hotspot analysis would not be required for either the conveyance construction method or the slurry construction method.

Following completion of the proposed action, San Diego Bay NWR staff and other biological monitors would periodically visit both of the sites as part of ongoing monitoring and management of the restored wetlands. The total number of trips to the project sites would be

similar to existing conditions, which are minimal. Therefore, future activities on the site following completion of construction would not result in an increase in trips that could affect air quality. Alternative B would not expose sensitive receptors in the general vicinity of the project site to substantial pollutant concentrations, or result in a significant increase in traffic congestion at nearby intersections.

Mitigation Measures

No significant impacts are anticipated under Alternative B; therefore, no mitigation measures are required.

4.2.6.2.3 Alternative C

Similar to Alternative B with regard to toxic air contaminants and sensitive receptors, diesel exhaust particulate matter generated under Alternative C would be emitted from heavy equipment and trucks used in the construction and sediment transport process. However, under this alternative, construction activity would occur over a longer period, but the intensity of the day-to-day activities would not increase. Therefore, the impacts described under Alternative B would also occur under Alternative C, over an extended period.

Similarly to Alternative B, project traffic combined with non-project traffic could result in the formation of microscale CO "hotspots" in the area immediately around points of congested traffic, which could have a significant impact on surrounding sensitive receptors.

Under the haul truck transportation alternative, it was conservatively estimated that the project would generate approximately 50 construction worker trips and 20 vendor trips or material deliveries throughout the construction period. Implementation of Alternative C would require approximately 249 one-way truck trips (about 7 miles round-trip; 3.5 miles one-way) per day to transport 156,000 cubic yards of fill material proposed between the Otay River Floodplain Site and the Pond 15 Site during each of the two earthwork phases. Therefore, the proposed action would generate approximately 319 trips per day under the truck haul transportation option and would be well below the City of San Diego's screening threshold of 9,500 trips per day and 5,000 trips per day per the example projects, as noted in Section 4.2.6.2.2.

Construction of the proposed action would commence in August 2017 and would be completed in December 2020. Because construction is expected to last less than 5 years, the proposed action's construction-related emissions are not considered in the project-level or regional conformity analysis, and a hot-spot analysis is not required for construction of the proposed action.

Therefore, Alternative C would not expose sensitive receptors within the general vicinity of the project site to substantial pollutant concentrations, or result in a significant increase in traffic congestion at nearby intersections.

Mitigation Measures

No significant impacts are anticipated under Alternative C; therefore, no mitigation measures are required.

4.2.7 Noise

Significance Threshold: Noise generated by the proposed action that exceeds the affected city's noise standards at the project's property line would be considered a significant impact.

The City of San Diego's noise ordinance, Municipal Code Section 59.5.0404, states that it is unlawful to engage in construction activities between the hours of 7 p.m. of any day and 7 a.m. of the following day, or on legal holidays (City of San Diego 2010). Residential uses south of the San Diego Bay in the City of Imperial Beach have construction noise limits of 75 A-weighted decibels (dBA) for any use, and prohibit construction from 10 p.m. to 7 a.m. Residential uses in the City of Coronado have a construction noise limit of 7 p.m. to 7 a.m.

4.2.7.1 Alternative A

Noise levels on the Otay River Floodplain Site are influenced most heavily by aircraft activity, boating on San Diego Bay, vehicular traffic on I-5 and State Route 75, and pedestrians and bicyclists using the Bayshore Bikeway. Noise levels on the Pond 15 Site are influenced by the South Bay Salt Works operation. Under this alternative, the current uses and activities on the project site would not change; therefore, current noise levels would not increase from the existing conditions. Current operations on the San Diego Bay NWR do not exceed the noise standards of the surrounding municipalities. Therefore, no significant impacts related to noise are anticipated under this alternative.

Mitigation Measures

No significant impacts are anticipated under Alternative A; therefore, no mitigation measures are required.

4.2.7.2 Alternative B

Construction activities proposed under this alternative would result in a temporary increase in ambient noise levels on the project site on an intermittent basis. The noise levels generated by the proposed construction activity would vary greatly depending upon the type of equipment

being operated at any one time. The average sound level of the construction activity also depends on the amount of time that the equipment operates and the intensity of construction during that period. Further, the noise level perceived by nearby receptors would vary depending on the distance between the receptor and the noise source(s).

The maximum noise levels for various pieces of construction equipment at a distance of 50 feet are depicted in Table 4.2-9. The *average* sound level at a construction site is typically less than the *maximum* noise level because the various types of equipment operate in alternating cycles of full power and low power, and equipment would be continually moving around the site (i.e., construction equipment would not remain in one place for an extended period). As shown in Table 4.2-9, noise levels generated by heavy construction equipment can range from 80 dBA to 89 dBA when measured at 50 feet.

Table 4.2-9
Construction Equipment Noise Levels

Equipment	Typical Maximum Noise Level (dBA) 50 Feet from Source
Backhoe	80
Compactor	82
Conveyor belt	81
Dozer	85
Grader	85
Loader	85
Scraper	89
Haul trucks	88

Source: FTA 2006.

These noise levels diminish rapidly with distance from the construction site at a rate of approximately 6 dBA per doubling of distance (U.S. Department of Labor 2016).

Construction associated with this alternative would involve excavation and redistribution of material at both the Otay River Floodplain Site and the Pond 15 Site. In addition, material would be transported along public streets from the Otay River Floodplain Site to the Pond 15 Site, as indicated on Figure 2-2. The nearest sensitive receptors to the Otay River Floodplain Site are the residential uses located less than 0.1 miles to the southwest (approximately 400 feet from the project boundary). No sensitive receptors occur in proximity to the Pond 15 Site. There are sensitive receptors, including scattered residential units, located on Stella Street and Ada Street, with some units located approximately 150 feet to the east of the proposed haul road route.

Conservatively, if noise levels reach the higher end of the noise spectrum shown in Table 4.2-9 (which represent maximum noise levels) at 89 dBA at 50 feet during construction, and noise levels decrease at a rate of 6 dB per doubling distance as previously stated, approximate noise

levels during construction would be as follows: 89 dBA at 50 feet, 83 dBA at 100 feet, 77 dBA at 200 feet, and 71 dBA at 400 feet. Therefore, maximum noise levels at the nearest sensitive receptor would be approximately 71 dBA, which is below the City of San Diego and City of Imperial Beach's noise standard of 75 dBA. Thus, noise levels on the project site could reach up to 93 dBA and noise levels at the nearest sensitive receptor would not exceed the 75 dBA standard. Although construction noise is anticipated to be under 75 dBA at the nearest sensitive receptor, construction BMPs as described in MM-NOI-1 would be implemented during construction activities.

Under Alternative B, the selected contractor would follow both City of San Diego and City of Imperial Beach time restrictions for construction equipment operation, and hauling of material from the Otay River Floodplain Site to the Pond 15 Site would take place Monday through Saturday from 7 a.m. to 7 p.m. Work would not occur on holidays because this is restricted in both cities. Limiting all construction-related activities to these hours would minimize the potential for increased noise levels for sensitive receptors.

In addition, construction activities would be scheduled around the bird nesting season. This is to ensure that noise associated with construction equipment would not affect nesting. For details regarding noise impacts on biological resources, see Chapter 4.3, Biological Resources. The contractor would identify BMPs such as making sure all construction equipment has been maintained and is working properly to reduce construction-related noise, particularly truck noise during material transport. Due to the lack of sensitive receptors within 50 feet, discontinuation of work during the nesting season, and the implementation of BMPs, the construction noise level is anticipated to comply with all applicable noise standards of the surrounding jurisdictions.

Because the proposed construction activity is associated with habitat restoration, once construction has been completed, noises levels on the site would be minimal. The ambient noise level would return to levels less than or equal to the existing conditions. Implementation of Alternative B would not generate noise levels at the property line in excess of the affected city's noise standards during or after construction; therefore, noise impacts would be less than significant. Although construction noise is anticipated to be under 75 dBA at the nearest sensitive receptor, construction BMPs as described in MM-NOI-1 would be implemented during construction activities.

Mitigation Measures

To minimize the potential for noise impacts to sensitive receptors, the following mitigation measure has been incorporated into the scope of the project:

MM-NOI-1

a. Construction plans shall indicate that the hauling of material from the Otay River Floodplain Site to the Pond 15 Site is not permitted on Sundays or between the hours of 7 p.m. and 7 a.m

b. All construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers.

c. Construction noise reduction methods, such as shutting off idling equipment, maximizing the distance between construction equipment staging areas and occupied residential areas, and use of electric air compressors and similar power tools rather than diesel equipment, shall be used.

d. During construction, stationary construction equipment shall be placed such that emitted noise is directed away from or shielded from sensitive noise receptors.

e. During construction, stockpiling and vehicle staging areas shall be located as far as practical from noise-sensitive land uses.

Implementation of MM-NOI-1 would ensure noise impacts during construction would be less than significant.

4.2.7.3 Alternative C

The potential noise impacts from the implementation of Alternative C would be very similar to those described for Alternative B. Construction would result in increase in ambient noise levels on the project site on an intermittent basis. Under this alternative, the number of daily truck trips traveling back and forth between the Otay River Floodplain Site and the Pond 15 Site to transport material would be higher than under Alternative B. This would result in a marginal increase in noise to sensitive receptors along the haul route. As described under Alternative B, noise levels at the nearest sensitive receptor are anticipated to be below the City of San Diego's and City of Imperial Beach's noise standard of 75 dBA; however, should noise levels increase beyond that shown in Table 4.2-9, MM-NOI-1 is provided. Implementation of MM-NOI-1 would reduce noise impacts to a level that is less than significant. Once construction has been completed, noise levels on the site would be minimal. Therefore, the potential for impacts associated with noise would also remain less than significant under Alternative C.

Mitigation Measures

MM-NOI-1, as described under Alternative B, would be implemented under Alternative C.

4.2.8 Climate Change/Sea-Level Rise

Global climate change is a cumulative impact. A project contributes to this potential impact through its incremental GHG production combined with the cumulative increase of all other sources of greenhouse gases (GHGs). Thus, GHG impacts are recognized as exclusively cumulative impacts; there are no noncumulative GHG emission impacts from a climate change perspective (CAPCOA 2008). This approach is consistent with that recommended by the California Natural Resources Agency, which noted in its Public Notice for the proposed CEQA amendments that the evidence indicates in most cases, the impact of GHG emissions should be considered in the context of a cumulative impact, rather than a project-level impact (CNRA 2009).

The Council on Environmental Quality (CEQ) issued Final GHG guidance on August 1, 2016, to assist Federal lead agencies with GHG significance determinations under NEPA associated with Federal actions. The guidance states that CEQ "does not establish any particular quantity of GHG emission as 'significantly' affecting the quality of the human environment or give greater consideration to the effects of GHG emissions and climate change over other effects on the human environment" (CEQ 2016). As such, the adopted 2016 CEQ guidance does not specify a numeric threshold under which a proposed project as quantitatively analyzed under NEPA would be considered less than significant. The guidance recommends GHG emissions be quantified and disclosed (if quantification of emissions is feasible) and supplemented with a qualitative analysis of the project's contribution to and effect on global climate change.

Additionally, the State of California has adopted emission-based thresholds for GHG emissions. The Governor's Office of Planning and Research issued a technical advisory titled *CEQA and Climate Change: Addressing Climate Change through California Environmental Quality Act (CEQA) Review*, which states that public agencies are encouraged but not required to adopt thresholds of significance for environmental impacts. Even in the absence of clearly defined thresholds for GHG emissions, the law requires that such emissions from projects must be disclosed and mitigated to the extent feasible whenever the lead agency determines that the project contributes to a significant cumulative climate change impact (OPR 2008).

The following discussion discloses how the proposed alternatives may affect or may be affected by climate change and sea-level rise. This analysis is consistent with the guidance provided in the California Coastal Commission-adopted Sea Level Rise Policy Guidance (Commission 2015), which contains guiding principles for addressing sea-level rise in the coastal zone.

The National Research Council's report titled *Sea-Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future* 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 between 1.56

and 11.76 inches by 2030, and an increase of between 4.68 and 24 inches by 2050 (NRC 2012). These projections, which are based on global and regional sea-level projections, started with several of the basic scenarios that have been the foundation of the Intergovernmental Panel on Climate Change's climate projections and then combined projections of steric changes (thermal expansion or contraction) with changes in the amount of ocean water due to melting of land-based ice on Greenland and Antarctica, as well as contributions from other land-based glaciers and ice caps. A probable impact of sea-level rise in an estuary setting is a change in tidal dynamics, including changes to the tidal range. The report identified the transition from intertidal mudflat to coastal salt marsh as especially sensitive to changes in sea level.

Significance Threshold: Consistent with the CEQ guidance, the following factors were considered in addressing the impacts of climate change and sea-level rise: (1) the potential impacts of the proposed action on climate change as indicated by its GHG emissions and (2) the ways in which a changing climate over the life of the proposed action may alter the overall environmental implications of the proposed action. For the purposes of assessing climate change/sea-level rise impacts associated with the proposed action, an analysis was conducted to determine the effects of sea-level rise on vegetation communities and habitat quality under both a 4.68-inch and 24-inch rise in sea level for the year 2050.

4.2.8.1 Alternative A

Based on predicted sea-level rise of approximately 4.68 to 24 inches by 2050, little change to the habitat value of either portion of the project site is anticipated. Under Alternative A, the Pond 15 Site would continue to function as a solar salt evaporation pond and would not be affected even with the 24-inch sea-level-rise scenario due to the presence of levees surrounding the pond. Existing berms surrounding the Otay River Floodplain Site would ensure that sea-level rise would not alter the disturbed habitat on site even under a 24-inch sea-level rise scenario.

No impacts associated with climate change/sea-level rise due to implementation of this alternative are anticipated.

Mitigation Measures

No significant impacts are anticipated under Alternative A; therefore, no mitigation measures are required.

4.2.8.2 Alternative B

Per the California Coastal Commission-adopted Sea Level Rise Policy Guidance (Commission 2015) and to comply with Coastal Act Section 30253, the restoration design for the Otay River Floodplain Site and the Pond 15 Site under this alternative has been planned, located, designed, and engineered to address changing sea levels and associated impacts that might occur over the

life of the project. In addition, project planning has considered the migration and natural adaptation of the restored wetlands due to future sea-level rise conditions, as described below.

The Otay River Floodplain Site allows for additional sea-level-rise adaptation east of the restoration site as there are no existing or planned landform barriers preventing habitat migration toward I-5 in the San Diego Bay NWR. The Otay River Floodplain Site is more sensitive to sea-level rise than the Pond 15 Site due to the predicted amount of vegetated marsh that shifts to mudflat. Both sites are more dramatically affected by the higher 24-inch sea-level rise where the mid and upper elevations of vegetated marsh are reduced. Table 4.2-10 and Table 4.2-11 show the differences in variation between the habitat types under the sea-level-rise projections. Under the 24-inch sea-level-rise scenario, mudflat and low marsh habitat would increase, but mid-marsh and high vegetated marsh habitat would be reduced. With the increased sea level, overall habitat values would decrease as the subtidal habitat increases.

Table 4.2-10
Alternative B (Intertidal) 24-inch Sea-Level Rise Variation – Otay River Floodplain Site

Vegetation Community to be Created	Completion of Construction 2020 (acres)	24-Inch Sea-Level Rise 2050 (acres)
Mudflat, frequently flooded	4.26	14.01
Mudflat, frequently exposed	0.79	2.59
Low salt marsh	8.88	9.81
Mid salt marsh	11.71	3.51
High salt marsh	3.97	0.25
*Total Created Wetland Habitat**	*29.61*	*30.17*
Upland habitat	3.89	3.34
Total*	**33.51**	**33.51**

Source: Appendix J.
Note: * Acreage may not total due to rounding.

Table 4.2-11
Alternative B (Intertidal) 24-inch Sea-Level Rise Variation – Pond 15 Site

Vegetation Community to be Created	Completion of Construction 2020 (acres)	24-Inch Sea-Level Rise 2050 (acres)
Subtidal	10.27	14.20
Mudflat, frequently flooded	16.18	27.56
Mudflat, frequently exposed	2.36	4.33
Low salt marsh	15.58	32.45
Mid salt marsh	34.88	7.54
High salt marsh	5.37	2.25
*Total Created Wetland Habitat**	*84.65*	*88.32*
Upland habitat	6.26	2.58
Total*	**90.90**	**90.90**

Source: Appendix J.
Note: * Acreage may not total due to rounding.

For all possible sea-level rise scenarios, the elevation in which subtidal habitat can occur in the floodplain basin under Alternative B is limited by existing bars, hummocks, and other channel bottom features at the inlet and inside the branch channel into this basin. Under Alternative B, in the event sea level were to rise by 24 inches, a rise in subtidal elevations in Pond 15 would occur. As such, sea-level rise would raise the elevations of all habitat types (Appendix G).

The habitats expected to be supported on the Otay River Floodplain Site under this alternative with 24 inches of sea-level rise, which is currently predicted to occur in about 2050, are shown in Table 4.2-10. On the Pond 15 Site, the habitats anticipated to be supported under this alternative in 2050 are shown in Table 4.2-11. Figure 2-6c through Figure 2-6f characterize the 24-inch sea level rise scenario, and the subsequent impacts of sea-level rise on the Otay River Floodplain Site and Pond 15 Site are consistent with the California Coastal Commission-adopted Sea Level Rise Policy Guidance (Commission 2015).

The impacts of climate change and sea-level rise would not be significant, but they would result in variation in the habitat types proposed for the completion of construction.

Mitigation Measures

No significant impacts are anticipated under Alternative B; therefore, no mitigation measures are required.

4.2.8.3 Alternative C

Potential sea-level rise was also included in the design of the habitat types at both the Otay River Floodplain Site and the Pond 15 Site under Alternative C. The Otay River Floodplain Site is more sensitive to sea-level rise than the Pond 15 Site, as shown in Tables 4.2-12 and 4.2-13.

Tables 4.2-12 and 4.2-13 show the differences in variation in habitat types from the range of projections of sea-level rise. Under the 24-inch sea-level-rise scenario, mudflat and low marsh habitat would significantly increase, but vegetated marsh habitats would be almost completely lost. With the increased sea level, overall habitat values would increase.

Table 4.2-12
Alternative C (Subtidal) 24-inch Sea-Level Rise Variation – Otay River Floodplain Site

Vegetation Community to be Created	Completion of Construction 2020 (acres)	24-Inch Sea-Level Rise 2050 (acres)
Subtidal	4.48	4.48
Mudflat, frequently flooded	4.43	15.04
Mudflat, frequently exposed	2.00	1.48
Low salt marsh	8.34	6.96
Mid salt marsh	6.21	1.99
High salt marsh	3.94	0.36

Table 4.2-12
Alternative C (Subtidal) 24-inch Sea-Level Rise Variation – Otay River Floodplain Site

Vegetation Community to be Created	Completion of Construction 2020 (acres)	24-Inch Sea-Level Rise 2050 (acres)
*Total Created Wetland Habitat**	*29.41*	*30.31*
Upland habitat	4.10	3.20
Total*	**33.51**	**33.51**

Source: Appendix J.
Note: * Acreage may not total due to rounding.

Table 4.2-13
Alternative C (Subtidal) Sea-Level Rise Variation – Pond 15 Site

Vegetation Community to be Created	Completion of Construction 2020 (acres)	24-Inch Sea-Level Rise 2050 (acres)
Subtidal	10.23	14.40
Mudflat, frequently flooded	16.11	24.95
Mudflat, frequently exposed	2.16	2.76
Low salt marsh	12.11	25.78
Mid salt marsh	28.06	17.31
High salt marsh	14.39	3.08
*Total Created Wetland Habitat**	*83.06*	*88.28*
Upland habitat	7.85	2.63
Total*	**90.90**	**90.90**

Source: Appendix J.
Note: * Acreage may not total due to rounding.

For all possible sea level scenarios, the elevation in which subtidal habitat can occur in the floodplain basin under Alternative C is limited by existing bars, hummocks, and other channel bottom features at the inlet and inside the branch channel into this basin. Under Alternative C, in the event sea level were to rise by 24 inches, a rise in subtidal elevations in Pond 15 would occur. As such, sea-level rise would raise the elevations of all habitat types (Appendix G).

Based on projected increases in sea level, the habitats expected to be supported within the Otay River Floodplain Site under Alternative C in 2050 is shown in Table 4.2-12. The habitats expected to be supported in the Pond 15 Site under Alternative C in 2050 are shown in Table 4.2-13. Figure 2-7c through Figure 2-7f characterize the 24-inch sea level rise scenario, and the predicted impacts of sea-level rise on the Otay River Floodplain and Pond 15 Site under Alternative C are consistent with the California Coastal Commission-adopted *Sea Level Rise Policy Guidance* (Commission 2015).

The impacts of climate change and sea-level rise would not be significant, but they would result in variation in the habitat types proposed for the completion of construction. Impacts relating to

implementation of this alternative with respect to affecting climate change are addressed in Section 4.2.9, Greenhouse Gases, of this EIS.

Mitigation Measures

No significant impacts are anticipated under Alternative C; therefore, no mitigation measures are required.

4.2.9 Greenhouse Gases

The Service has not developed a quantitative threshold for determining whether a project's GHG emissions would have a significant impact on the environment. Therefore, the determination of whether the level of GHG emissions associated with the proposed action would have a significant impact on the environment involved consideration of the following factors: (1) the extent to which the project would increase or decrease GHG emissions and (2) whether the project complies with applicable regulations, plans, or policies for reducing GHG emissions.

Section 15064.4 of the CEQA Guidelines outlines how to analyze a project's contribution to GHG emission levels, but it does not establish any specific significance thresholds for GHG impacts. The CEQA Guidelines (Section 15064.4(b)) do, however, list factors that a lead agency should consider when assessing the significance of impacts from GHG emissions on the environment. These factors include the following: the extent to which a project may increase or reduce GHG emissions as compared to the existing environmental setting; whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; and the extent to which the project complies with regulations or requirements adopted to implement a State-wide, regional, or local plan for the reduction or mitigation of GHG emissions. Other factors can and should be considered as appropriate.

The Council on Environmental Quality (CEQ) issued Final GHG guidance on August 1, 2016, to assist Federal lead agencies with GHG significance determinations under NEPA associated with Federal actions. The guidance states that CEQ "does not establish any particular quantity of GHG emission as 'significantly' affecting the quality of the human environment or give greater consideration to the effects of GHG emissions and climate change over other effects on the human environment" (CEQ 2016). As such, the adopted 2016 CEQ guidance does not specify a numeric threshold under which a proposed project as quantitatively analyzed under NEPA would be considered less than significant. The guidance recommends GHG emissions be quantified and disclosed (if quantification of emissions is feasible) and supplemented with a qualitative analysis of the project's contribution to and effect on global climate change.

The South Coast Air Quality Management District (SCAQMD) adopted an interim significance threshold of 10,000 metric tons of carbon dioxide equivalent (MT CO_2E) per year for industrial

projects in December 2008 (SCAQMD 2015). The SCAQMD threshold was adopted after rigorous public vetting. The same threshold value as that adopted by the SCAQMD is also reflected as the "stationary source" threshold in the County of San Diego's Climate Action Plan (CAP) adopted June 2012 (County of San Diego 2012).[1] Subsequently, the County of San Diego, Land Use & Environment Group finalized the *County of San Diego Guidelines for Determining Significance and Report Format and Content Requirements – Climate Change*, effective November 9, 2013. These guidelines include a threshold of 10,000 MT CO_2E per year for stationary sources (e.g., industrial facilities); however, it is intended to apply primarily to the operational GHG emissions from industrial facilities that include stationary sources, such as boilers, stationary engines, and power generation facilities. Accordingly, this threshold would not be appropriate for evaluating the proposed action's GHG emissions, which are primarily associated with construction. In the absence of a specific GHG threshold that would apply to the proposed action, the significance threshold of 10,000 MT CO_2E/year is used to assess the impacts of the significance of the proposed action's GHG emissions in the absence of a rulemaking to establish a GHG emission threshold of significance. In this instance, the proposed action is analyzed using the SCAQMD threshold because the CEQ, the California Air Resources Board, and the SDAPCD have not yet adopted a numeric threshold.

Emissions from the construction phase of the project, including emissions associated with all construction equipment, were estimated using the CalEEMod Version 2013.2.2, available online (www.caleemod.com).[2] For the purposes of modeling, it was assumed that the construction of the proposed action would commence in August 2017 and would be completed in December 2020. This construction period does not account for the intermittent nature of the schedule (construction would be limited to outside the Service's designated core bird-nesting season) or the significant break between the two earthwork phases. Should the pipeline soil movement option be selected, once all the material from the Otay River Floodplain Site has been pumped to the Pond 15 Site, the material would be left in place until final consolidation has been achieved, which could take up to 5 years, ending construction in December 2024. A detailed depiction of the construction schedule—including information regarding subphases, and equipment used during each subphase is provided in Chapter 2.

[1] The County of San Diego CAP was approved and adopted on June 20, 2012; however, on April 29, 2013, the Superior Court deemed the CAP inadequate and ruled the document was improperly adopted. The updated *County of San Diego Guidelines for Determining Significance and Report Format and Content Requirements – Climate Change*, which serves as the supporting documentation for the implementation of the CAP, has been approved, effective November 7, 2013. As such, thresholds and measures described in the CAP as applicable to the project analysis are provided for informational purposes only.

[2] In addition to construction equipment listed in Section 4.2.6, Air Quality, an electric generator would be required to power the conveyor and pipeline operations. Energy use required for generator operations was provided by Everest International Consultants (Lee, pers. comm. 2016).

Significance Threshold: Impacts are considered significant if the proposed action would exceed the SCAQMD's threshold of 10,000 MT CO_2E per year, or conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

4.2.9.1 Alternative A

Under Alternative A, no construction activities would occur; therefore, no GHG emissions would be generated under this alternative other than those associated with the vehicle use by the San Diego Bay NWR to continue to maintain and manage the lands on the project site in their current state. As such, implementation of this alternative would not generate GHG emissions in sufficient quantity to contribute to cumulative global climate change impacts. No significant impacts related to GHG emissions would result from implementation of this alternative. However, the benefits of carbon sequestration that are associated with coastal salt marsh habitat, as addressed under both action alternatives, would not be realized under this alternative.

Mitigation Measures

No significant impacts are anticipated under Alternative A; therefore, no mitigation measures are required.

4.2.9.2 Alternative B

GHG emissions would be associated with construction of the proposed action through use of construction equipment, an electric generator (for conveyor and pipeline options), and vehicle trips. Construction activities would take approximately 2.5 years to complete for the truck soil transport and conveyor belt soil transport options, and approximately 7.5 years to complete for the pipeline soil transport option. Tables 4.2-14 through Table 4.2-16 provide estimated emissions that would be generated during construction of the three soil transport options (truck transport, conveyor belt, and pipeline).

Table 4.2-14
Estimated Construction GHG Emissions: Truck Transport Option

Construction Year	CO_2E Emissions (metric tons per year)
2017	670
2018	1,057
2019	632
Total	**2,359**

Source: See Appendix M for complete results.

Table 4.2-15
Estimated Construction GHG Emissions: Conveyor Belt Option

Construction Year	Equipment Type	CO_2E Emissions (metric tons per year)
2017	Construction Equipment	533
	Generator	761
	2017 Total	*1,294*
2018	Construction Equipment	831
	Generator	761
	2018 Total	*1,592*
2019	Construction Equipment	632
	Total	**3,518**

Source: See Appendix M for complete results.

Table 4.2-16
Estimated Construction GHG Emissions: Pipeline Option

Construction Year	Equipment Type	CO_2E Emissions (metric tons per year)
2017	Construction Equipment	533
	Generator	761
	2017 Total	*1,294*
2018	Construction Equipment	831
	Generator	761
	2018 Total	*1,592*
2019	Construction Equipment	29
2020	Construction Equipment	596
	Total	**3,511**

Source: See Appendix M for complete results.

As discussed previously, the threshold of 10,000 MT CO_2/year is being used to assess the impact of the proposed action's GHG emissions. The highest total construction emissions under the proposed action in any one year for any of the proposed construction options would equal approximately 1,592 MT CO_2E/year. Therefore, the maximum annual construction-related GHG emissions would be below the SCAQMD suggested threshold of 10,000 MT CO_2/year.

Additionally, due to a small amount of construction activity that would be conducted in the 0.79-acre portion of the Pond 15 Site for the inlet/outlet levee breach, the proposed action would be subject to the Port of San Diego's (Port's) CAP (Port 2013). Implementation of the proposed action would consist of creating wetland habitat and would not include the development of physical structures or other infrastructure that would result in a long-term generation of GHG emissions. Construction activities related to the proposed action would result in GHG emissions, which are primarily associated with use of off-road construction equipment, on-road vendor trucks, and worker vehicles. As stated previously, construction activities would take approximately

2.5 years to complete for the truck soil transport and conveyor belt soil transport options, and approximately 7.5 years to complete for the pipeline soil transport option. As such, GHG emissions generated from the proposed action would primarily occur during construction, thus constituting a short-term, one-time generation of emissions as opposed to the generation of long-term annual operational emissions. For these reasons, implementation of the proposed action would not conflict with or impede implementation of the Port's CAP, nor would implementation of the proposed action impede the Port's ability to meet their 2020 and 2035 reduction targets. Therefore, implementation of the proposed action would be consistent with the Port's CAP and impacts would be less than significant.

Moreover, 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. The exact amount of carbon stored by these ecosystems is still an active area of research; however, their loss would result in a decrease in sequestration potential (Pendleton et al. 2012). Unlike other carbon-dense ecosystems, tidal wetlands are believed to 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." Although this beneficial impact has not been quantified for this alternative, it is important to note that there are potential beneficial impacts associated with implementation of the proposed action.

Mitigation Measures

No significant impacts are anticipated under Alternative B; therefore, no mitigation measures are required.

4.2.9.3 Alternative C

Similar to Alternative B, the GHG emissions generated under Alternative C would be associated with construction of the proposed action through use of construction equipment, an electric generator (for conveyor and pipeline options), and vehicle trips. Construction activities would take approximately 2.5 years to complete for the truck soil transport and conveyor belt soil transport options, and approximately 7.5 years to complete for the pipeline soil transport option. Tables 4.2-17 through Table 4.2-19 provide estimated emissions that would be generated during construction of the three soil transport options (truck transport, conveyor belt, and pipeline).

Table 4.2-17
Estimated Construction GHG Emissions: Truck Transport Option

Construction Year	CO_2E Emissions (metric tons/year)
2017	695
2018	1,101
2019	632
Total	**2,429**

Source: See Appendix M for complete results.

Table 4.2-18
Estimated Construction GHG Emissions: Conveyor Belt Option

Construction Year	Equipment Type	CO_2E Emissions (metric tons/year)
2017	Construction Equipment	533
	Generator	761
	2017 Total	*1,294*
2018	Construction Equipment	831
	Generator	761
	2018 Total	*1,592*
2019	Construction Equipment	632
	Total	**3,518**

Source: See Appendix M for complete results.

Table 4.2-19
Estimated Construction GHG Emissions: Pipeline Option

Construction Year	Equipment Type	CO_2E Emissions (metric tons/year)
2017	Construction Equipment	533
	Generator	761
	2017 Total	*1,294*
2018	Construction Equipment	831
	Generator	761
	2018 Total	*1,592*
2019	Construction Equipment	29
2019	Construction Equipment	596
	Total	**3,511**

Source: See Appendix M for complete results.

As discussed previously, the threshold of 10,000 MT CO_2/year is being used to assess the impact of the proposed action's GHG emissions. The highest total construction emissions in any one year for any of the proposed construction options would equal approximately 1,592 MT CO_2E/year. Therefore, the maximum annual construction-related GHG emissions would be below the SCAQMD suggested threshold of 10,000 MT CO_2/year. Similarly to Alternative B,

although no quantitative analysis has been prepared, carbon sequestration is a potential beneficial impact associated with implementation of Alternative C.

Additionally, due to the small amount of construction activity that would be conducted in the 0.79-acre portion of the Pond 15 Site for the inlet/outlet levee breach, the proposed action would be subject to the Port's CAP (Port 2013). Implementation of the proposed action would consist of creating wetland habitat and would not include the development of physical structures or other infrastructure that would result in a long-term generation of GHG emissions. As such, implementation of the proposed action would not conflict with or impede implementation of the Port's CAP, nor would implementation of the proposed action impede the Port's ability to meet their 2020 and 2035 reduction targets. Therefore, implementation of the proposed action would be consistent with the Port's CAP and impacts would be less than significant.

Mitigation Measures

No significant impacts are anticipated under Alternative C; therefore, no mitigation measures are required.

4.2.10 Contaminants

This section addresses the potential ecological effects associated with the presence of contaminants in the soils and sediments of the project site. Consideration of the effects of food chain uptake of contaminants, particularly in sediments, is an important aspect of the analysis because the primary intended outcome of the proposed action is to provide foraging habitat for benthic organisms, fish, and birds. It is necessary to understand the extent of contamination in tidal and intertidal sediments because sediment-borne contaminants pose a risk to the benthic community and to fish and wildlife that rely on benthic biota for food, especially the Federally endangered light-footed Ridgway's rail (*Rallus obsoletus levipes*) and California least tern (*Sternula antillarum browni*) and Federally threatened western snowy plover (*Charadrius nivosus nivosus*).

Significance Threshold: Adverse effects related to contaminants would be considered significant if the project would create a potential human or biological health hazard, substantially degrade the quality of the environment, and/or impair critical functions (e.g., breeding, foraging) as the result of the transport, use, or disposal of soils or sediments in which contaminants have been identified.

4.2.10.1 Alternative A

As described in Section 3.2.10, Contaminants, both the Otay River Floodplain Site and the Pond 15 Site contain various levels of organic and inorganic contaminants in surface soils or

sediments, and in some cases the contamination extends below the surface. Alternative A proposes no disturbance of soils or sediments on the project site; therefore, mobilization of contaminants, particularly DDTs, and/or exposure of organisms to contaminants would be no different than the potential for exposure under existing conditions.

However, there would continue to be the potential for mobilization of contaminants, specifically DDTs, as a result of the erosion of DDT-contaminated soils from the eastern portion of the Otay River floodplain into the Otay River channel and San Diego Bay during a significant flood event. This is a concern because sediment-borne DDT and its metabolites (especially p,p'-DDE) can be toxic to directly exposed benthic organisms, and to indirectly exposed aquatic-dependent wildlife. Sediment-borne DDT and metabolites are known to enter and accumulate in the tissues of aquatic food web organisms. Through bioaccumulation and biomagnification (with trophic transfer), concentrations of DDT and metabolites can reach levels in tissues of aquatic food chain organisms that are unsafe for wildlife that rely on the aquatic biota for food. Deposition flux and deposition thickness simulations following a 100-year flood event under existing site conditions were conducted for Alternative A to determine the fate of soils in the eastern portion of the Otay River floodplain that contain high concentrations of DDT (Appendix I).

Sediment coring data indicate that the depth of erosion in the area of soils containing DDT (portions of the Otay River floodplain located to the east of Nestor Creek) might vary between 1 and 3 feet, and the average concentrations of DDT in the eroded soils could vary between 310 micrograms per kilogram (µg/kg) and 790 µg/kg, depending on the depth of erosion. DDT is hydrophobic and can only be adsorbed and transported by silt and clay fractions in soils. These fine-grained fractions are transported as suspended load (commonly referred to as "wash load"). As floodwaters travel down the Otay River watershed, wash load (estimated at 438,000 cubic yards) from upstream of the project site is expected to mix with the contaminated sediments (at 24,260 to 128,300 cubic yards, depending on erosion depth) in the Otay River floodplain, diluting the concentration of DDTs in the total suspended sediment load. Modeling indicates that under a scenario in which the maximum flood-induced erosion depth of 3 feet in the contaminated area of the Otay River floodplain is mixed with 438,000 cubic yards of fine-grained sediments from upstream erosion of the portion of the watershed below Savage Dam, the dry bulk DDT concentrations everywhere in the post-flood deposition would be 70.2 µg/kg. The initial post-flood suspended sediment concentration is the same in all areas of the floodplain and salt pond complex because the 100-year flood overtops and flows through these areas with its wash load. Various scenarios were modeled, as presented in Appendix I, and the scenario described here (i.e., maximum erosion of 3 feet of contaminated soils) represents the worst-case scenario when assuming the contaminated soils are fully mixed with fine-grained sediments from upstream of the project site.

Three scenarios were also modeled that considered a situation in which no erosion of soils in the portion of the watershed upstream of the Otay River Floodplain Site and below Savage Dam (Lower Otay Lake) would occur. Under these scenarios, DDT deposition would be based on three possible erosion depths (1 foot, 2 feet, and 3 feet) in the DDT-contaminated area of the floodplain; no mixing of upstream sediments was assumed. The dry bulk total amount of DDT in the post-flood deposition under the worst-case scenario (a 3-foot erosion depth) would increase to 310 µg/kg dry weight (dw), while the deposition thickness would be greatly diminished.

The effects under both worst-case scenarios presented above on the recently restored Ponds 10 and 11 for the 100-year flood under the no-project alternative are summarized in Table 4.2-20. Deposition thickness would be similar throughout the Otay River channel, overtopped salt ponds, and southern end of San Diego Bay. As indicated, the final post-flood deposition thickness would be considerably thinner as a result of sediment consolidation.

Table 4.2-20
Sensitivity Analysis of Potential DDT Deposition in Ponds 10 and 11 for Alternative A, Post-100-Year Flood

Scenario	Vol. of Eroded DDT-Bearing Fines	Avg. DDT Conc. in DDT-Bearing Fines	Vol. of Eroded Upper Watershed Fines	Flood Flow Volume	Suspended Sediment Concentration	Initial Post-Flood Deposition Thickness (200 g/L mud)	Final Post-Flood Deposition Thickness (1,200 g/L mud)	DDT Conc. in Post-Flood Mud Deposition (dry bulk)
Erode top 3 ft Contaminated Area + Upper Watershed	128,300 cy	310 µg/kg	438,000 cy	24,290 AF	23.15 g/L	3.4–3.7 mm	0.5–0.6 mm	70.2 µg/kg
Erode top 3 ft Contaminated Area Only	128,300 cy	310 µg/kg	0 cy	24,290 AF	5.25 g/L	0.74–0.78 mm	0.17–0.18 mm	310 µg/kg

Source: Appendix I.
Notes: vol. = volume; conc. = concentration; g/L = grams per liter; ft = feet; cy = cubic yards; µg/kg = milligrams per kilogram; AF = acre-feet; mm = millimeters.

The potential for impacts to benthic organisms and the prey base for aquatic-dependent wildlife and the potential for bioaccumulation of these compounds to result in impacts on the aquatic-dependent birds that are expected to be supported in the areas affected by post-flood deposition of DDT-bearing fines were also evaluated. In evaluating these concerns, the concentration of DDTs in the deposited materials and how the deposited materials would result in exposure by the benthic organisms were considered. In the short term, while deposited sediments are consolidating, population level impacts to benthic organisms are expected to be limited in nature and extent (Appendix I). Under the worst-case erosion scenario, once post-flood muddy deposits have compacted and consolidated, the DDT concentrations in the top 20 millimeters of muddy

sediment are expected to be between the effects range low (ERL) and the effects range median (ERM), and close to the ERL for the top 40 and 80 millimeters of sediment (in consideration of different burrowing depths of different benthic organisms). Therefore, the negative effects are expected to be rare and the final post-flood condition is not likely to have a measurable effect on the prey base for aquatic-dependent species (Appendix I). In regard to the aquatic-dependent birds' exposures to contaminated prey, impacts are unlikely to result from the anticipated deposition of DDT-contaminated sediments following a 100-year flood event (Appendix I).

Mitigation Measures

Impacts under Alternative A would be less than significant; therefore, no mitigation measures are required.

4.2.10.2 Alternative B

Under Alternative B, the western portion of the Otay River floodplain would be excavated, with a portion of the material transported to the Pond 15 Site and the remainder stored on the eastern portion of the Otay River Floodplain Site for future use. In addition, some excavation on the Pond 15 Site would occur to achieve the tidal, intertidal, and upland elevations proposed in the restoration plans. Earthwork associated with construction of the proposed action would redistribute any existing contaminants in the affected soils and sediments. As described in Section 3.2.10, portions of the Otay River floodplain east of Nestor Creek have concentrations of copper, lead, and zinc that appear elevated, compared with soils from west of Nestor Creek. Soils from east of Nestor Creek also have high concentrations of organochlorine pesticides, primarily DDT (Appendix I). To avoid potential adverse effects related to contaminants, initial plans for restoring the Otay River Floodplain Site, as described in Section 2.4, Alternatives Considered but Eliminated from Detailed Analysis, were revised to include only the 30 acres located to the west of Nestor Creek, where no pesticides or polychlorinated biphenyls were detected and concentrations of metals were lower. The revised plans eliminated any proposals for excavation in areas with elevated concentrations of certain metals and high concentrations of DDT, thereby avoiding the potential for risks to aquatic biota and aquatic-dependent wildlife in the restored habitat. However, the 21.5 acres identified on Figure 2-1a east of Nestor Creek would be revegetated to reduce erosion potential in this area.

As noted in Section 3.2.10, contaminant concentrations on the Pond 15 Site are not at levels that would adversely affect habitat quality in the restored pond or the adjacent Bay environment. Under Alternative B, the concentrations of contaminants in Pond 15 sediments, especially when mixed during restoration activities, would be below levels of concern for risk to ecological receptors. Nevertheless, under Alternative B, the total estimated volume of contaminated material (less than 5,000 cubic yards) would be buried in the Pond 15 Site during construction.

Therefore, restoration of Pond 15 would have no effect on contaminant levels pond-wide or in San Diego Bay.

The mobilization of contaminants, specifically DDTs, as a result of the erosion of DDT-contaminated soils during a significant flood event, as described under Alternative A, was also considered for Alternative B. In the event of a 50- or 100-year flood event, eroded sediments would be distributed not only in the Otay River channel, Ponds 10 and 11, and other salt ponds overtopped during the flood event, but also in the tidal basin proposed for the western portion of the Otay River floodplain under Alternative B. To better understand the distribution of contaminants during a flood event, the area was evaluated for the effects of both a 50-year flood event and a 100-year flood event on the downstream distribution of eroded soils containing DDT (Appendix I). Because the duration of the 100-year flood is only 24 hours, the analysis assumed that tidal exchange would be quickly reestablished once the floodwaters recede and that the transport and settling dynamics of potentially contaminated silts and clays would be driven and limited by the tidal hydraulics and tidal residence times.

As described in greater detail in Appendix I, the analysis indicated that the post-100-year flood would result in the deposition of less than 1 millimeter to as much as 8 millimeters of partially consolidated mud in the restored tidal basin, with an average dry bulk DDT concentration of 42 µg/kg dw to 790 µg/kg dw, depending on whether the calculations assume the mixing of clean sediments from upstream with the contaminated sediments on the site and on the depth of erosion that occurs. If unmixed with upstream sediments, the DDT concentrations in the muds deposited in the basin could range between 310 µg/kg dw and 790 µg/kg dw, but the deposition thicknesses would reduce to only fractions of a millimeter once these muds become consolidated. Using a depth-proportional exposure approach, and assuming that all exposure occurs within the top 20 millimeters under worst-case conditions, the DDT concentration experienced by the benthic biota would range from approximately 13 µg/kg dw to 29 µg/kg dw initially and would decrease with compaction and consolidation to a final 20-millimeter-based dry bulk concentration of 4.2 µg/kg dw to 7.9 µg/kg dw.

Under the 50-year flood, DDT concentrations would be higher than the comparison results for the 100-year flood because proportionally less erosion would occur in the upper watershed of the Otay River than predicted during a 100-year flood. The post-flood DDT concentrations in the muds (silts and clays) deposited in the tidal basin under the 50-year flood could be as high as 111 µg/kg dw. When no upstream erosion is assumed (worst case), post-flood DDT concentrations in the deposited muds under a 50-year flood are estimated at 790 µg/kg dw, with deposition thicknesses reducing to only fractions of a millimeter once the muds become consolidated. Using a depth-proportional exposure approach within the top 20 millimeters, the DDT concentration experienced by the benthic biota would range from approximately 12 µg/kg dw to 26 µg/kg dw (worst case) initially after the 50-year flood and would decrease with compaction and

consolidation to a final 20-millimeter-based dry bulk concentration of 4.0 µg/kg dw to 7.1 µg/kg dw (worst case).

For the 100-year flood, the floodplain tidal basin proposed under Alternative B, which would have a 2-day residence time, would have low peak deposition flux (16.5 tons/acre/day) and a short deposition period (~120 hours). As a result, the tidal basin would accumulate only 3.3 to 3.4 millimeters of partially consolidated mud after 276 hours post-flood. The tidal residence time would be nearly a day longer for the Pond 15 tidal basin, approximately 3.2 days under Alternative B. Consequently, deposition fluxes and thickness would be notably greater than in the floodplain tidal basin. In Pond 15 under Alternative B, the deposition flux would peak at 19.9 tons/acre/day, and the deposition period would be about 150 hours post-flood. Deposition thickness in Pond 15 would be nearly double that expected in the floodplain tidal basin, with an estimated depth of 8.0 millimeters of partially consolidated mud laid down after 276 hours post-flood under Alternative B.

As described under Alternative A, impacts to benthic organisms could occur occasionally during the short term; however, given the likelihood of effects combined with the short-term nature of this condition, population-level impacts are expected to be limited in nature and extent. Once post-flood muddy deposits have compacted and consolidated in the restored areas, the DDT concentrations in the top 20 millimeters of muddy sediment would be very close to the ERL, and even lower for the top 40 millimeters and top 80 millimeters of sediment; therefore, negative effects are expected to be rare. This condition is not likely to have a measurable effect on the prey base for aquatic-dependent species. Further, impacts on aquatic-dependent birds are unlikely to result from the anticipated deposition of sediments following either a 100-year or a 50-year flood event. For these reasons, impacts would be less than significant.

Mitigation Measures

Impacts under Alternative B would be less than significant; therefore, no mitigation measures are required.

4.2.10.3 Alternative C

The potential for erosion of the DDT-contaminated soils located to the east of Nestor Creek under Alternative C would be essentially the same as that described under Alternatives A and B; however, the residence time (2.5 days), peak deposition flux (18.3 tons/acre/day), and expected accumulation of partially consolidated mud (3.4 millimeters) after 276 hours post-flood in the deeper Otay River floodplain tidal basin, as proposed under Alternative C in a 100-year flood and assuming upstream erosion of soils, would all be slightly higher than those predicted for Alternative B.

The effects of the 100-year flood in Pond 15 under Alternative C (assuming upstream erosion of soils) are also slightly different from those described under Alternative B. Because more material would be deposited in Pond 15 under Alternative C, storage volume and residence times (3 days) in Pond 15 would be reduced, resulting in slightly less deposition flux (18.9 tons/acre/day) and thickness (7.6 millimeters of partially consolidated mud laid down after 276 hours post-flood).

Under a worst-case scenario in which the calculations for a 100-year flood do not include any upstream erosion of clean sediment and all erosion is calculated from within the project site, the dry bulk total amount of DDT in the post-flood deposition would increase to 310 µg/kg dw, but the deposition thickness would be greatly diminished. The deposition period would be approximately 150 hours with peak deposition flux of 4.1 tons/acre/day, and expected accumulation of partially consolidated mud of 0.77 millimeters after 276 hours post-flood in the deeper Otay River floodplain tidal basin. In Pond 15, peak deposition flux would be 4.3 tons/acre/day, and the expected accumulation of partially consolidated mud is 1.7 millimeters after 276 hours post-flood.

Similar to Alternative B, anticipated DDT concentrations in the Otay River floodplain tidal basin during a 50-year flood when on-site sediments are mixed with clean sediment from upstream would be approximately 110 µg/kg dw. Because the DDT deposition results for the 50-year flood are calculated to be within the range of those for the 100-year flood, potential impacts to the wetland ecology are comparable under both scenarios.

As described under Alternative A, impacts to benthic organisms are expected to be limited in nature and extent. Once post-flood muddy deposits have compacted and consolidated in the restored areas, the DDT concentrations in the top 20 millimeters of muddy sediment would be between the ERL and the ERM, and even lower for the top 40 millimeters and top 80 millimeters of sediment; therefore, negative effects are expected to be rare. Impacts on aquatic-dependent birds are unlikely to result from the anticipated deposition of sediments following either a 100-year or a 50-year flood event; therefore, impacts would be less than significant.

Mitigation Measures

Impacts under Alternative C would be less than significant; therefore, no mitigation measures are required.

4.3 BIOLOGICAL RESOURCES

This section describes the impacts of the Otay River Estuary Restoration Project (ORERP or proposed action) on the habitat and vegetation, wildlife and fisheries, and endangered and threatened species supported on and in the immediate vicinity of the project site. Descriptions of the vegetation communities, plants, wildlife (e.g., birds, mammals, reptiles, and terrestrial and marine invertebrates), fish, and listed and sensitive species for the San Diego Bay National Wildlife Refuge (NWR) are provided and quantified in Section 3.3, Biological Resources.

With the exception of Alternative A (the no action alternative), implementation of the proposed action may result in temporary disturbance and/or permanent loss of vegetation communities and listed or sensitive plant and wildlife species. Temporary disturbance includes short-term impacts associated with construction such as earthwork to create restoration area contours (excavation, grading, and filling), construction of staging areas and new access roads, and improvements to existing access roads. Permanent disturbances include long-term impacts that would remain throughout the life of the proposed action, such as berm installations, levee modifications, and the restoration areas, as described in Chapter 2, Alternatives.

The subtidal and intertidal wetland habitats that would be created under Alternative B or Alternative C were designed to be self-sustaining and are expected to require little maintenance except during initial establishment. Initial maintenance would be limited to ensuring that native plant species installed within low, mid, and high coastal salt marsh elevations become established so that they can reproduce and spread naturally, with the goal being creation of self-sustaining wetland habitats and some upland habitat supported by natural weather conditions (Appendix C, Final Restoration Plan).

For the purposes of analyzing impacts to biological resources, the project site includes the 33.51-acre Otay River Floodplain Site, the 90.90-acre Pond 15 Site, and additional project features required to facilitate restoration, as illustrated on Figure 2-1a and outlined in detail in Section 2.3.2, Features Common to Both Action Alternatives, of this environmental impact statement (EIS). Detailed discussions of the proposed action's impacts on biological resources within the project site are provided in this section.

4.3.1 Impacts on Habitat and Vegetation Communities, Including Jurisdictional Wetlands and Waters

For the purposes of this analysis, potential impacts to habitat and vegetation communities are defined as potential impacts to both vegetation communities and jurisdictional wetlands and waters. Direct impacts would result from ground-disturbing activities that remove vegetation or fill jurisdictional waters, and indirect impacts would result from changes to vegetation communities or jurisdictional waters that are incidental to the proposed activities and that could have an impact outside of the project site.

Significance Threshold: An impact to habitat and vegetation would be considered significant if the proposed action would result in the substantial modification of existing habitat or vegetation, including jurisdictional wetlands and waters, within or surrounding the project site.

4.3.1.1 Alternative A

Under Alternative A, no modification of the existing vegetation within the Otay River Floodplain Site, including jurisdictional wetlands and waters regulated by the U.S. Army Corps of Engineers (Corps), would occur, and the existing open water habitat within the Pond 15 Site would remain unchanged. As a result of implementing this alternative, no significant impacts to existing habitat or vegetation on the site would occur. Also under this alternative, the long-term benefits associated with coastal wetland restoration within the Otay River Floodplain Site and restoration of tidal influence to the Pond 15 Site would not be realized.

Direct Impacts

Habitat and Vegetation Communities/Jurisdictional Waters

Otay River Floodplain Site

Alternative A would leave vegetation communities and land covers, including jurisdictional wetlands and waters, at the Otay River Floodplain Site in their current state. Periodic maintenance, such as mowing, would continue to occur on the Otay River Floodplain Site in conjunction with ongoing management of the San Diego Bay NWR.

Implementation of Alternative A would not result in any temporary or permanent modification of existing habitat or native vegetation communities. As a result, Alternative A would have no direct, significant impacts on existing habitat or vegetation communities at the Otay River Floodplain Site.

Implementation of Alternative A would not result in any direct permanent impacts to jurisdictional waters associated with the Otay River channel or Otay River Floodplain Site. No regulatory permits from the Corps under Section 404 of the Clean Water Act, the California Coastal Commission (Commission) under the Federal Coastal Zone Management Act, or the Regional Water Quality Control Board (Regional Board) under Section 401 of the Clean Water Act would be required. As a result, Alternative A would have no direct significant or beneficial impacts on jurisdictional wetlands or waters at the Otay River Floodplain Site.

Pond 15 Site

Under Alternative A, the Pond 15 Site would remain a part of the larger solar salt operation, and the existing open water habitat and adjacent levee banks would remain unchanged.

The potential direct and indirect impacts to habitat and vegetation communities and jurisdictional wetlands and waters at the Pond 15 Site would be the same as those described for the Otay River Floodplain Site.

San Diego Unified Port District Lands

Impacts for the Port Lands would be the same as those for the Otay River Floodplain Site.

Project Features

Implementation of Alternative A would not include any project features; therefore, no direct impacts would occur to habitat or vegetation communities/jurisdictional wetlands or waters.

Indirect Impacts

Habitat and Vegetation Communities/Jurisdictional Waters

Otay River Floodplain Site

No activities would be implemented under Alternative A that would result in temporary or permanent modification of existing native or non-native vegetation communities adjacent to or downstream from the Otay River Floodplain Site. As a result, Alternative A would have no significant indirect impacts on vegetation communities or habitats in the general vicinity of the Otay River Floodplain Site.

Implementation of Alternative A would not result in significant impacts to jurisdictional waters associated with the Otay River channel or Otay River Floodplain Site. No regulatory permits from the Corps under Section 404 of the Clean Water Act, the Commission under the Federal Coastal Zone Management Act, or the Regional Board under Section 401 of the Clean Water Act would be required. As a result, Alternative A would have no significant indirect impacts on jurisdictional wetlands or waters in the general vicinity of the Otay River Floodplain Site.

Pond 15 Site

Under Alternative A, the Pond 15 Site would remain a part of the larger solar salt operation, and the existing open water habitat and adjacent levee banks would remain unchanged.

The potential indirect impacts to habitat, vegetation communities, and jurisdictional wetlands and waters at the Pond 15 Site would be the same as those described for the Otay River Floodplain Site.

San Diego Unified Port District Lands

Impacts for the Port Lands would be the same as those for the Otay River Floodplain Site.

Project Features

Implementation of Alternative A would not involve any project features; therefore, no indirect impacts would occur to habitat, vegetation communities, or jurisdictional wetlands or waters.

Mitigation Measures

Habitat and Vegetation Communities/ Jurisdictional Waters

No significant direct or indirect impacts on habitat or vegetation communities would result from implementation of Alternative A; therefore, no mitigation measures would be required.

No significant direct or indirect impacts to jurisdictional wetlands or waters would occur under Alternative A; therefore, no mitigation measures would be required.

4.3.1.2 Alternative B

Under Alternative B, habitat restoration activities would require removal of the existing vegetation within a 33.51-acre area in the Otay River Floodplain Site, followed by excavation of this area to achieve elevations capable of supporting intertidal wetland habitat. The excavated material would be used as fill material at the Pond 15 Site to increase the bottom elevation of the pond and allow for a larger area of emergent vegetated coastal salt marsh to be restored than would be possible without the addition of fill soils. The habitat areas within the Otay River Floodplain Site that have been disturbed by past filling and solar salt production would be restored to coastal salt marsh wetlands, and the Pond 15 Site would be restored to tidally influenced subtidal and intertidal wetlands. As discussed in Section 2.3, Alternatives Evaluated in Detail, of this EIS, approximately 30 acres of coastal salt marsh habitat and approximately 3.89 acres of upland habitat would be created at the Otay River Floodplain Site. Approximately 85 acres of coastal salt marsh habitat and mudflat and 6.26 acres of upland habitat would be created at the Pond 15 Site.

A mix of native wetland coastal salt marsh plant species would be planted at both sites to create low, mid, and high salt marsh vegetation communities. A summary of the vegetation communities that would be installed based on anticipated sea level and water depth in 2020 is provided in Table 4.3-1. Tidal hydraulics were analyzed to review the pre-action versus post-action change in Nestor Creek and the Otay River (Appendix G2). The tidal hydraulics modeling results were reevaluated to consider potential proposed action impacts on areas outside the project site, specifically Nestor Creek and the upper reach of the Otay River intertidal zone

upriver from the Bayshore Bikeway Bridge. Based on comparisons of hydroperiod functions pre- and post-action, it was concluded that Alternative B would have a negligible effect on tidal inundation in the upper reach of the Otay River and would result in a slight reduction of tidal muting and an improvement in high water tidal inundation of Nestor Creek. Based on the requirements of the Poseidon Resources Marine Life Mitigation Plan (MLMP; Poseidon 2008), the total densities and numbers of species of fish, macroinvertebrates, and birds are required to be similar to those within similar habitat at a reference location within 4 years of construction. Even though the restored habitat may not be fully mature and occupied by wildlife in the first couple of years, it is anticipated to meet the requirements within the first few years after planting.

Table 4.3-1
Proposed Restoration Vegetation Communities for Alternative B – 2020

Restoration Area	Otay River Floodplain Site (acres)	Pond 15 Site (acres)
Subtidal	0.00	10.27
Mudflat – frequently flooded	4.26	16.18
Mudflat – frequently exposed	0.79	2.36
Low salt marsh	8.88	15.58
Mid salt marsh	11.71	34.88
High salt marsh	3.97	5.37
*Total Created Wetland Habitat**	*29.61*	*84.65*
Upland habitat	3.89	6.26
Total*	**33.51**	**90.90**

Source: Appendix J.
Note: * Totals may not sum precisely due to rounding.

This restoration planning effort also factored in the potential for a 4.68- to 24-inch sea-level rise by 2050 (State of California 2013). For the purpose of complete disclosure, a summary of the habitat configuration and vegetation communities that would be expected based on anticipated 24-inch sea-level rise in 2050 is provided in Table 4.3-2. Regardless of sea-level rise, there would be no decrease in the acreage of the restored wetlands at either site. Figures 2-6a through 2-6d (see Chapter 2, Alternatives) illustrate the proposed restoration based on 2020 and 2050 sea level at the Otay River Floodplain Site and Pond 15 Site.

Table 4.3-2
Proposed Restoration Vegetation Communities for Alternative B – 2050

Restoration Area	Otay River Floodplain Site (acres)	Pond 15 Site (acres)
Subtidal	0.00	14.20
Mudflat – frequently flooded	14.01	27.56
Mudflat – frequently exposed	2.59	4.33

Table 4.3-2
Proposed Restoration Vegetation Communities for Alternative B – 2050

Restoration Area	Otay River Floodplain Site (acres)	Pond 15 Site (acres)
Low salt marsh	9.81	32.45
Mid salt marsh	3.51	7.54
High salt marsh	0.25	2.25
*Total Created Wetland Habitat**	*30.17*	*88.32*
Upland habitat	3.34	2.58
Total*	**33.51**	**90.90**

Source: Appendix J.
Note: * Totals may not sum precisely due to rounding.

Direct Impacts

Habitat and Vegetation Communities

Otay River Floodplain Site

Currently, native vegetation communities are limited to small patches of vegetation that have persisted on the 33.51-acre Otay River Floodplain Site. Areas of *Isocoma* scrub and southern coastal salt marsh compose approximately 39% (13.23 acres) of the site. The combination of non-native and native vegetation provides habitat for various species of wildlife for foraging, with limited areas suitable for nesting due to the disturbed and open nature of much of the site.

Excavating and dewatering activities associated with preparing the site for coastal wetland restoration in accordance with Alternative B would result in the direct conversion of 29.61 acres of existing upland and wetland habitat and disturbed non-native and native vegetation within the Otay River Floodplain Site to wetland communities. Included would be the conversion of 12.30 acres of native vegetation (i.e., *Isocoma* scrub and southern coastal salt marsh) to wetlands. Table 4.3-3 provides a summary of the impacts to existing vegetation communities and land cover types at the Otay River Floodplain Site (see Figure 4.3-1, Otay River Floodplain Restoration Site and Project Features Vegetation Impacts). The entire 33.51-acre Otay River Floodplain Site would be permanently impacted for the conversion to native habitats, predominantly wetlands.

Table 4.3-3
Summary of Impacts to Vegetation Communities and Land Cover Types at the Otay River Floodplain Site for Alternative B

Vegetation Community/Land Cover Type	Impact for Restoration to Upland Habitat (acres)	Impact for Restoration to Wetlands (acres)	Total Impact (acres)
Brackishwater	—	0.77	0.77
Disturbed habitat	1.70	6.98	8.68
Former salt pond bottom and borrow area	1.27	9.56	10.83
Isocoma scrub	0.93	11.04	11.97
Southern coastal salt marsh	—	1.26	1.26
Total*	**3.90**	**29.61**	**33.51**

Source: Appendix J.
Note: * Totals may not sum precisely due to rounding.

Although implementation of Alternative B would result in the conversion of existing habitat on the site, the impacted area would ultimately support intertidal wetland vegetation and native upland vegetation, restoring historical wetland habitat values to the entire Otay River Floodplain Site (Tables 4.3-1 and 4.3-2). The restoration would include approximately 25 acres of salt marsh creation, with the balance of the wetlands composed of subtidal or mudflat.

Restoration in the Otay River Floodplain Site would be limited to the portion of the floodplain located west of Nestor Creek. Within this portion of the Otay River Floodplain Site, the ground would be lowered to elevations suitable to support the target wetland habitats and wetland-associated upland habitats. The Otay River Floodplain Site would be planted with a mix of native wetland vegetation that would mature into low, mid, and high marsh vegetation communities (Appendix C).

The following objectives represent the factors that would contribute to the overall value of the wetland, which are also summarized in the Final Restoration Plan (FRP) (Appendix C). The restoration is anticipated to do the following:

- Provide maximum overall ecosystem benefits, including providing an upland buffer, enhancing downstream fish values, increasing regionally scarce habitat, and improving the local ecosystem diversity. The proposed restoration of the Otay River Floodplain Site would entail the conversion of a former solar evaporation pond to intertidal salt marsh, mudflat, and subtidal habitats. Intertidal salt marsh, intertidal mudflat, and subtidal habitats are regionally scarce habitats targeted for restoration/creation in the Southern California Bight. The proposed restoration has been designed to preserve and enhance biological diversity.

- Provide substantial fish habitat compatible with other wetland values at the site. The conversion of the former evaporation pond to intertidal salt marsh, mudflat, and subtidal habitat would provide substantial fish habitat where none exists today.
- Provide a buffer zone of an average of 300 feet wide, and not less than 100 feet wide, as measured from the upland habitat edge. The Otay River Floodplain Site is located in an isolated corner of south San Diego Bay, with buffers on all sides. The nearest human habitation is 100 feet from the entrance channel to the floodplain restoration; generally, the distance from human habitation is greater than 700 feet. The existing pedestrian trail is from 75 to 125 feet from the restoration site, but would be separated by a flood control levee along the Otay River.
- Provide maximum upland habitat areas (in addition to buffer zones). A gradual transition to upland habitat would be provided to allow for sea-level rise. This zone would provide a substantial area of wetland habitat around the perimeter of the Otay River Floodplain Site.
- Keep adverse impacts to existing functioning wetlands and other sensitive habitats to a minimum. The proposed restoration would entail conversion of a former salt evaporation pond to intertidal salt marsh, mudflats, and subtidal habitats. The former salt evaporation pond does not contain highly functioning wetlands or other sensitive habitats due to human alteration. Thus, the proposed action would have minimal adverse impacts to existing wetlands and other sensitive habitats.
- Provide site selection and a restoration plan to reflect the consideration of site-specific and regional wetland restoration goals.
- Produce and support wetland-dependent resources. The major goals of the proposed restoration are to protect, manage, enhance, and restore open water, coastal wetlands, and native upland to benefit native fish, wildlife, and plant species supported within the San Diego Bay NWR and to provide habitat for salt-marsh-dependent species.
- Increase the aggregate acreage of wetland in the Southern California Bight. The proposed restoration of the Otay River Floodplain Site would increase the aggregate acreage of tidal wetland.
- Require minimal maintenance. The proposed restoration of the former solar evaporation pond would be accomplished by creating elevations suitable for tidal wetland habitat. Once vegetation has become established, there is no anticipated need for additional planting or for maintenance of exotic weed species.

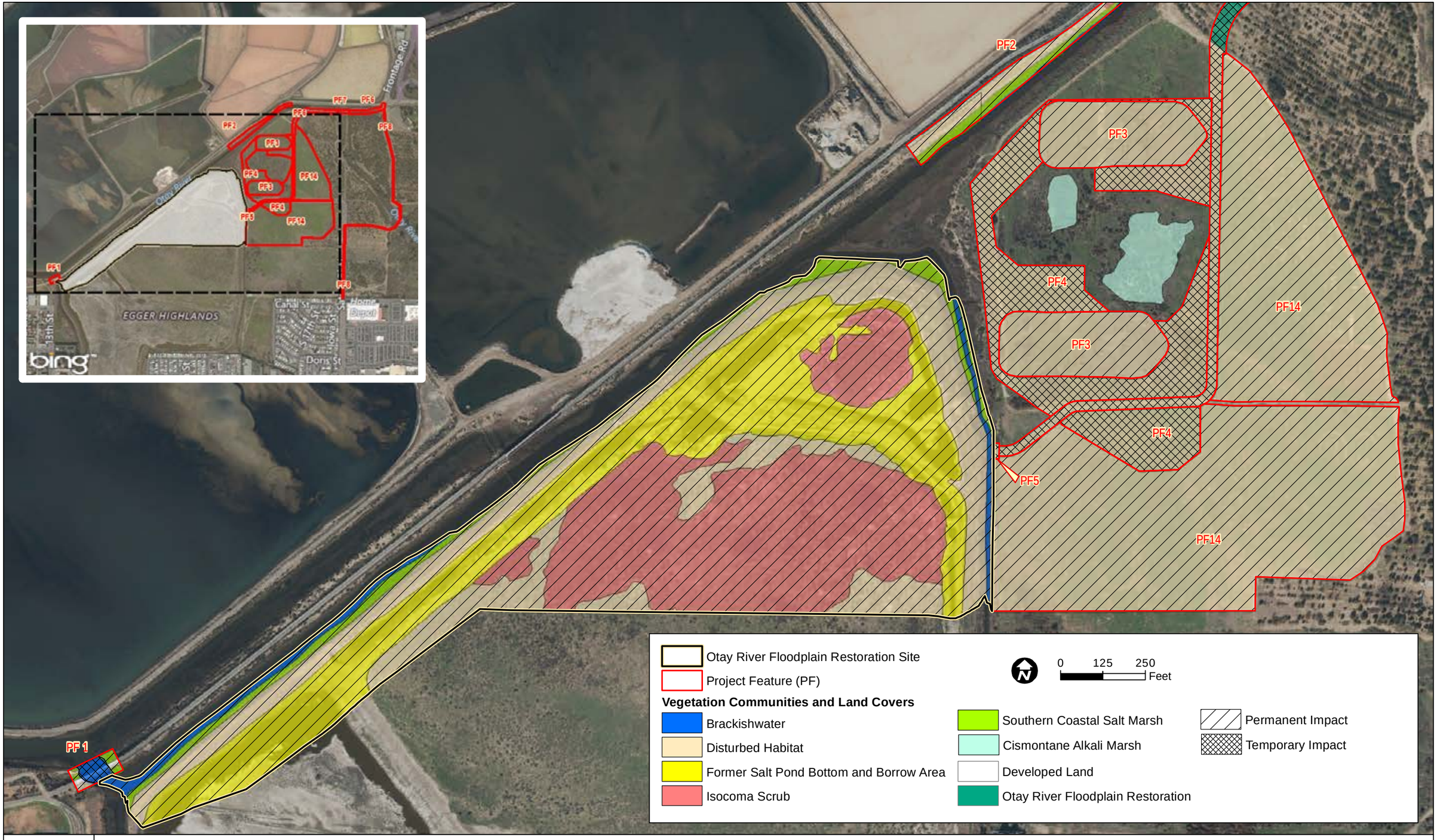

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FIGURE 4.3-1

Otay River Floodplain Restoration Site and Project Features Vegetation Impacts

Otay River Estuary Restoration Project (ORERP)

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The foraging function of the upland and disturbed vegetation communities would continue to be provided in the areas designated for upper salt marsh habitat and upland habitat. The impacts of conversion of the existing habitat values on the site would be beneficial by restoring coastal wetland habitat to the Otay River Floodplain Site. As a result, the conversion of the *Isocoma* scrub uplands to tidal wetlands is considered adverse but less than significant in terms of upland habitat loss and would be beneficial overall, in that more-productive and generally scarcer salt marsh habitat would be created in its place. Although some areas of southern coastal salt marsh (1.26 acres) would be temporarily impacted, the restoration would result in a substantial increase in tidal and overall wetland acreage, including low, mid, and high salt marsh habitat, for a total of 29.61 acres of wetland vegetation. Therefore, there would be a significant beneficial impact due to the restoration of the Otay River Floodplain Site.

Pond 15 Site

Implementation of Alternative B would involve converting open water habitat within an existing solar salt pond to subtidal, intertidal mudflat, and coastal salt marsh habitat by modifying the elevations and contours at the Pond 15 Site. A total of 1.30 acres of land under the jurisdiction of the San Diego Unified Port District (Port) would be impacted as discussed in this section.

Similar to the Otay River Floodplain Site, very limited native habitat and vegetation communities are present on the Pond 15 Site, which currently includes open water habitat associated with a solar salt evaporation pond. Small patches of southern coastal salt marsh and disturbed southern coastal salt marsh compose only 1% (0.97 acres) of the site.

The proposed restoration activities at the Pond 15 Site would result in direct impacts to 90.90 acres of the Pond 15 Site. Construction dewatering, grading, and filling would result in a permanent loss of 82.33 acres of open water habitat in the pond portion of the site, and 0.97 acres of native/natural vegetation communities/land covers along the salt pond levees consisting of coastal salt marsh. As a result of the proposed grading, the site would ultimately support native coastal wetland habitat (i.e., subtidal and intertidal wetlands) and native vegetation (i.e., coastal salt marsh). Table 4.3-4 provides a summary of the impacts to existing vegetation communities and land cover types at the Pond 15 Site (see Figure 4.3-2, Pond 15 Restoration Site and Project Features Vegetation Impacts).

Table 4.3-4
Summary of Impacts to Vegetation Communities and Land Cover Types at the Pond 15 Site for Alternative B

Vegetation Community/ Land Cover Type	Impact for Restoration to Upland Habitat (acres)	Impact for Restoration to Wetlands San Diego Bay NWR (acres)	Impact for Restoration to Wetlands Port Lands (acres)	Total Impact Area (acres)
Bay	—	—	1.15	1.15
Beach	—	0.01	—	0.01
Disturbed habitat	2.48	0.29	—	2.77
Open water	1.57	80.76	—	82.33
Salt pond levee	1.65	2.02	—	3.67
Southern coastal salt marsh	0.51	0.21	0.15	0.87
Disturbed southern coastal salt marsh	0.04	0.06	—	0.10
Total	**6.25**	**83.35**	**1.30**	**90.90**

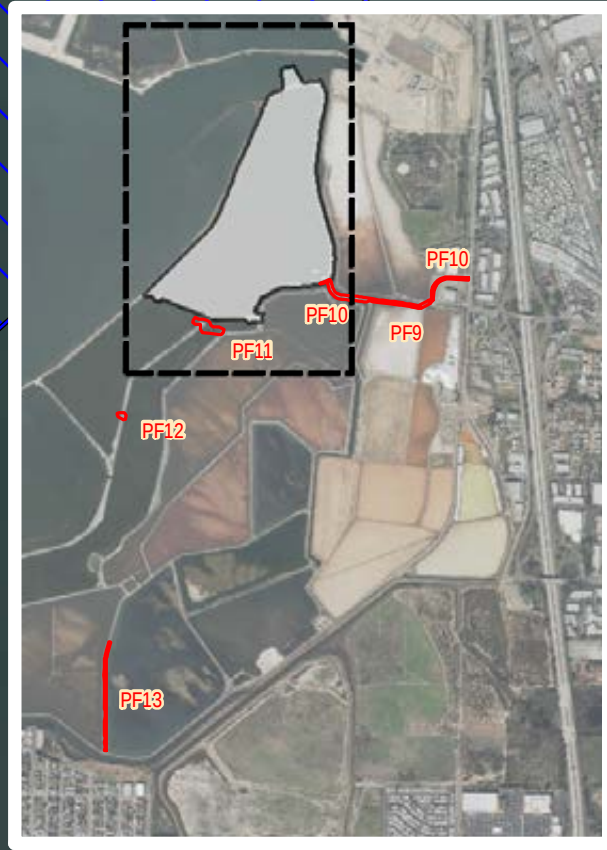
Source: Appendix J.

Implementation of Alternative B would result in the modification of existing habitat and native vegetation communities for restoring the historical tidal wetland habitat value in this area to support native plants, fish, and wildlife. Adequate acreage of native habitats would be restored (84.65 acres of wetlands) within the Pond 15 Site to offset the loss of open water and southern coastal salt marsh habitat.

Pond 15 Restoration Site
Project Feature (PF)
San Diego Unified Port District Jurisdiction
Permanent Impact
Temporary Impact

Vegetation Communities and Land Covers

Bay
Beach
Disturbed Habitat
Disturbed Southern Coastal Salt Marsh
Open Water
Salt Pond Levee
Southern Coastal Salt Marsh



Pond 15
Restoration Site

PF10

PF11

0 150 300 Feet

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FIGURE 4.3-2

Pond 15 Restoration Site and Project Features Vegetation Impacts

Otay River Estuary Restoration Project EIS

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The following objectives represent the factors that would contribute to the overall value of the wetland, which are also summarized in the FRP (Appendix C). The restoration is anticipated to do the following:

- Provide maximum overall ecosystem benefits, including providing an upland buffer, enhancing downstream fish values, increasing regionally scarce habitat, and improving the local ecosystem diversity. The proposed restoration of the Otay River Floodplain Site would entail the conversion of a former solar evaporation pond to intertidal salt marsh, mudflat, and subtidal habitats. Intertidal salt marsh, intertidal mudflat, and subtidal habitats are regionally scarce habitats targeted for restoration/creation in the Southern California Bight. The proposed restoration has been designed to preserve and enhance biological diversity.
- Provide substantial fish habitat compatible with other wetland values at the site. The conversion of the former evaporation pond to intertidal salt marsh, mudflat, and subtidal habitat would provide substantial fish habitat where none exists today.
- Provide a buffer zone of an average of 300 feet wide, and not less than 100 feet wide, as measured from the upland habitat edge.
- Keep adverse impacts to existing functioning wetlands and other sensitive habitats to a minimum. The proposed restoration would entail conversion of a former salt evaporation pond to intertidal salt marsh, mudflats, and subtidal habitats. The former salt evaporation pond does not contain highly functioning wetlands or other sensitive habitats due to human alteration. Thus, the proposed action would have minimal adverse impacts to existing wetlands and other sensitive habitats.
- Provide site selection and a restoration plan to reflect the consideration of site-specific and regional wetland restoration goals.
- Produce and support wetland-dependent resources. The major goals of the proposed restoration are to protect, manage, enhance, and restore open water, coastal wetlands, and native upland to benefit native fish, wildlife, and plant species supported within the San Diego Bay NWR and to provide habitat for salt-marsh-dependent species.
- Increase the aggregate acreage of wetland in the Southern California Bight.
- Require minimal maintenance. The proposed restoration of the former solar evaporation pond would be accomplished by creating elevations suitable for tidal wetland habitat. Once vegetation has become established, there is no anticipated need for additional planting or for maintenance of exotic weed species.

The impacts of converting the existing habitat values on the site would be beneficial by providing restoration of coastal wetland habitat within the Pond 15 Site. The conversion of open

water to tidal wetlands is considered adverse but less than significant in terms of habitat loss, and is beneficial overall in that more-productive and generally scarcer salt marsh habitat would be created in its place. Although some areas of southern coastal salt marsh (0.97 acres) would be temporarily impacted, the restoration would result in a substantial increase in tidal and overall wetland acreage, including low, mid, and high salt marsh habitat, for a total of 84.65 acres of wetland vegetation. Therefore, there would be a significant beneficial impact due to the restoration of the Pond 15 Site.

San Diego Unified Port District Lands

A total of 1.30 acres of Port lands are included in the Pond 15 Site and will be graded to create the opening of the pond, allowing it to become tidal wetlands. A total of 1.15 acres of bay and 0.15 acres of southern coastal salt marsh will be affected (Table 4.3-4 and Figure 4.3-2). The area currently designated as bay will remain as such but will be of greater depth to allow tidal flow between the bay and Pond 15. The area mapped as southern coastal salt marsh will be converted to bay at this location; however, a total of 55.83 acres of low, mid, and high salt marsh would be created in 2020. This habitat is to be established within the San Diego Bay NWR and is illustrated in the FRP. Thus, the impact to the southern coastal salt marsh vegetation community is fully addressed by the FRP.

Project Features

As presented in Chapter 2, the proposed restoration activities focus on the Otay River Floodplain Site and Pond 15 Site. However, several additional project features are required to facilitate the proposed action's restoration activities, including the following (discussed and described in detail in Chapter 2):

1. **Otay Channel Protection under Bikeway Bridge.** The channel protection would be a permanent impact except for the impacts to brackishwater which are temporary.
2. **Otay Channel Protection.** The channel protection would be a permanent impact.
3. **Stockpiles.** Within the proposed staging area, two areas encompassing a total of 4.07 acres would be permanently set aside for stockpiling excavated material.
4. **Staging Area.** Implementation of the proposed action would require a site where the logistics of mobilization and demobilization can temporarily occur, as well as where other activities related to the proposed action can be coordinated.
5. **Crossing at Nestor Creek.** To access the western portion of the Otay River Floodplain Site from the staging area east of Nestor Creek, the contractor would install a temporary crossing across Nestor Creek composed of fill material and associated culverts.

6. **Truck Route Connecting Nestor Creek.** The temporary truck construction access route would be used under any one of the three construction material transfer alternatives.
7. **Crossing at Otay River.** To access the construction staging area and western portion of the Otay River Floodplain Site from the end of Main Street, the contractor would install a temporary crossing at the Otay River channel.
8. **Bike Path Reroute.** An existing bike path that extends north/south between Saturn Boulevard to the south and Main Street to the north would be temporarily rerouted during construction to minimize conflicts between bicyclists and construction vehicles and to ensure user safety.
9. **Crossing at Palomar Channel.** The temporary crossing would be composed of fill material and associated culverts to ensure that the temporary crossing would not create impediments to water flow.
10. **Truck Crossing at Salt Pond Levee.** This would be a temporary impact.
11. **Pond 13 and Pond 14 Levee Modifications.** Permanent modifications in the northern areas of these ponds except for areas that will remain within open water; these will be temporary.
12. **Pond 13 and Pond 14 Levee Modifications.** Permanent modifications in the southern areas of these ponds except for areas that will remain within open water; these will be temporary.
13. **Raised Levee between Pond 22 and Pond 23.** The elevation of the levee that extends for approximately 14,000 feet between Ponds 22 and 23 would be permanently raised by 2 feet to a new crest elevation of +13 feet NAVD 88.
14. **Revegetation Area East of Nestor Creek.** The 21.5-acre area east of Nestor Creek would be permanently revegetated to native vegetation following completion of the proposed action. Stockpiled material on the staging area would partially be used for this revegetation effort.

Similar to the Otay River Floodplain Site and Pond 15 Site, most of the project features would occur on disturbed sites with limited habitat quality, as described in Table 4.3-5 and shown on Figures 4.3-1, 4.3-2, 4.3-3 (Project Features Vegetation Impacts – Otay River Floodplain Restoration Site), and 4.3-4 (Project Features Vegetation Impacts – Pond 15 Restoration Site). Small patches of *Isocoma* scrub occur in the vicinity of the Otay channel protection (Project Feature (PF) 2). Small patches of mule fat scrub occur in the vicinity of the truck route (PF 6). Small patches of southern coastal salt marsh are impacted by the Otay channel protection under the bikeway bridge (PF 1), Otay channel protection (PF 2), two-lane truck route (PF 6), crossing at Otay River (PF 7), crossing at Palomar channel (PF 9), and two-lane truck crossing (PF 10). Freshwater marsh occurs in the vicinity of the temporary crossing of Otay River (PF 7).

Implementation of the project features in support of the overall habitat restoration activities at the Otay River Floodplain Site and Pond 15 Site would result in direct temporary and permanent construction-related impacts to approximately 40.8 acres of vegetation communities and land covers, with a 21.50-acre restoration effort of the staging area upon completion of the proposed action. Table 4.3-5 provides a summary of the impacts to existing vegetation communities and land cover types associated with the project features.

Implementing the project features associated with restoration under Alternative B would result in both permanent and temporary modifications of existing native vegetation communities to increase the overall value of habitat associated with coastal wetland restoration. Although these impacts are part of the beneficial impact of the restoration, the impacts to native habitats are potentially significant; therefore, Mitigation Measure (MM) BIO-1 is provided (see Mitigation Measures in this section). MM-BIO-1 would require the restoration of any temporary project features to pre-construction conditions and require impacted areas to be planted with appropriate native plant species once construction is complete, per the Construction Methods as described in Section 2.3.2.4 and Section 2.4, Alternatives Considered but Eliminated from the Detailed Analysis. MM-BIO-3 would require the restoration of any permanent project features per the FRP.

Table 4.3-5
Summary of Impacts to Vegetation Communities and Land Covers Resulting from Project Features for Alternative B

Vegetation Community/ Land Cover Type	Project Features (acres)														
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*Total*
Brackishwater	0.13	0.08							0.01						0.21
Developed land	0.02					0.12	0.01	0.74	0.04	0.49					1.42
Disturbed habitat	0.03	0.68	4.07	6.06	0.02	1.87	0.07	0.02	0.04	0.30	0.02	0.02	0.41	21.50	35.11
Salt flat										0.06					0.06
Open water										0.40	0.79	0.08	0.03		1.30
Salt pond levee									0.01	0.45	0.19	0.08	0.31		1.04
Otay river floodplain restoration						0.56		0.03							0.59
Freshwater marsh							0.08								0.08
Isocoma scrub		0.06													0.06
Mulefat scrub						0.06									0.06
Southern coastal salt marsh	0.06	0.47				0.02	0.02		0.06	0.19					0.82
Total	**0.24**	**1.29**	**4.07**	**6.06**	**0.02**	**2.63**	**0.18**	**0.79**	**0.16**	**1.89**	**1.00**	**0.18**	**0.75**	**21.50**	**40.76**

1 Otay Channel Protection under Bikeway Bridge (temporary and permanent)
2 Otay Channel Protection (permanent)
3 Stockpiles (permanent)
4 Staging Area (temporary)
5 Crossing at Nestor Creek (temporary)
6 Two-Lane Truck Route Connecting Nestor Creek (temporary)
7 Crossing at Otay River (temporary)
8 Bike Path Reroute (temporary)
9 Crossing at Palomar Channel (temporary)
10 Two-Lane Truck Crossing at Salt Pond Levee (temporary)
11 Levee Modification of Ponds 13 and 14 – North (temporary and permanent)
12 Levee Modification of Ponds 13 and 14 – South (temporary and permanent)
13 Raised Levee between Ponds 22 and 23 (permanent)
14 Revegetation Area East of Nestor Creek (permanent)

Jurisdictional Waters

Otay River Floodplain Site

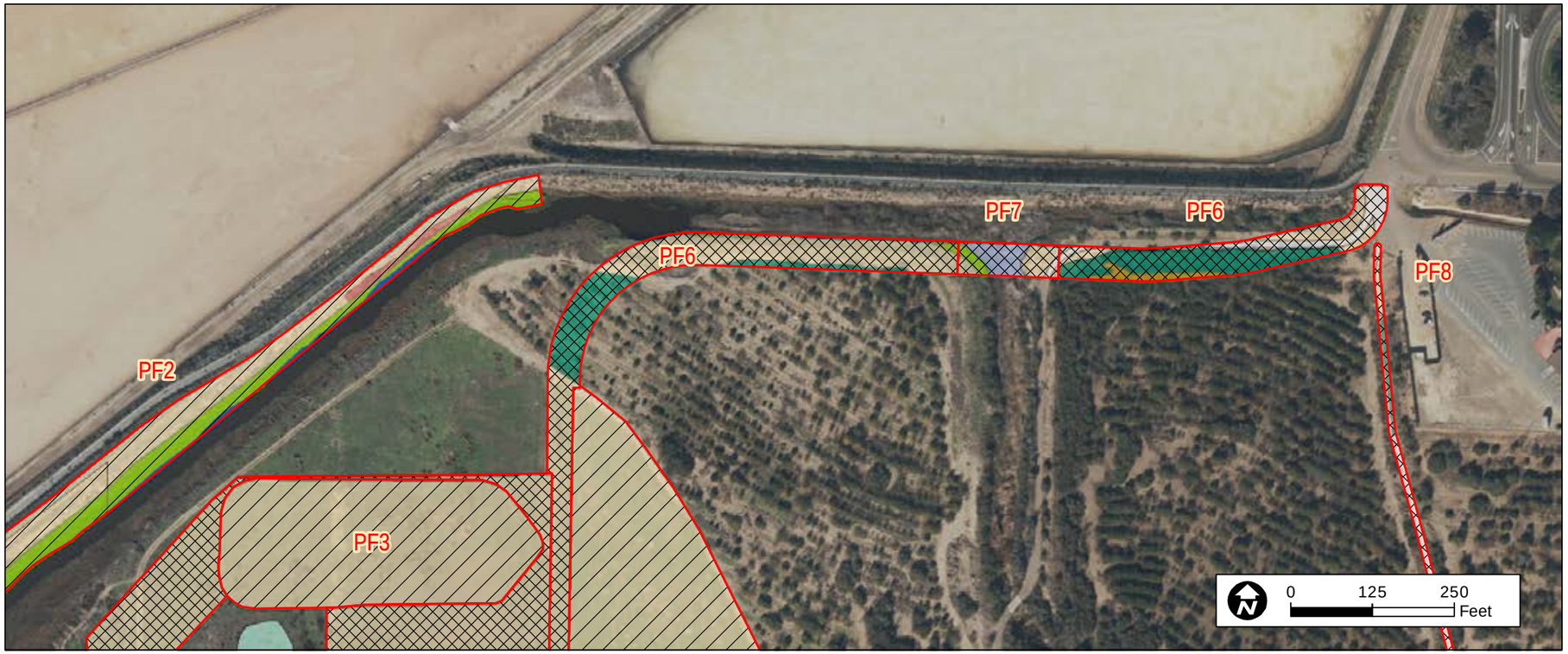
The restoration activities at the Otay River Floodplain Site, as proposed under Alternative B, would result in direct impacts to jurisdictional waters. Approximately 6.43 acres of Corps, Regional Board, and Commission jurisdictional wetlands are present within the 33.51-acre Otay River Floodplain Site. All of these wetlands would be impacted during grading.

Restoration would result in 29.61 acres of jurisdictional wetlands (mudflat, low salt marsh, mid salt marsh, and high salt marsh), including 23.84 acres of wetlands created within current upland areas and 5.77 acres of high-quality salt marsh wetland habitat created by recontouring and regrading existing wetlands. This gain in wetland acreage, combined with the expected increased wetland functions that a restored tidal system would provide, represents a beneficial impact. Analysis of the wetland functions is described following Table 4.3.6. Table 4.3-6 provides a summary of the impacts to jurisdictional wetlands and waters at the Otay River Floodplain Site.

Table 4.3-6
Summary of Impacts to Jurisdictional Waters
at the Otay River Floodplain Site for Alternative B

Vegetation Community	Corps, Regional Board, Commission Jurisdiction		
	Impact for Restoration to Upland Habitat (acres)	*Impact for Restoration to Wetlands (acres)*	*Total Impact Area (acres)*
Non-Wetlands			
Brackishwater	—	0.77	0.77
Former salt pond bottom and borrow area	0.66	2.86	3.52
Wetlands			
Southern coastal salt marsh	—	1.26	1.26
Former salt pond bottom and borrow area	—	0.87	0.87
Total*	**0.66**	**5.77**	**6.43**

Source: Appendix J.
Note: * Totals may not sum precisely due to rounding.



- Otay River Floodplain Restoration Site
- Project Feature (PF)

Vegetation Communities and Land Covers

- Brackishwater
- Disturbed Habitat
- Former Salt Pond Bottom and Borrow Area
- Isocoma Scrub
- Permanent Impact
- Temporary Impact
- Southern Coastal Salt Marsh
- Cismontane Alkali Marsh
- Developed Land
- Otay River Floodplain Restoration

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FIGURE 4.3-3

Project Features Vegetation Impacts

Otay River Estuary Restoration Project (ORERP)

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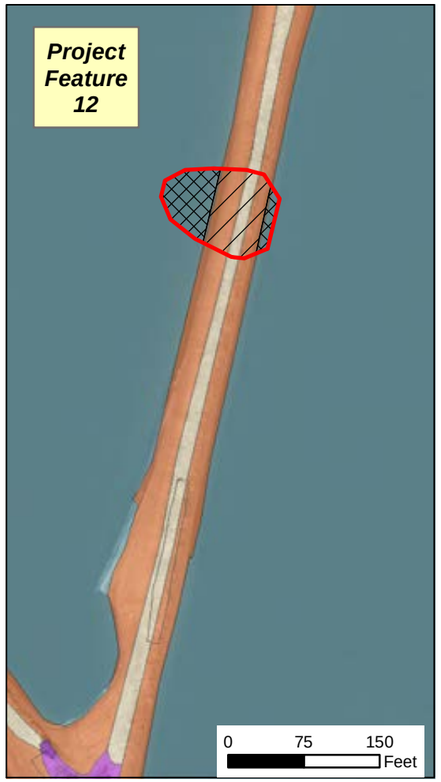

Pond 15 Restoration Site
Project Feature (PF)
Permanent Impact
Temporary Impact

Vegetation Communities and Land Covers

Bay
Beach
Brackishwater
Disturbed Southern Coastal Salt Marsh
Open Water
Salt Flats
Disturbed Habitat
Developed Land
Salt Pond Levee
Southern Coastal Salt Marsh

AERIAL SOURCE: SANDAG IMAGERY 2014

FIGURE 4.3-4

Project Features Vegetation Impacts

Otay River Estuary Restoration Project EIS

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In support of the conclusion on the benefits of the restoration, a California Rapid Assessment Method (CRAM) Report was prepared by Dudek in 2016 (Appendix J). The CRAM Report presents the results of an assessment of the baseline ecological conditions and the predicted post-action conditions of the wetland resources as a result of the restoration. CRAM was developed as a rapid, scientifically defensible, and repeatable assessment methodology that can be used to assess and monitor the condition of wetlands and riparian habitats. The assessment method is a diagnostic tool that can be used to assess the condition of a wetland or riparian site using visual indicators in the field. Visual indicators are used to choose the best-fit description of habitat condition for a variety of metrics and submetrics within four universal attributes: Buffer and Landscape Context, Hydrology, Physical Structure, and Biotic Structure. The purpose of predicting post-project functions and services is to determine the ecological condition of representative jurisdictional areas within the project site relative to the conditions that are expected after the proposed action is completed.

The Otay River Floodplain Site was analyzed for a suite of variables that pertain to common attributes that estuarine systems are expected to have. Per the analysis of the Buffer and Landscape Context attribute, although the site has a buffer, the aquatic area abundance, buffer width, and buffer condition are diminished due to surrounding land use associated with the Bayshore Bikeway, unnatural berms surrounding Pond 20, and historical agricultural uses nearby. The Hydrology attribute scored low due to a combination of urban runoff and groundwater (elevated water table), rather than tidal inundation. The Physical Structure attribute scored low due to a general lack of structural diversity and low topographic complexity as a consequence of the constructed salt pond setting. Per the analysis of the Biotic Structure attribute, the area is primarily unvegetated, and where there is vegetation, it is dominated by non-native species. The vegetation has little biotic structural diversity and very low horizontal interspersion, which is reflected in the low scores for this attribute. In comparison, the post-construction CRAM scores are anticipated to be higher due to the tidal connectivity and the associated cycles of minima and maxima, the construction of complex topography, and the planting of native habitat with incorporation of tidal channels and mudflats. It is anticipated that the site will go from being primarily unvegetated, lacking any tidal flushing, to a functional tidal system with large areas vegetated with salt marsh habitat. The restored areas are expected to be populated by a large diversity and high abundance of fish, birds, and macroinvertebrates indicative of highly functioning intertidal marshes that eventually export productivity to the baywide system rather than acting as a sink (WRA 2013).

Results of the CRAM analysis indicate substantially improved functions and services of aquatic resources would result from the proposed restoration. Further, the pond and associated islands and shorelines are anticipated to provide much greater biologic functions and services (including functions and services specific to wildlife not measured by CRAM) for the target wildlife species compared to the current condition as described in the FRP

(Appendix C). The results of the CRAM analysis confirm that there will be a substantial improvement of functions and services of jurisdictional wetlands and waters from implementation of the proposed action, given adherence to the primary goal of the FRP (restoration of essential aquatic and salt marsh habitats).

Implementation of Alternative B would permanently impact 5.77 acres of wetland (Table 4.3-6), which would be replaced as described in this section by revegetation of high quality wetlands (see Figure 4.3-5, Otay River Floodplain Restoration Site and Project Features Jurisdictional Impacts). This would result in a potentially significant impact to jurisdictional wetlands; therefore, MM-BIO-2 is provided. MM-BIO-2 requires that the 5.77 acres of wetland that would be converted to other wetlands under Alternative B be mitigated at a minimum of a 1:1 ratio within the combined Otay River Floodplain Site and Pond 15 Site in accordance with the FRP (Appendix C). The impact to 0.66 acres of waters of the United States (former salt pond bottom and borrow area) that would be converted to upland habitat would be a significant impact to jurisdictional wetlands or waters; therefore, MM-BIO-3 is provided. MM-BIO-3 requires that impacts to the 0.66 acres of waters of the United States be mitigated at a 4:1 ratio in accordance with the FRP (Appendix C). Following implementation of MM-BIO-2 and MM-BIO-3, impacts would be reduced to less than significant.

Pond 15 Site

The proposed restoration activities at the Pond 15 Site would result in direct permanent impacts to jurisdictional waters associated with the solar salt pond. A total of 88.14 acres of Corps, Regional Board, and Commission jurisdictional wetlands have been delineated within the 90.90-acre Pond 15 Site.

Jurisdictional waters would be affected by filling within the salt pond and removing or otherwise manipulating the earthen salt pond levees. Alternative B would result in 84.37 acres of jurisdictional wetlands (mudflat, low salt marsh, mid salt marsh, and high salt marsh) by recontouring and regrading the 84.37 acres of existing wetlands and waters. This gain in wetland acreage, combined with the expected increased productivity of wetland functions that a restored tidal system would provide, would represent a beneficial impact. All of the 84.37 acres (83.95 acres of non-wetland waters and 0.42 acres of wetlands) would be converted to other wetlands under Alternative B. Impacts to the 84.37 acres of wetlands or waters are potentially significant; therefore, MM-BIO-2 is provided. MM-BIO-2 requires that mitigation be provided at a 1:1 ratio in accordance with the FRP (Appendix C). Impacts to the 3.77 acres of wetlands or waters of the United States that would be converted to upland habitat are potentially significant; therefore, MM-BIO-3 is provided. MM-BIO-3 requires that mitigation be at a 4:1 ratio in accordance with the FRP (Appendix C). The 84.37 acres of predominantly non-wetland waters would be converted to subtidal, intertidal, mudflat, and coastal salt marsh (Figure 4.3-6, Pond 15

Restoration Site and Project Features Jurisdictional Impacts). Table 4.3-7 provides a summary of the impacts to jurisdictional waters at the Pond 15 Site. This mitigation is accomplished as a combination of the Otay River Floodplain Site and Pond 15 Site. Following implementation of MM-BIO-2 and MM-BIO-3, impacts would be reduced to less than significant.

Table 4.3-7
Summary of Impacts to Jurisdictional Waters at the Pond 15 Site for Alternative B

Vegetation Community/ Land Covers	Corps, Regional Board, Commission Jurisdiction			
	Impact for Restoration to Upland Habitat (acres)	*Impact for Restoration to Wetlands – San Diego Bay NWR (acres)*	*Impact for Restoration to Wetlands – Port Lands (acres)*	*Total Impact Area (acres)*
Bay	—	—	1.15	1.15
Beach	—	0.01	—	0.01
Open water	1.57	80.76	—	82.33
Salt pond levee	1.65	2.02	—	3.67
Southern coastal salt marsh	0.51	0.21	0.15	0.87
Southern coastal salt marsh – disturbed	0.04	0.06	—	0.10
Total*	**3.77**	**83.07**	**1.30**	**88.14**

Source: Appendix J.
Note: * Totals may not sum precisely due to rounding.

The Pond 15 Site is an existing industrial solar salt production pond but does have some ecological function for migratory birds. As a result, the applicant undertook a "functional lift" assessment in consultation with the Science Advisory Panel appointed by the Commission. It was determined that for each acre restored to tidal habitat within the Pond 15 Site, 0.75 acres would be applied toward the MLMP requirements. The Pond 15 Site would be restored to tidal marsh using material excavated from the Otay River Floodplain Site and by breaching the levee to introduce tidal action. Currently, the salt evaporator ponds are non-tidal basins containing brines of varying levels of salinity and are used as part of the solar salt production system operated by the South Bay Salt Works. The South Bay Salt Works takes in saltwater from San Diego Bay (Bay), and through a process of sequential evaporation, produces crystalline salt at the plant site. The salt evaporator ponds do not support tidal wetland vegetation, and since salinities in the ponds quickly exceed those tolerable to marine life, the ponds do not support fish or invertebrates typical of or similar to those found in the Bay. The restoration of the Pond 15 Site to intertidal habitats would improve diversity and productivity and provide increased fish production to San Diego Bay.

In support of the conclusion on the benefits of the restoration, a CRAM Report was prepared (Appendix J), as described in more detail previously. Similar to the Otay River Floodplain Site, the Pond 15 Site was analyzed for a suite of variables that pertain to common attributes that

estuarine systems are expected to have. Dudek evaluated the site from the perspective of the functions and services expected or anticipated after the passage of several years (e.g., 5 years) following construction of the proposed action to allow for the establishment of vegetation on the Pond 15 Site following the large-scale disturbances resulting from construction. Extensive areas are currently barren or open water, lacking any vegetation at all; that condition is expected to change following construction.

The Pond 15 Site was analyzed for a suite of variables that pertain to common attributes for estuarine systems, similar to the analysis conducted for the Otay River Floodplain Site. The Buffer Width score was high due to the CRAM guidelines that allow for the extension of buffer measurements into open water in situations where there is a buffer between the site and the open water. The overall score for Buffer and Landscape Context was slightly diminished due to surrounding land use associated with the salt pond operations and periodic maintenance of the perimeter berms. The Hydrology attribute scored low due to the constructed berms surrounding the area, preventing a natural tidal connection. Hydrology at the site is due to manually operated tide gates that route water through the evaporative salt pond cycle, rather than to natural tidal inundation. There are no freshwater sources from upstream, and no natural tidal connection that affects the hydrology. The Physical Structure attribute scored low due to a general lack of structural patch types and low topographic complexity as a consequence of the constructed salt pond setting. The area is primarily unvegetated. There are a few small patches of vegetated land on the inside slope of the berm, dominated by non-native plant species. Biotic structural diversity and horizontal interspersion are very low, resulting in low scores on the Biotic Structure attribute.

In comparison, the post-construction CRAM scores are anticipated to be higher. The Pond 15 Site would continue to have a buffer that would extend well beyond the edge of the site. Incorporating tidal connectivity into design of the proposed action would improve the Hydroperiod and Hydrologic Connectivity metrics. The FRP indicates that the site would be constructed to experience a full tidal exchange (Appendix C). The Physical Structure attribute score would be substantially increased due to the incorporation of topographic complexity (swales and channels) into the restoration design. The area is expected to be primarily vegetated with native habitat in the post-construction condition, with intervening tidal channels and mudflats. The Biotic Structure score is expected to be substantially improved with the proposed restoration design, with an array of habitats corresponding to the elevational gradient from subtidal to upper salt marsh. Improved scores are expected considering that the Pond 15 Site would go from being a salt evaporator pond lacking any tidal flushing to a functioning tidal system with large areas vegetated with salt marsh habitat.

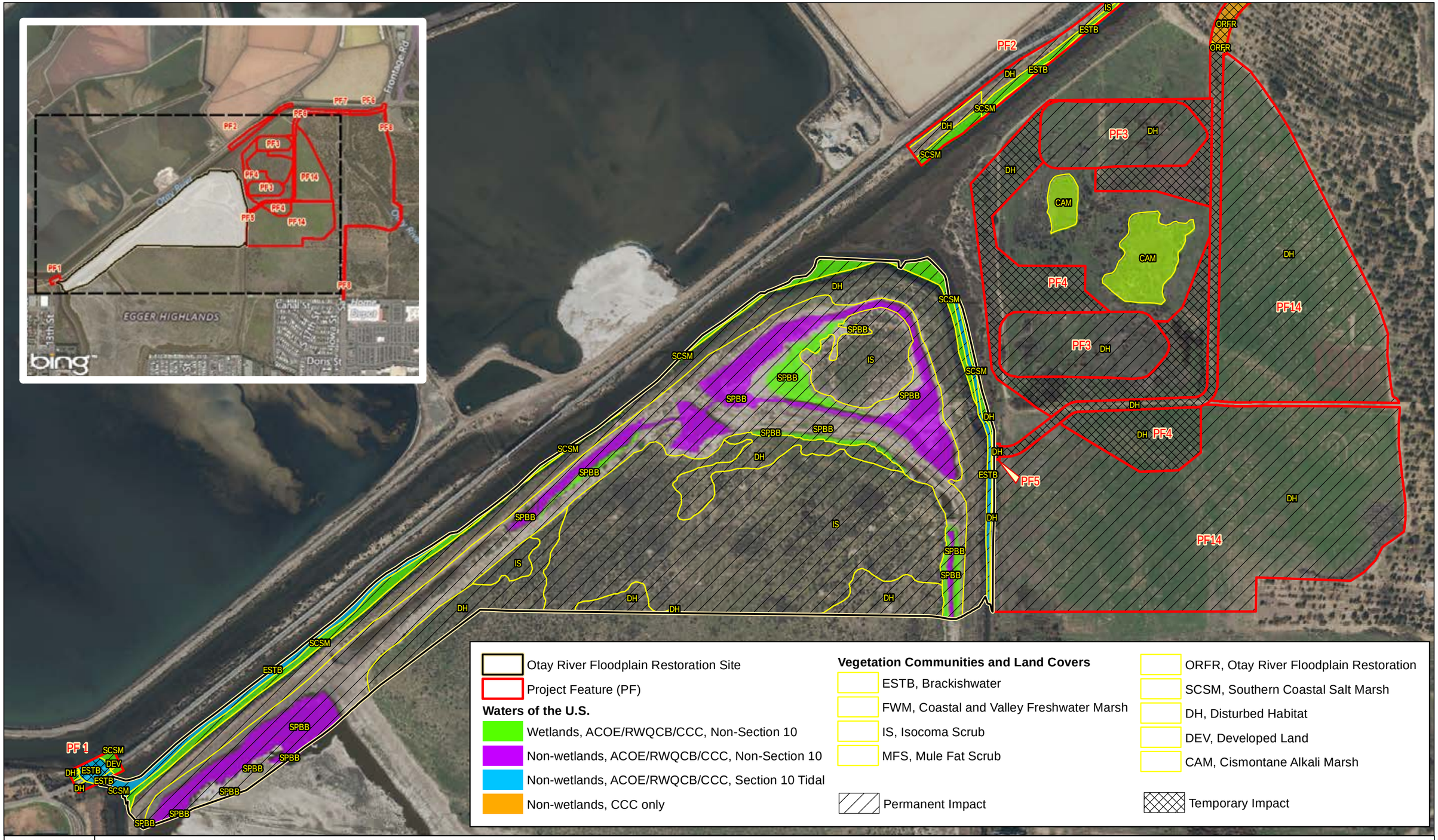

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FIGURE 4.3-5

Otay River Floodplain Restoration Site and Project Features Jurisdictional Delineation Impacts

Otay River Estuary Restoration Project (ORERP)

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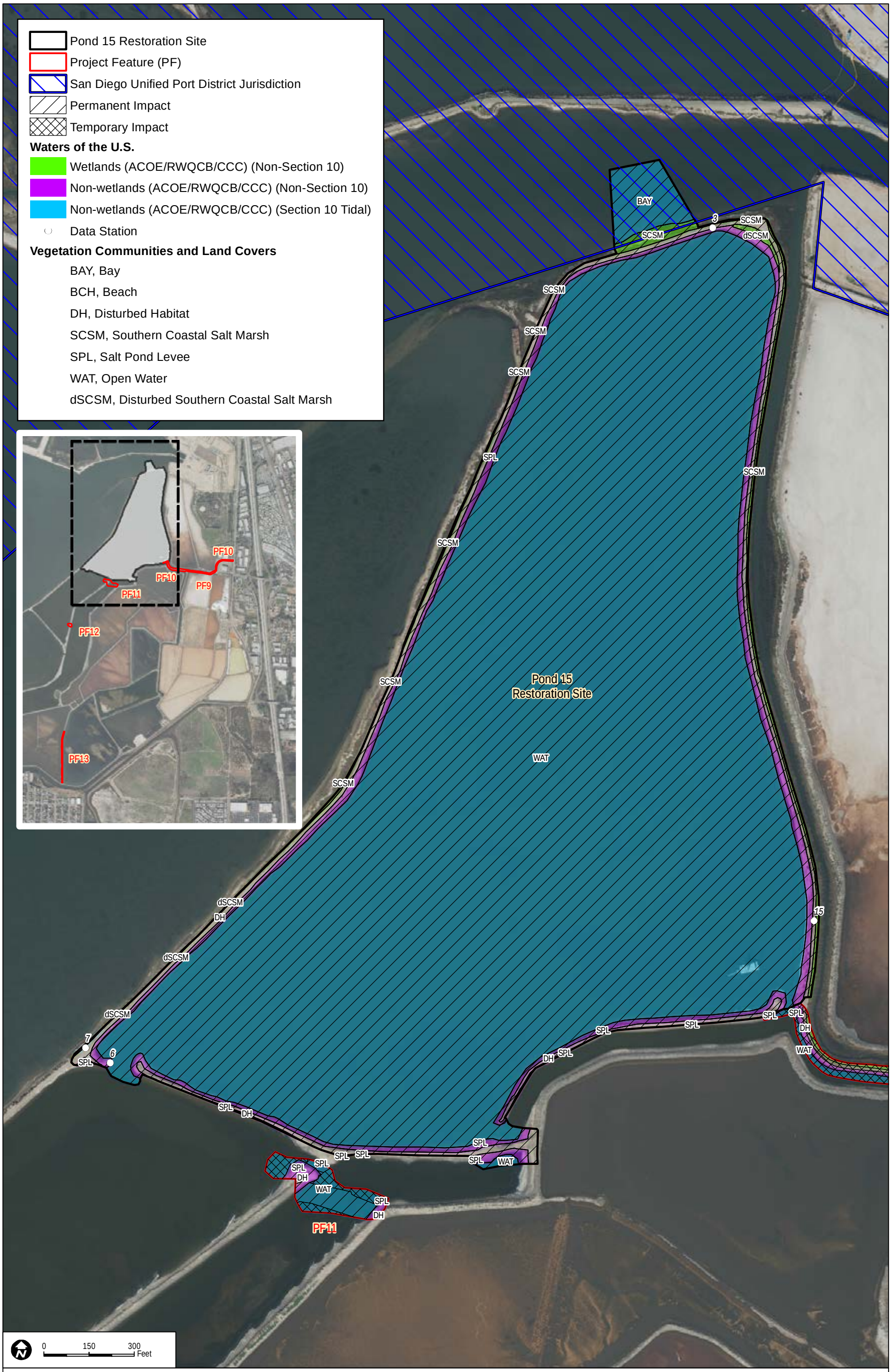

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FIGURE 3.3-6

Pond 15 Restoration Site and Project Features Jurisdictional Delineation Impacts

Otay River Estuary Restoration Project EIS

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The balance of functions and services related to wildlife are carefully evaluated in the Poseidon Mitigation Credit Analysis Marine Life Mitigation Plan – Integrated Restoration Plan (WRA 2013). The restored areas are expected to be populated by a large diversity and high abundance of fishes, birds, and macroinvertebrates indicative of highly functioning intertidal marshes that eventually export productivity to the baywide system rather than acting as a sink (WRA 2013).

Results of the analysis for the Pond 15 Site indicate that substantially improved functions and services of aquatic resources would result. Further, the ponds and associated islands and shorelines are anticipated to provide much greater biologic functions and services for the target wildlife species compared to the current condition or future condition absent the proposed action, as described in the FRP. The results of the CRAM analysis for the Pond 15 Site confirm that there would be a substantial improvement of the functions and services of wetlands and waters due to implementation of the proposed action.

San Diego Unified Port District Lands

A total of 1.30 acres of Port lands that are jurisdictional resources are included in the Pond 15 Site and will be graded to create the opening of the pond, allowing it to become tidal wetlands. A total of 1.15 acres of bay and 0.15 acres of southern coastal salt marsh wetlands will be affected (Table 4.3-4 and Figure 4.3-6). The area currently designated as bay will remain as such but will be of greater depth to allow tidal flow between the bay and Pond 15. The area mapped as southern coastal salt marsh will be converted to bay at this location; however, a total of 55.83 acres of low, mid, and high salt marsh would be created in 2020. This habitat is to be established within the San Diego Bay NWR as wetlands and is illustrated in the FRP. Thus, the impact to the southern coastal salt marsh and bay vegetation communities are fully addressed by the FRP.

Jurisdictional Impacts Summary

Total restoration within the Pond 15 Site and Otay River Floodplain Site would provide 114.26 acres of jurisdictional wetlands, including native habitat and coastal salt marsh vegetation. As noted in this section and within MM-BIO-2 and MM-BIO-3, a mitigation ratio of 4:1 would be provided for the 4.43 acres of wetlands that would be impacted and converted to upland habitat (0.66 acres for the Otay River Floodplain Site and 3.77 acres for the Pond 15 Site). A mitigation ratio of 1:1 is provided for the jurisdictional impacts of 90.14 acres of wetlands converted to tidal wetlands (5.77 acres for the Otay River Floodplain Site and 84.37 acres for the Pond 15 Site). The mitigation ratios have been deemed appropriate by the Corps because the restoration of coastal wetland habitat would represent a direct beneficial impact on vegetation communities at the Pond 15 Site. A summary of the impacts and proposed mitigation is provided in Table 4.3-8.

Table 4.3-8
Determination of Mitigation Acreage Requirement for Impacts to Jurisdictional Resources

Site	Impact	Mitigation Ratio	Required Mitigation Acreage
Otay River Floodplain Site	5.77 acres conversion of existing wetlands to tidal wetlands	1:1	5.77
Otay River Floodplain Site	0.66 acre conversion of existing wetlands to upland habitat	4:1	2.64
Pond 15 Site	84.37 acres conversion of existing wetlands to tidal wetlands	1:1	84.37
Pond 15 Site	3.77 acres conversion existing wetlands to upland habitat	4:1	15.08
Project Features	1.36 acres conversion of existing wetlands to tidal wetlands	1:1	1.36*
Project Features	0.98 acre conversion of existing wetlands to upland habitat	4:1	3.92
Project Features	0.62 acre of Commission-only wetland restored in place	1:1	0.62*
Total Required Mitigation Acreage			**111.78**
Total Mitigation Acreage Resulting from Restoration (Combined for Otay River Floodplain Site and Pond 15 Site)			**114.26**

*These acreages are not included in the total because the restoration will be at the location of impact immediately upon completion.

Project Features

Implementation of the project features associated with habitat restoration activities at the Otay River Floodplain Site and Pond 15 Site under Alternative B would result in direct temporary and permanent construction-related impacts to approximately 3.04 acres of jurisdictional waters.

Jurisdictional waters would be affected during construction activities associated with the Otay channel protection under Bikeway Bridge (PF 1), Otay channel protection (PF 2), two-lane truck route connecting Nestor Creek (PF 6), temporary crossing of Otay River (PF 7), crossing at Palomar channel (PF 9), two-lane truck crossing at salt pond levee (PF 10), levee modification of Ponds 13 and 14 – north and south (PF 11 and PF 12), and raised levee between Ponds 22 and 23 (PF 13). The channel protection features and levee modifications would be permanent impacts that will affect most of each of the project feature except for those areas that will remain within the brackishwater habitat. The river and channel crossings, although temporary in function, are also considered permanent impacts by the Corps. All jurisdictional impacts are to combined Corps, Regional Board, and Commission wetlands and waters except for the two-lane truck route connecting Nestor Creek, which would result in temporary impacts to Commission-only jurisdictional wetlands. The Corps, Regional Board, and Commission permanent jurisdictional impacts resulting from channel protection features, levee modifications, crossings, and truck routes would involve the conversion of 2.34 acres of wetlands, 0.98 acres of which would be permanently impacted and 1.36 acres of which would be restored to original condition upon completion of the proposed action. Commission-only jurisdictional impacts would be temporary and total 0.62 acres (Figures 4.3-5, 4.3-6, 4.3-7 (Project Features Jurisdictional Impacts – Otay River Floodplain Restoration Site), and 4.3-8 (Project Features Jurisdictional Impacts – Pond 15 Restoration Site)). Table 4.3-9 provides a summary of the impacts to jurisdictional waters associated with the project features and the summary of the project total impact is provided in Table 4.3-8.

Table 4.3-9
Summary of Impacts to Jurisdictional Waters Resulting from Project Features for Alternative B

Vegetation Community/ Land Cover Type	Project Features under Corps, Regional Board, and Commission Jurisdiction, Except Where Noted as Commission-Only*(acres)														
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*Total*
Brackishwater	0.13	0.08							0.01						**0.21**
Open water										0.40	0.79	0.08	0.03		**1.30**
Otay river floodplain restoration – Commission only						0.56									**0.56**
Freshwater marsh							0.08								**0.08**
Mulefat scrub – Commission only						0.06									**0.06**
Southern coastal salt marsh	0.06	0.47				0.02	0.02		0.06	0.19					**0.82**
Total**	**0.19**	**0.55**	**—**	**—**	**—**	**0.65**	**0.10**	**—**	**0.07**	**0.59**	**0.79**	**0.08**	**0.03**	**—**	**3.04**

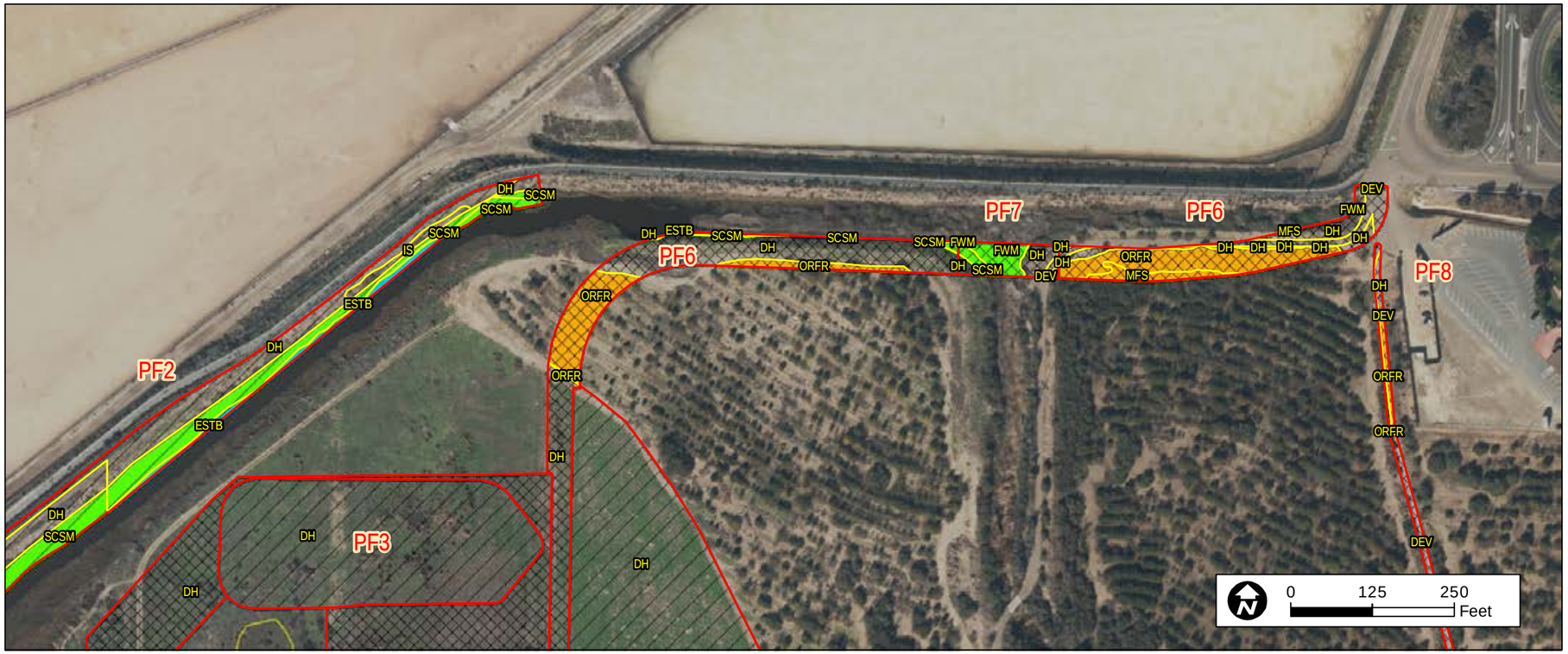
* Commission wetlands define wetland boundaries by a single parameter (i.e., hydric soils, hydrophytic vegetation, or hydrology).
** Totals may not sum precisely due to rounding.
1 Otay Channel Protection under Bikeway Bridge (temporary and permanent)
2 Otay Channel Protection (permanent)
3 Stockpiles (permanent)
4 Staging Area (temporary)
5 Crossing at Nestor Creek (temporary)
6 Two-Lane Truck Route Connecting Nestor Creek (temporary)
7 Crossing at Otay River (temporary)
8 Bike Path Reroute (temporary)
9 Crossing at Palomar Channel (temporary)
10 Two-Lane Truck Crossing at Salt Pond Levee (temporary)
11 Levee Modification of Ponds 13 and 14 – North (temporary and permanent)
12 Levee Modification of Ponds 13 and 14 – South (temporary and permanent)
13 Raised Levee between Ponds 22 and 23 (permanent)
14 Revegetation Area East of Nestor Creek (permanent)

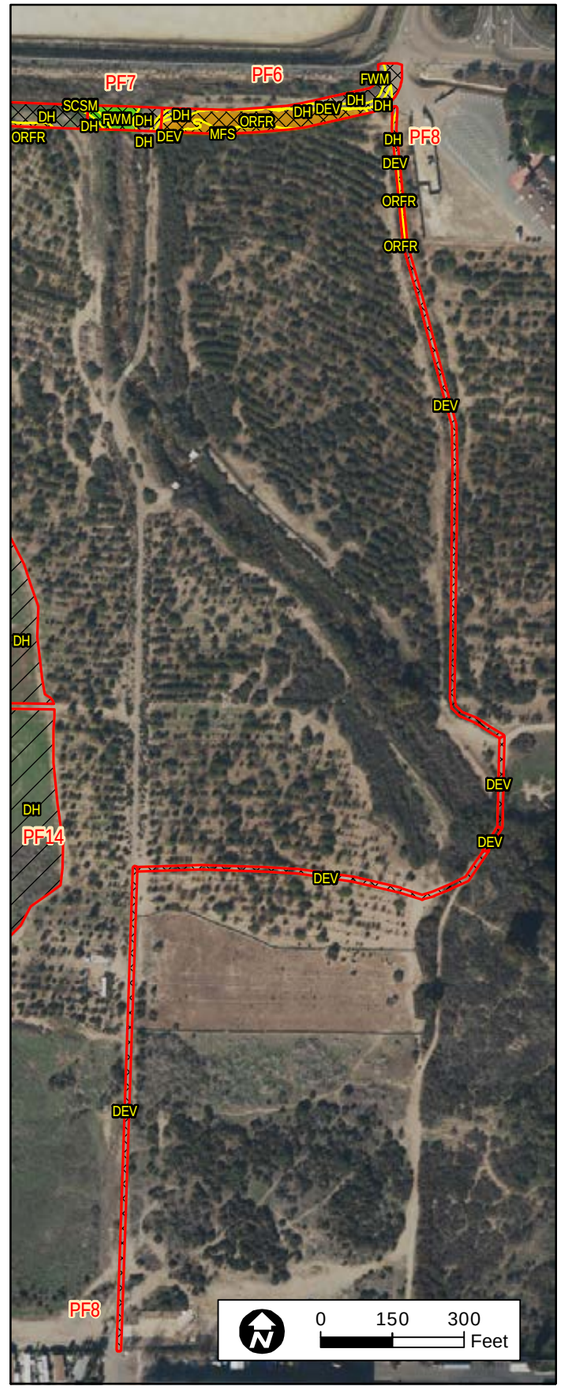
As summarized above for the project features, implementation of Alternative B would result in both temporary and permanent modifications to existing jurisdictional waters for restoring coastal wetlands. Although it is understood that all impacts to jurisdictional resources are considered permanent by the Corps and would be treated as such during permitting, most of the wetland impacts resulting from the project features would be restored upon completion of the proposed action. The temporary impacts to 1.36 acres of wetlands within the project features would be restored to original conditions. These 1.36 acres of impacts would be mitigated at a 1:1 ratio and would be restored in place to pre-project conditions (MM-BIO-1). The 0.98 acres of jurisdictional wetlands that would be converted to uplands as part of the project features would be mitigated at a 4:1 ratio and would be included in the overall restoration (MM-BIO-3). The restoration of 114.26 acres of coastal wetlands within the overall project site would more than offset the conversion of wetlands to uplands. The 0.62-acre impact to Commission-only wetlands would be restored in place to pre-construction conditions (MM-BIO-1).

Indirect Impacts

Otay River Floodplain Site

Implementation of Alternative B may result in a temporary and seasonal increase of fugitive dust that could disrupt plant vitality and decrease plant productivity. Construction activities, including dewatering, soil excavation, access/haul road resurfacing, clearing and grubbing, bike/pedestrian rerouting, soil transportation, and soil stockpiling, may result in increased levels of blowing dust that may settle on the vegetation surrounding construction areas. Construction dust emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and the prevailing weather conditions. Fugitive dust emissions could be generated by ground-disturbing activities and transport of material between the Otay River Floodplain Site and the Pond 15 Site. The proposed action is subject to San Diego County Air Pollution Control District (SDAPCD) Rule 55, Fugitive Dust Control. This rule requires that the proposed action take steps to restrict visible emissions of fugitive dust beyond the property line. Compliance with Rule 55 would limit fugitive dust (fine and coarse particulate matter (PM_{10} and $PM_{2.5}$)) that may be generated during grading and construction activities. To account for dust control measures in the calculations, it was assumed that the active sites would be watered at least twice daily in compliance with SDAPCD Rule 55.





- Otay River Floodplain Restoration Site
- Project Feature (PF)
- Permanent Impact
- Temporary Impact

Waters of the U.S.

- Wetlands, ACOE/RWQCB/CCC, Non-Section 10
- Non-wetlands, ACOE/RWQCB/CCC, Section 10 Tidal
- Non-wetlands, CCC only

Vegetation Communities and Land Covers

- ESTB, Brackishwater
- FWM, Coastal and Valley Freshwater Marsh
- IS, Isocoma Scrub
- MFS, Mule Fat Scrub
- ORFR, Otay River Floodplain Restoration
- SCSM, Southern Coastal Salt Marsh
- DH, Disturbed Habitat
- DEV, Developed Land
- CAM, Cismontane Alkali Marsh

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AERIAL SOURCE: SANDAG IMAGERY 2014

FIGURE 4.3-7

Project Features Jurisdictional Delineation Impacts

Otay River Estuary Restoration Project (ORERP)

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Pond 15 Restoration Site
Project Feature (PF)
Permanent Impact
Temporary Impact

Waters of the U.S.

Wetlands (ACOE/RWQCB/CCC) (Non-Section 10)
Non-wetlands (ACOE/RWQCB/CCC) (Non-Section 10)
Non-wetlands (ACOE/RWQCB/CCC) (Section 10 Tidal)

Vegetation Communities and Land Covers

BAY, Bay
BCH, Beach
DEV, Developed Land
DH, Disturbed Habitat
ESTB, Brackishwater
SCSM, Southern Coastal Salt Marsh
SF, Salt Flats
SPL, Salt Pond Levee
WAT, Open Water
dSCSM, Disturbed Southern Coastal Salt Marsh

AERIAL SOURCE: SANDAG IMAGERY 2014

FIGURE 4.3-8

Project Features Jurisdictional Impacts

Otay River Estuary Restoration Project EIS

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Although the placement of excess material from excavation activities into two stockpiles adjacent to the Otay River Floodplain Site would not result in direct impacts to sensitive habitat or wetlands, the potential erosion from the stockpiles could impact the wetlands that are located near the stockpiles. As a result, MM-VIS-2 (Section 4.2.1, Topography/Visual Quality) has been incorporated into the proposed action to reduce impacts from the potential for runoff, sedimentation, and erosion of these stockpiles to below a level of significance. MM-VIS-2 includes the revegetation of the stockpiles based on a plan that would be prepared by a qualified restoration specialist, including an appropriate hydroseed mix, treatment, and monitoring.

Throughout construction, the contractor would be required to comply with National Pollutant Discharge Elimination System (NPDES) stormwater permit conditions, which would require that a stormwater pollution prevention plan (SWPPP) be prepared and implemented by the contractor. The SWPPP, which would remain in effect until all aspects of the proposed action are completed, would identify the best management practices (BMPs) to be implemented throughout construction to protect water and sensitive resources and to avoid temporary impacts. Indirect impacts to habitat and vegetation communities/jurisdictional waters at the Otay River Floodplain Site would be considered significant. MM-GEO-1 (see Section 4.2.2, Geology, Soils, and Agricultural Resources) includes preparation and implementation of a SWPPP. The measures described in MM-GEO-1 will address the BMP needs of the site for the duration of the construction, including periods when no construction activity is taking place (generally during the nesting season). With the implementation of MM-GEO-1, all indirect impacts to biological resources from runoff and erosion would be reduced to less than significant. To ensure the long-term stability of soil stockpiles that would be placed adjacent to the Otay River Floodplain Site, erosion control measures described in MM-GEO-2 have been incorporated into the scope of the proposed action. Implementation of MM-GEO-1 and MM-GEO-2 would reduce the potential for significant adverse impacts related to soil erosion and slope instability to below a level of significance. An analysis of the potential for increased erosion from water and wind as a result of implementation of Alternative B is addressed within the Hydrology and Water Quality section of this EIS (Section 4.2.5).

Sensitive wetlands are adjacent to the Otay River Floodplain Site. Runoff, fugitive dust, and human intrusion into these sensitive areas would potentially result in indirect impacts and degradation of the habitat, resulting in significant impacts. MM-GEO-1 and compliance with SDAPCD Rule 55 would provide mitigation and address fugitive dust and runoff. Potential intrusion by humans may cause impacts as a result of humans trampling vegetation and disturbing wildlife that live in the vegetation. Therefore, MM-BIO-4 is provided to inform construction workers of the presence of the sensitive habitat and help prevent accidental intrusion. MM-BIO-4 would require protective orange fencing and silt fencing around the sensitive habitat that is located adjacent to the stockpiles, in the wetlands in the Otay River, and surrounded by the staging area. The orange and silt fencing will be placed a distance from the

sensitive habitat to provide a buffer of at least 25 feet. Following implementation of MM-BIO-4, impacts would be reduced to less than significant.

Accidental spills of fuel, lubricants, or coolants, if occurring in or adjacent to sensitive habitat, can create potentially toxic and harmful conditions for the habitat and wetlands. Spills that occur in sensitive habitat are potentially significant; therefore, MM-HYD-2 is provided (see Section 4.2.5). MM-HYD-2 would require that all construction equipment and vehicles be parked, and refueling and maintenance occur, only in designated areas. Following implementation of MM-HYD-2, impacts would be reduced to less than significant.

Pond 15 Site

Implementation of Alternative B may result in indirect impacts from fugitive dust, erosion, runoff, human intrusion, trampling of vegetation, and toxic spills as a result of construction activities during restoration, similar to the discussion for the Otay River Floodplain Site. Indirect impacts would be addressed through compliance with SDAPCD Rule 55, MM-GEO-1, MM-GEO-2, MM-BIO-4, and MM-HYD-2.

The proposed restoration activities at the Pond 15 Site may result in indirect temporary construction-related impacts to native vegetation and jurisdictional waters in the Palomar channel and the mudflats and salt marsh vegetation located along the edge of San Diego Bay to the north of Ponds 14 and 15 as a result of fugitive dust and sedimentation, in addition to significant impacts from runoff. The impact would be the same as that presented for the Otay River Floodplain Site, but the Pond 15 Site may also have increased sedimentation and dust issues due to trucks hauling dirt adjacent to sensitive habitat areas. Sedimentation adjacent to the Pond 15 Site is potentially significant; therefore, MM-BIO-4 is provided. MM-BIO-4 requires that trucks be covered, silt fencing be in place, and the area be monitored for indirect impacts. With implementation of the same mitigation measures required for the Otay River Floodplain Site, including MM-BIO-4, impacts would be less than significant.

San Diego Unified Port District Lands

A total of 1.30 acres of Port lands are included in the Pond 15 Site and will be graded to create the opening of the pond, allowing it to become tidal wetlands. The analysis of this portion of the Pond 15 Site is the same as that provided above. Impacts and mitigation measures for the impact to the 1.30 acres of Port lands are the same as those for the Pond 15 Site.

Project Features

Similar to the indirect impacts described for the Otay River Floodplain Site, implementation of the project features under Alternative B could result in impacts from fugitive dust, erosion,

runoff, human intrusion, trampling of vegetation, and toxic spills as a result of construction activities during restoration. Construction activities to establish the staging area, install berms, install temporary drainage crossings, modify levees, and establish a temporary bike route could result in increased levels of blowing dust that may settle on the vegetation surrounding construction areas. Construction dust emissions associated with the project features would vary depending on the level of activity, the specific type of operation, and the prevailing weather conditions. Fugitive dust emissions could be generated by ground-disturbing activities and transport of material between the Otay River Floodplain Site and the Pond 15 Site.

Implementation of project features associated with Alternative B could generate windblown dust that would settle on vegetation and jurisdictional resources surrounding the restoration construction areas at the Otay River Floodplain Site and Ponds 13, 14, 15, 28, and 29. Indirect impacts to habitat and vegetation communities resulting from dust and runoff would be significant.

The impact for the project features is the same as that presented for the Otay River Floodplain Site. As a result, the project features would have significant indirect impacts on habitat and vegetation communities and jurisdictional waters. Indirect impacts would be addressed through compliance with SDAPCD Rule 55, MM-GEO-1, MM-GEO-2, MM-BIO-4, and MM-HYD-2. With the implementation of these measures, all indirect impacts to biological resources from fugitive dust and runoff would be reduced to less than significant.

Erosion and runoff also could occur from the exposed soils located in the stockpile areas (PF 3). Erosion leading to runoff and sedimentation in the sensitive habitat and wetlands adjacent to the stockpiles could result in indirect impacts on sensitive vegetation. MM-VIS-2 and MM-GEO-2 include the planting of stockpiled soils to prevent windblown dust impacts on vegetation and runoff from the stockpile impacting adjacent wetland habitat.

Mitigation Measures

Changes to the habitats in south San Diego Bay (South Bay) began in 1871 with the construction of the La Punta Salt Works, a small-scale solar salt evaporation facility. Between 1911 and 1916, the area used for solar salt production was expanded to include the entire end of the South Bay. In 1933, the land now occupied by Ponds 11, 12, 14, and 15 was acquired for incorporation into the La Punta Salt Works. By 1942, Ponds 12, 14, and 15 had been constructed, followed later by the construction of Pond 11. Based on the existing elevations of these ponds, it appears that in creating the salt ponds, significant portions of the intertidal mudflat and salt marsh habitat at the south end of San Diego Bay were eliminated (USFWS 2006).

The native upland and wetland habitat of the Otay River floodplain was all but eliminated during the 20th century as a result of industrial, agricultural, and municipal activities. Maps dating back as far as 1916 depict the Otay River in its present channelized configuration. A narrow corridor

of salt marsh, freshwater marsh, and native riparian habitat are supported within the river channel, and remnant maritime succulent scrub habitat can still be found in the vicinity of the railroad right-of-way that extends between the south end of the South Bay Salt Works and the Otay River channel (USFWS 2006).

The loss of vegetation communities at the Otay River Floodplain Site, Pond 15 Site, and other project features would be offset by the restoration of approximately 114.26 acres of tidally influenced habitat within this portion of the San Diego Bay NWR. The benefits of restoration, which would be accomplished through a combination of active revegetation and natural recruitment, would include improved biological productivity in existing wetland areas and the reestablishment of the historical landscape in areas changed by human disturbance during the era of modern impacts associated with widespread urban development in the watershed. Currently, approximately half of the coastal wetlands in the Southern California Bight are either frequently closed or always closed to tidal influence, primarily as a result of human disturbance. Such closures reduce the availability of nutrients and dramatically alter salinities in the water column and in the soil. Many salt marsh plant species cannot tolerate these conditions, which over time have resulted in reduced native plant species diversity and lower habitat values (USFWS 2006). The salt ponds, including Pond 15, receive no benefit from tidal flushing. As a result, there are opportunities available in the San Diego Bay NWR for improving habitat values for wildlife, and for avian species in particular (USFWS 2006). Construction Methods (see Section 4.3.2, Impacts to Endangered and Threatened Species and Other Species of Concern) would result in substantial restoration of habitat for tidal wetland species, a net increase in wetland area, and minimal impact to sensitive habitats or species.

The restoration areas would either abut or be surrounded by open space areas, and a substantial undeveloped buffer would surround the restoration sites to ensure that wetland habitat and sensitive species would remain undisturbed. Restoration of the Otay River Floodplain Site and Pond 15 Site would result in the return of tidal action to areas that have been isolated from San Diego Bay for more than 80 years. Historic maps indicate that the area proposed for restoration is former intertidal mudflat and salt marsh that has been filled for agriculture and salt production. Thus, the potential for successful restoration is high. The restoration plans call for establishment through excavation, placement of fill materials, and grading of a mixture of subtidal, intertidal, and mudflat wetland areas that would support a full array of estuarine and intertidal organisms. The conversion of the former and existing evaporation ponds to intertidal salt marsh, mudflats, and subtidal habitat would provide substantial fish habitat where none exists today. The role of unvegetated tidal creeks and sloughs as breeding areas and nurseries for estuarine-dependent fish has been well studied. The transient use of the intertidal salt marsh by species such as California killifish (*Fundulus parvipinnis*) has likewise been demonstrated. These values would all be enhanced by the proposed action. Furthermore, the intertidal mudflats created by the proposed action would provide breeding habitat for the goby species (Gobiidae) that are prevalent in Agua Hedionda Lagoon, which is the location of the affected

habitat resulting from the Carlsbad Desalination Plant. To offset the potential impingement and entrainment impacts from the Carlsbad Desalination Plant, the MLMP requires creation, enhancement, or restoration of aquatic and wetland habitat, and ensures long-term performance, monitoring, and protection. Providing breeding habitat for goby species is one such measure of providing habitat similar to that affected by the Carlsbad Desalination Plant. The preferred restoration plan would provide a diverse assemblage of wetland habitats, including cordgrass (*Spartina* spp.)-dominated salt marsh, the preferred nesting and foraging habitat of light-footed Ridgway's rail (*Rallus obsoletus levipes*), and fishery resources that support California least tern (*Sternula antillarum browni*). It would also provide shallow subtidal habitat for nursery grounds for California halibut (*Paralichthys californicus*)**.**

MM-BIO-1 To avoid or minimize the permanent loss of native habitat or plant communities resulting from project features, any areas that are bridged, reinforced, or widened to accommodate construction equipment would be restored to pre-construction conditions and vegetated with appropriate native plant species once construction is complete per the Construction Methods as described in Section 2.3.2.4 of this Environmental Impact Statement. This includes the 1.36 acres of jurisdictional impacts. To avoid or minimize any long-term impacts to habitat or vegetation, staging areas, access routes, and other disturbed areas shall be decompacted and recontoured to ensure proper site drainage, and revegetated with appropriate native species. Any temporary equipment, structures, or utilities (e.g., water, power) installed at the project site shall be removed at the completion of construction. Impacts from project features that cannot be restored to pre-construction conditions due to the requirements of the construction will be mitigated per the restoration outlined in the FRP. In addition, the temporary impacts (0.62 acre) to the California Coastal Commission-only wetlands (mule fat scrub and Otay River Floodplain Restoration Site) shall be replaced in kind immediately upon completion of construction.

MM-BIO-2 Mitigation for conversion of wetlands from one type to another resulting from implementation of Alternative B shall be provided in accordance with the Final Restoration Plan (FRP; Appendix C) at a 1:1 ratio. Mitigation is provided at a 1:1 ratio for the impact to 5.77 acres in the Otay River Floodplain Site and 84.37 acres at the Pond 15 Site. Mitigation shall provide 90.14 acres of tidally influenced wetlands. The combined total for the mitigation is 114.26 acres.

MM-BIO-3 Mitigation for permanent impacts to wetlands resulting from implementation of Alternative B shall be provided in accordance with the FRP (Appendix C) at a 4:1 ratio. Mitigation is provided at a 4:1 ratio for the loss of 0.66 acres in the Otay River Floodplain Site, 3.77 acres at the Pond 15 Site, and 0.98 acre associated with the project features permanent jurisdictional impacts. Mitigation shall

provide 21.64 acres of tidally influenced wetlands. The combined total for the mitigation is 114.26 acres.

MM-BIO-4 Prior to construction, the boundaries of the project site, including staging areas, stockpiles, and truck haul routes, shall be flagged and protective fencing/silt fencing shall be installed to the satisfaction of the San Diego Bay National Wildlife Refuge (NWR) Manager or designated project biologist as approved by the U.S. Fish and Wildlife Service (Service). Silt fencing shall also be installed around all existing cismontane alkali marsh to protect it from sedimentation, excessive runoff, and human intrusion. Construction plans shall include notes or mapping of the location of the protective fencing. In addition, a biological monitor shall be present during the pre-construction meeting and during initial grading of these areas to ensure that no construction activity occurs outside the designated construction boundaries. The biological monitor shall be on site during clearing, grubbing, and grading activities to ensure that the approved limits of disturbance are not exceeded. The biological monitor shall also conduct periodic monitoring of stockpiles, storage areas, and protective fencing. Before construction activities occur in areas containing sensitive biological resources, all workers shall be educated by an approved biologist to recognize and avoid those areas that have been marked as sensitive.

In addition to the measures described under MM-HYD-3 and MM-HYD-4, the project biologist shall monitor conditions in sensitive habitat areas located adjacent to ongoing construction to ensure that no impacts related to sedimentation are occurring. If impacts are noted, additional measures shall be developed and implemented to minimize the effects of dust and sedimentation on sensitive resources.

4.3.1.3 Alternative C

Similar to Alternative B, habitat restoration activities under Alternative C would require the removal of the existing vegetation within a 33.51-acre area in the Otay River Floodplain Site, followed by excavation of this area to achieve elevations capable of supporting subtidal wetland habitat. Unlike Alternative B, the Otay River Floodplain Site would be recontoured to include a subtidal channel encompassing about 4.5 acres of the site. Also proposed are intertidal mudflats (including frequently flooded and frequently exposed zones) and intertidal coastal salt marsh (including low, mid, and high salt marsh zones). The excavated material would be used as fill material at the Pond 15 Site to increase the bottom elevation of the pond and allow for more acreage of emergent vegetated coastal salt marsh to be restored there than would be possible without the addition of fill soils. The Pond 15 Site would also be recontoured to create similar but deeper tidally influenced subtidal and coastal salt marsh zones. As discussed in Section 2.3

of this EIS, approximately 4.5 acres of subtidal habitat, approximately 25 acres of intertidal coastal salt marsh habitat and mudflat (about 4.7 acres less than that provided under Alternative B), and 4.1 acres of upland habitat would be created at the Otay River Floodplain Site.

Approximately 10 acres of subtidal habitat, 73 acres (approximately 1.5 acres less than that provided under Alternative B) of coastal salt marsh habitat and mudflat, and approximately 7.8 acres (as compared to 6.26 acres under Alternative B) of upland habitat would be created at the Pond 15 Site. Under Alternative C, the Pond 15 Site would support about 12 acres of low salt marsh, 28 acres of mid salt marsh, and 14 acres of high salt marsh vegetation, as compared to 15.6 acres of low salt marsh, 35 acres of mid salt marsh, and 5 acres of high salt marsh vegetation under Alternative B.

A mix of native wetland species would be planted at both sites to create low, mid, and high coastal salt marsh vegetation communities. A summary of the vegetation communities that would be installed based on anticipated sea level and water depth in 2020 is provided in Table 4.3-10. Tidal hydraulics were analyzed to review the pre-action versus post-action change in Nestor Creek and the Otay River (Appendix G2). The tidal hydraulics modeling results were reevaluated to consider potential proposed action impacts on areas outside the project site, specifically Nestor Creek and the upper reach of the Otay River intertidal zone upriver from the Bayshore Bikeway Bridge**.** Based on comparisons of hydroperiod functions pre- and post-action, it was concluded that Alternative C would have a negligible effect on tidal inundation in the upper reach of the Otay River and would result in a slight reduction of tidal muting and an improvement in high water tidal inundation of Nestor Creek.

Based on the requirements of the MLMP (Poseidon 2008), the total densities and numbers of species of fish, macroinvertebrates, and birds is required to be similar to those within similar habitat at a reference location within 4 years of construction. Thus, although the restored habitat may not be fully mature and occupied by wildlife in the first couple of years, it is anticipated to meet the requirements within the first few years after planting.

Table 4.3-10
Proposed Restoration Vegetation Communities for Alternative C – 2020

Restoration Area	Otay River Floodplain Site (acres)	Pond 15 Site (acres)
Subtidal	4.48	10.23
Mudflat – frequently flooded	4.43	16.11
Mudflat – frequently exposed	2.00	2.16
Low salt marsh	8.34	12.11
Mid salt marsh	6.21	28.06
High salt marsh	3.94	14.39

Table 4.3-10
Proposed Restoration Vegetation Communities for Alternative C – 2020

Restoration Area	Otay River Floodplain Site (acres)	Pond 15 Site (acres)
*Total Created Wetland Habitat**	*29.41*	*83.06*
Upland habitat	4.10	7.85
Total *	**33.51**	**90.90**

Source: Appendix J.
* Acreage may not total due to rounding.

This restoration planning effort also factors in the potential for a 4.68- to 24-inch sea-level rise by 2050 (State of California 2013). For the purpose of complete disclosure, a summary of the habitat configuration and vegetation communities that would be expected based on anticipated 24-inch sea-level rise in 2050 is provided in Table 4.3-11. Regardless of sea-level rise, there would be no decrease in the total acreage of the restored wetlands at either site. The proposed restoration is illustrated in Figures 2-7a through 2-7d.

Table 4.3-11
Proposed Restoration Vegetation Communities for Alternative C – 2050

Restoration Area	Otay River Floodplain Site (acres)	Pond 15 Site (acres)
Subtidal	4.48	14.40
Mudflat – frequently flooded	15.04	24.95
Mudflat – frequently exposed	1.48	2.76
Low salt marsh	6.96	25.78
Mid salt marsh	1.99	17.31
High salt marsh	0.36	3.08
*Total Created Wetland Habitat**	*30.31*	*88.28*
Upland habitat	3.20	2.63
Total*	**33.51**	**90.90**

Source: Appendix J.
* Acreage may not total due to rounding.

Direct Impacts

Habitat and Vegetation Communities

Otay River Floodplain Site

The analysis of impacts on habitat and vegetation communities and jurisdictional waters is the same as discussed for Alternative B. Alternative C would result in the direct conversion of 29.41 acres of existing upland habitat and disturbed non-native and native vegetation within the Otay River Floodplain Site to wetland communities. Included would be the conversion of 12.23 acres of native

vegetation (i.e., *Isocoma* scrub and southern coastal salt marsh) to wetlands. Table 4.3-12 provides a summary of the impacts to existing vegetation communities and land cover types at the Otay River Floodplain Site (Figure 4.3-1). The entire 33.51-acre Otay River Floodplain Site would be permanently impacted for the conversion to native habitats, predominantly wetlands.

Although implementation of Alternative C would result in the conversion of existing habitat on the site, the impacted area would ultimately support subtidal wetland vegetation and native wetland and upland habitat, restoring historical wetland habitat values to the site. The restoration would include approximately 18 acres of salt marsh creation.

Restoration conducted in the Otay River Floodplain Site would be limited to the portion of the floodplain located west of Nestor Creek, as described for Alternative B.

Similar to Alternative B, objectives of the restoration for Alternative C would contribute to the overall value of the wetlands, as summarized in the FRP (Appendix C). The objectives are summarized under Alternative B.

Table 4.3-12
Summary of Impacts to Vegetation Communities and Land Cover Types at the Otay River Floodplain Site for Alternative C

Vegetation Community/ Land Cover Type	Impact for Restoration to Upland Habitat (acres)	Impact for Restoration to Wetlands (acres)	Total Impact Areas (acres)
Brackishwater	—	0.77	0.77
Disturbed habitat	1.83	6.85	8.68
Former salt pond bottom and borrow area	1.27	9.56	10.83
Isocoma scrub	1.00	10.97	11.97
Southern coastal salt marsh	—	1.26	1.26
Total	**4.10**	**29.41**	**33.51**

Source: Appendix J.

The wildlife foraging functions of the upland and disturbed vegetation communities would continue to be provided in the areas designated for upper salt marsh habitat and upland habitat. The impacts of conversion of the existing habitat values on the site would be beneficial, providing restoration of coastal wetland habitat to the Otay River Floodplain Site. As a result, the conversion of the *Isocoma* scrub uplands to tidal wetlands is considered adverse but less than significant in terms of upland habitat loss, and would be beneficial overall in that more-productive and generally scarcer salt marsh habitat would be created in its place. Although some areas of southern coastal salt marsh (1.26 acres) would be temporarily impacted, the restoration would result in a substantial increase in tidal and overall wetland acreage, including low, mid, and high salt marsh habitat, for a total of 29.41 acres of wetlands. Therefore, there would be a significant beneficial impact due to restoration of the Otay River Floodplain Site.

Pond 15 Site

Implementation of Alternative C would involve converting open water habitat within an existing solar salt pond to a subtidal channel, intertidal mudflats (including frequently flooded and frequently exposed zones), and intertidal salt marsh mudflat (including low, mid, and high salt marsh zones) by recontouring the Pond 15 Site. Similar to Alternative B, a total of 1.30 acres of land under the jurisdiction of the Port would be impacted.

Similar to the Otay River Floodplain Site and as discussed under Alternative B, very limited native habitat or vegetation communities are present on the Pond 15 Site, which currently includes open water habitat associated with a solar salt evaporation pond. Small patches of southern coastal salt marsh and disturbed southern coastal salt marsh compose only 1% (0.94 acres) of the site.

Impacts to the Pond 15 Site as a result of implementation of Alternative C would be similar to the impacts discussed under Alternative B. The proposed restoration activities at the Pond 15 Site would result in direct impacts to 90.90 acres in the Pond 15 Site (Table 4.3-13; Figure 4.3-2). As a result of the proposed grading, the site would ultimately support native coastal wetland habitat (i.e., subtidal and intertidal wetlands) and native vegetation (i.e., coastal salt marsh). Table 4.3-13 provides a summary of the impacts to existing vegetation communities and land cover types at the Pond 15 Site.

Table 4.3-13
Summary of Impacts to Vegetation Communities and Land Cover Types at the Pond 15 Site for Alternative C

Vegetation Community/ Land Cover Type	Impact for Restoration to Upland Habitat (acres)	Impact for Restoration to Wetlands – San Diego Bay NWR (acres)	Impact for Restoration to Wetlands – Port Lands (acres)	Total Impact Area (acres)
Bay	—	—	1.15	1.15
Beach	—	0.01	—	0.01
Disturbed habitat	2.48	0.29	—	2.77
Open water	3.16	79.17	—	82.33
Salt pond levee	1.65	2.02	—	3.67
Southern coastal salt marsh	0.52	0.20	0.15	0.87
Southern coastal salt marsh – disturbed	0.04	0.06	—	0.10
Total	**7.85**	**81.75**	**1.30**	**90.90**

Implementation of Alternative C would result in the modification of existing habitat and native vegetation communities for restoring the historical tidal wetland habitat value in this area to support native plant, fish, and wildlife species. Adequate acreage of native habitats would be restored (83.05 acres of wetlands total) within the Pond 15 Site to offset the loss of open water and southern coastal salt marsh habitat.

Similar to Alternative B, objectives of the restoration in accordance with Alternative C would contribute to the overall value of the wetlands, as summarized in the FRP (Appendix C). The objectives are summarized under Alternative B.

As summarized in the FRP and described for Alternative B, the impacts of conversion of the existing habitat values on the site would be beneficial by providing restoration of coastal wetland habitat to the Pond 15 Site. As a result, the conversion of open water to tidal wetlands is considered adverse but less than significant in terms of habitat loss, and would be beneficial overall in that more-productive and generally scarcer salt marsh habitat would be created in its place. Although some areas of southern coastal salt marsh (0.97 acres) would be temporarily impacted, restoration would result in a substantial increase in salt marsh and overall wetland acreage, including low, mid, and high salt marsh habitat, for a total of 83.05 acres of wetlands. Therefore, there would be a significant beneficial impact due to the restoration of the Pond 15 Site.

San Diego Unified Port District Lands

Similar to Pond 15 under Alternative B, a total of 1.30 acres of Port lands are included in the Pond 15 Site and will be graded to create the opening of the pond, allowing it to become tidal wetlands. The acreage is presented in Table 4.3-13 and the impact is the same as the analysis provided under Alternative B.

Project Features

The potential direct impacts to habitat and vegetation communities from the project features due to implementation of Alternative C would be the same as those described for Alternative B (Figures 4.3-1 through 4.3-4). The 0.62-acre impact to Commission-only wetland vegetation would be restored in place to pre-construction conditions (MM-BIO-1).

Jurisdictional Waters

Otay River Floodplain Site

Restoration activities at the Otay River Floodplain Site, as proposed under Alternative C, would result in direct impacts to jurisdictional waters. Approximately 6.43 acres of Corps, Regional

Board, and Commission jurisdictional wetlands are present within the 33.51-acre Otay River Floodplain Site (Table 4.3-14). All of these wetlands would be impacted during grading.

Restoration would result in 29.41 acres of jurisdictional wetlands (mudflat, low, mid, and high salt marsh), including 23.61 acres of wetlands created within current upland areas and 5.80 acres of high-quality wetland habitat created by recontouring and regrading existing wetlands. This gain in wetland acreage, combined with the expected increased productivity due to increased functions and services that a restored tidal system would provide, represents a beneficial impact. Table 4.3-14 provides a summary of the impacts to jurisdictional wetlands and waters at the Otay River Floodplain Site.

As discussed under Alternative B, a CRAM Report was prepared by Dudek in 2016 (Appendix J). The results of the CRAM analysis confirm that there would be a substantial improvement in the functions and services of wetlands and waters due to implementation of the proposed action for Alternative C.

Table 4.3-14
Summary of Impacts to Jurisdictional Waters
at the Otay River Floodplain Site for Alternative C

Vegetation Community	Corps, Regional Board, Commission Jurisdiction		
	Impact for Restoration to Upland Habitat (acres)	*Impact for Restoration to Wetlands (acres)*	*Total Impact Area (acres)*
Non-Wetlands			
Brackishwater	—	0.77	0.77
Former salt pond bottom and borrow area	0.58	2.94	3.52
Wetlands			
Southern coastal salt marsh	—	1.26	1.26
Former salt pond bottom and borrow area	0.05	0.82	0.87
Total	**0.63**	**5.80**	**6.43**

Source: Appendix J.

Implementation of Alternative C would permanently impact 5.80 acres of wetland that would be replaced as described above (Table 4.3-14; Figure 4.3-5). All of the 5.80 acres of wetland would be converted to other wetlands under Alternative C and mitigated at a minimum of a 1:1 ratio in the Otay River Floodplain Site and Pond 15 Site (MM-BIO-5). For the impact to 0.63 acres of jurisdictional wetlands and waters of the United States (former salt pond bottom and borrow area) that would be converted to upland habitat, mitigation at a 4:1 ratio is required (MM-BIO-6).

Pond 15 Site

The proposed restoration activities at the Pond 15 Site would result in direct permanent impacts to jurisdictional waters associated with the solar salt pond, similar to the impacts resulting from Alternative B.

Jurisdictional waters would be affected by filling within the salt pond and removing or otherwise manipulating the earthen salt pond levees. Alternative C would result in a total of 82.77 acres of jurisdictional wetlands (mudflat, low, mid, and high salt marsh) by recontouring and regrading existing wetlands and waters. Alternative C would involve conversion of 88.14 acres of jurisdictional waters (non-wetland) to approximately 83.06 acres of jurisdictional wetlands. Table 4.3-15 provides a summary of the impacts to jurisdictional waters at the Pond 15 Site, and is as described for Alternative B. The impacts to existing jurisdictional waters (non-wetlands), as indicated in Table 4.3-15 (Figure 4.3-6), would be offset by the creation of improved wetland vegetation of tidally influenced jurisdictional wetland waters within the Otay River Floodplain Site and Pond 15 Site.

This gain in wetland acreage, combined with the expected increased productivity of wetland functions that a restored tidal system would provide, represents a beneficial impact. A total of 82.35 acres of non-wetland waters and 0.41 acres of wetlands would be converted to 82.77 acres of high-quality wetlands under Alternative C, and would be mitigated at the mitigation ratio described below as determined by the Corps. This mitigation would be implemented with the combined restoration at the Otay River Floodplain Site and Pond 15 Site. For the impact to the 5.37 acres of salt pond levee, open water, southern coastal salt marsh, and disturbed southern coastal salt marsh that would be converted to upland habitat, mitigation at a 4:1 ratio would be required. The 82.77 acres of predominantly non-wetland waters would be converted to subtidal, intertidal, mudflat, and coastal salt marsh (Figures 2-7a through 2-7d). Table 4.3-15 provides a summary of the impacts to jurisdictional waters at the Pond 15 Site.

Table 4.3-15
Summary of Impacts to Jurisdictional Waters at the Pond 15 Site for Alternative C

	Corps, Regional Board, Commission Jurisdiction			
Vegetation Community	*Impact for Restoration to Upland Habitat (acres)*	*Impact for Restoration to Wetlands – San Diego Bay NWR (acres)*	*Impact for Restoration to Wetlands – Port Lands (acres)*	*Total Impact Area (acres)*
Bay	—	—	1.15	1.15
Beach	—	0.01	—	0.01
Open water	3.16	79.17	—	82.33
Salt pond levee	1.65	2.02	—	3.67

Table 4.3-15
Summary of Impacts to Jurisdictional Waters at the Pond 15 Site for Alternative C

Vegetation Community	Corps, Regional Board, Commission Jurisdiction			
	Impact for Restoration to Upland Habitat (acres)	*Impact for Restoration to Wetlands – San Diego Bay NWR (acres)*	*Impact for Restoration to Wetlands – Port Lands (acres)*	*Total Impact Area (acres)*
Southern coastal salt marsh	0.52	0.20	0.15	0.87
Southern coastal salt marsh – disturbed	0.04	0.06	—	0.10
Total	**5.37**	**81.47**	**1.30**	**88.14**

The Pond 15 Site is an existing industrial solar salt production pond, but it does have some ecological function for migratory birds. As a result, the applicant undertook a "functional lift" assessment in consultation with the Science Advisory Panel appointed by the Commission. This analysis and conclusion is provided under Alternative B. In addition, a CRAM report was prepared and is also summarized under Alternative B. Dudek evaluated the Pond 15 Site from the perspective of the functions and services expected or anticipated after several years (e.g., 5 years) following construction to allow for the establishment of vegetation following the large-scale disturbances resulting from construction. Results of the analysis for the Pond 15 Site indicate that substantially improved functions and services of aquatic resources would result from the proposed action. Further, the ponds and associated islands and shorelines are anticipated to provide much greater biologic functions and services for the target wildlife species compared to the current condition or future condition absent the proposed action, as described in the FRP. The results of the CRAM analysis for the Pond 15 Site confirm that there would be a substantial improvement of the functions and services of wetlands and waters due to implementation of the proposed action.

San Diego Unified Port District Lands

Similar to Pond 15 under Alternative B, a total of 1.30 acres of Port lands that are jurisdictional resources are included in the Pond 15 Site and will be graded to create the opening of the pond, allowing it to become tidal wetlands. The acreage is presented in Table 4.3-15 and the impact is the same as shown in the analysis provided under Alternative B.

Jurisdictional Impacts Summary

With the total restoration, the Otay River Floodplain Site and Pond 15 Site would provide 112.57 acres of jurisdictional wetlands, including native habitat and coastal salt marsh vegetation. A mitigation ratio of 4:1 would be provided for the total jurisdictional impacts of 6.01 acres for

wetlands that are impacted and converted to upland habitat (0.64 acres for the Otay River Floodplain Site and 5.37 acres for the Pond 15 Site). A mitigation ratio of 1:1 is provided for the jurisdictional impacts of 88.57 acres of wetlands converted to tidal wetlands (5.80 acres for the Otay River Floodplain Site and 82.77 acres for the Pond 15 Site). Significant impacts to jurisdictional waters would result from implementation of Alternative C due to conversion of wetlands to upland habitat (4:1 mitigation; MM-BIO-6) and the conversion of wetlands to native wetland communities (1:1 mitigation; MM-BIO-5). Restoration of coastal wetland habitat would represent a direct beneficial impact on vegetation communities in the Pond 15 Site (Table 4.3-16).

Table 4.3-16
Determination of Mitigation Acreage Requirements for Impacts to Jurisdictional Resources from Alternative C

Site	Impact	Mitigation Ratio	Required Mitigation Acreage
Otay River Floodplain Site	5.80 acres conversion of existing wetlands to tidal wetlands	1:1	5.80
Otay River Floodplain Site	0.64 acres conversion of existing wetlands to upland habitat	4:1	2.56
Pond 15 Site	82.77 acres conversion of existing wetlands to tidal wetlands	1:1	82.77
Pond 15 Site	5.37 acres conversion of existing wetlands to upland habitat	4:1	21.48
Project Features	1.36 acres conversion of existing wetlands to tidal wetlands	1:1	1.36*
Project Features	0.98 acre conversion of existing wetlands to upland habitat	4:1	3.92
Project Features	0.62 acre of Commission-only wetland restored in place	1:1	0.62*
		Total Required Mitigation Acreage	**116.53**
		Mitigation Acreage Resulting from Restoration	**112.57**

*These acreages are not included in the total because the restoration will be at the location of impact immediately upon completion.

Project Features

The potential direct impacts to jurisdictional waters from the project features due to implementation of Alternative C would be the same as those described for Alternative B (Figures 4.3-5 through 4.3-8). The temporary impacts to 1.36 acres of wetlands within the project features would be restored to original conditions. These 1.36 acres of impacts would be mitigated at a 1:1 ratio and would be restored in place to pre-project conditions (MM-BIO-1). The 0.98 acres of jurisdictional wetlands that would be converted to uplands as part of the project features would be mitigated at a 4:1 ratio and would be included in the overall restoration per the FRP (MM-BIO-6). The 0.62-acre impact to Commission-only wetlands would be restored in place to pre-action conditions (MM-BIO-1).

As illustrated in Table 4.3-16, the total mitigation requirement, inclusive of the Otay River Floodplain Site, Pond 15 Site, and the permanent impacts resulting from the project features is 116.49 acres. This is greater than the anticipated restoration of 112.57 acres by 3.92 acres.

Offsite purchase of mitigation credit at an approved wetland mitigation bank would provide for the shortfall of restoration acres per MM-BIO-7.

Indirect Impacts

Otay River Floodplain Site

Similar to Alternative B, implementation of Alternative C may result in potential indirect impacts. Mitigation measures are required and include compliance with SDAPCD Rule 55, MM-VIS-2, MM-GEO-1, MM-GEO-2, MM-BIO-4, and MM-HYD-2.

Pond 15 Site

The potential indirect impacts to habitat and vegetation communities and jurisdictional waters from implementation of Alternative C would be the same as those described for Alternative B. Indirect impacts would be addressed by compliance with SDAPCD Rule 55, MM-GEO-1, MM-GEO-2, MM-BIO-4, and MM-HYD-2.

San Diego Unified Port District Lands

A total of 1.30 acres of Port lands are included in the Pond 15 Site and will be graded to create the opening of the pond as discussed for Alternative B. Indirect impacts and mitigation measures for the Port lands are the same as described for Alternative B.

Project Features

The potential indirect impacts to habitat and vegetation communities and jurisdictional waters from the project features due to implementation of Alternative C would be the same as those described for Alternative B. Indirect impacts would be addressed by compliance with SDAPCD Rule 55, MM-VIS-2, MM-GEO-1, MM-GEO-2, MM-HYD-2, and MM-BIO-4.

Mitigation Measures

The loss of vegetation communities at the Otay River Floodplain Site, Pond 15 Site, and project features would be offset by the restoration of approximately 112.57 acres of tidally influenced habitat within this portion of the San Diego Bay NWR. The benefits of restoration, which would be accomplished through a combination of active revegetation and natural recruitment, would include improved biological productivity within existing wetland areas and reestablishment of the historical landscape in areas changed by human disturbance during the era of modern impacts associated with widespread urban development within the watershed.

MM-BIO-5 Mitigation measures for conversion of wetlands from one type to another resulting from implementation of resulting from implementation of Alternative C shall be provided in accordance with the FRP (Appendix C) at a 1:1 ratio. Mitigation is provided at a 1:1 ratio for the impact to 5.80 acres in the Otay River Floodplain Site and 82.77 acres at the Pond 15 Site. Mitigation shall provide 88.57 acres of tidally influenced wetlands. The combined total for the mitigation is 112.57 acres.

MM-BIO-6 Mitigation for permanent impacts to wetlands resulting from implementation of Alternative C shall be provided in accordance with the FRP (Appendix C) at a 4:1 ratio. Mitigation is provided at a 4:1 ratio for the loss of 0.64 acres in the Otay River Floodplain Site, 5.37 acres at the Pond 15 Site and 0.98 acre associated with the project features permanent jurisdictional impacts. Mitigation shall provide 27.96 acres of tidally influenced wetlands. The combined total for the mitigation is 112.57 acres.

MM-BIO-7 Permanent impacts to wetlands resulting from implementation of Alternative C would not be entirely offset by the wetland acreage provided as part of the FRP. The total mitigation requirement based on the mitigation ratios and impacts is 116.53 acres. The acreage that is provided per the FRP is 112.57, resulting in a deficit of 3.96 acres. This deficit shall be mitigated through the purchase of wetland mitigation credits at an agency-approved mitigation bank for a total of 3.96 credits.

Similar to Alternative B, with implementation of MM-BIO-1, MM-BIO-4, MM-GEO-1, MM-GEO-2, MM-HYD-2, and MM-VIS-2 and compliance with SDAPCD Rule 55, all direct and indirect impacts to biological resources would be reduced to less than significant. Additionally, MM-BIO-7 would mitigate for permanent impacts to wetlands that would result from implementation of Alternative C. Following implementation of mitigation measures, impacts would be less than significant.

4.3.2 Impacts to Endangered and Threatened Species and Other Species of Concern

The direct and indirect impacts to Federally and State-listed 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 the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service (Service or USFWS), or by the California Native Plant Society, or any avian species identified as a Bird of Conservation Concern as a result of implementing the alternatives described herein are evaluated below. Cumulative impacts associated with

endangered and threatened species and other species of concern are discussed in Section 4.6, Cumulative Impacts, of this EIS.

Significance Threshold: An impact 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 the California Department of Fish and Wildlife or the Service, or by the California Native Plant Society, or any avian species identified as a Bird of Conservation Concern (USFWS 2008) 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.

The Otay River Floodplain Site offers low habitat value for wildlife species, primarily for migratory birds and common upland species, but also provides foraging habitat for a number of raptor species. The Federally and State-listed endangered light-footed Ridgway's rail and the State-listed endangered Belding's Savannah sparrow (*Passerculus sandwichensis beldingi*) have both been observed on the Otay River Floodplain Site, and a number of other species of concern, as listed in Table 3.3-9, have also been observed on the site (see Figure 3.3-14 in Section 3.3). The Federally and State-listed endangered California least tern, Federally listed threatened western snowy plover (coastal population) (*Charadrius alexandrinus nivosus*), and the State endangered Belding's Savannah sparrow have been observed on the Pond 15 Site. Listed species and other species of concern that have potential to occur on the overall project site are addressed in Table 3.3-7 for plants and in Tables 3.3-9 and 3.3-11 for wildlife. Species that were determined to be absent or that have low or no potential are included in Tables 3.3-8 for plants and in Tables 3.3-10 and 3.3-12 for wildlife.

4.3.2.1 Alternative A

Direct Impacts

Otay River Floodplain Site

Under Alternative A, no restoration activities would occur on the Otay River Floodplain Site, Pond 15 Site, or the sites where project features would be implemented under the action alternatives. Existing habitats would not be altered and no disturbance from construction activities would occur.

No Federally or State-listed plant species occur on the Otay River Floodplain Site. Alternative A would not result in the direct mortality of, habitat loss for, lowered reproductive success of, or fragmentation of habitat for a Federally or State-listed plant or wildlife species or other species of concern. Therefore, no direct impacts would occur as a result of Alternative A.

Pond 15 Site

No Federally or State-listed plant species occur on the Pond 15 Site. Alternative A would not result in the direct mortality of, habitat loss for, lowered reproductive success of, or fragmentation of habitat for a Federally or State-listed plant or wildlife species or other species of concern. Therefore, no direct impacts would occur as a result of Alternative A.

San Diego Unified Port District Lands

Impacts for the Port lands would be the same as those for the Otay River Floodplain Site.

Project Features

Alternative A would not result in the implementation of project features; therefore, impacts would not occur on any Federally or State-listed plant or wildlife species or other species of concern.

Indirect Impacts

Otay River Floodplain Site

No Federally or State-listed plant species occur on the Otay River Floodplain Site. Alternative A would not result in the direct mortality of, habitat loss for, lowered reproductive success of, or fragmentation of habitat for a Federally or State-listed plant or wildlife species or other species of concern. Therefore, no indirect impacts would occur as a result of Alternative A.

Pond 15 Site

No Federally or State-listed plant species occur on the Pond 15 Site. Alternative A would not result in the direct mortality of, habitat loss for, lowered reproductive success of, or fragmentation of habitat for a Federally or State-listed plant or wildlife species or other species of concern. Therefore, no indirect impacts would occur as a result of Alternative A.

San Diego Unified Port District Lands

Impacts for the Port lands would be the same as those for the Otay River Floodplain Site.

Project Features

Alternative A would not result in implementation of project features; therefore, impacts would not occur to any Federally or State-listed plant or wildlife species or other species of concern.

Mitigation Measures

No significant direct or indirect impacts to listed species or other species of concern would occur under Alternative A; therefore, no mitigation is required.

4.3.2.2 Alternative B

Direct Impacts

Otay River Floodplain Site

Under Alternative B, existing habitats within the 33.51-acre Otay River Floodplain Site and the 90.90-acre Pond 15 Site would be converted to tidally influenced coastal wetland habitat and associated upland habitat and seabird nesting habitat, as discussed in Section 2.3. Locations of special-status species are shown on Figures 3.3-11 through 3.3-16 in Section 3.3.

Currently, available habitat for special-status wetland species is limited on the Otay River Floodplain Site. Small patches of wetland vegetation, including southern coastal salt marsh, remain on approximately 4% (1.26 acres) of the site. Additionally, none of the proposed intertidal or upland habitats are currently supported on the Otay River Floodplain Site.

The proposed restoration activities at the Otay River Floodplain Site would result in direct construction-related impacts to special-status plant species and their habitats (southern coastal salt marsh) (see Figure 3.3-11 in Section 3.3). Although no narrow endemic or Federally or State-listed plant species were observed on the Otay River Floodplain Site, three plant species considered by the California Native Plant Society to be rare, threatened, or endangered in California were detected during focused botanical surveys in 2011: California box-thorn (*Lycium californicum*) (California Rare Plant Rank (CRPR) 4.2), estuary seablite (*Suaeda esteroa*) (CRPR 1B.2), and woolly seablite (*Suaeda taxifolia*) (CRPR 4.2) (Appendix C). Site preparation involving excavation and contour grading would result in the removal of 15 individuals of California box-thorn, 225 individuals of estuary seablite, and 8 individuals of woolly seablite, and approximately 1.26 acres of habitat (southern coastal salt marsh) that supports these species. Impacts due to removal of California box-thorn and woolly seablite would be less than significant due to the low status and low numbers affected with respect to the overall population within the region. Impact to estuary seablite due to the loss of individuals is considered a significant impact; therefore, MM-BIO-8 is provided. MM-BIO-8 requires that estuary seablite be included in the planting palette for the restoration site. With implementation of MM-BIO-8, impacts would be less than significant. In addition, the creation of high marsh and upland habitat would provide additional opportunities for the species to successfully reproduce and reestablish within the site.

The proposed restoration activities at the Otay River Floodplain Site would also result in direct impacts to potentially threatened or endangered wildlife species habitat. Construction dewatering and grading would result in a temporary loss of approximately 1.26 acres of native southern coastal salt marsh habitat that is occupied by the State-listed threatened Belding's Savannah sparrow. In addition to Belding's Savannah sparrow, 10 special-status wildlife species were detected on site or adjacent to the site during the 2011 surveys: northern harrier (*Circus*

cyaneus), Clark's marsh wren (*Cistothorus palustris clarkae*), merlin (*Falco columbarius*), white-tailed kite (*Elanus leucurus*), elegant tern (*Thalasseus* [=*Sterna*] *elegans*), gull-billed tern (*Gelochelidon nilotica*), light-footed Ridgway's rail, burrowing owl (*Athene cunicularia*), short-eared owl (*Asio flammeus*), and San Diego black-tailed jackrabbit (*Lepus californicus bennettii*) (Appendix C). These species could be impacted by the loss of habitat in the Otay River Floodplain Site. However, creation of approximately 33.51 acres of native vegetation communities (i.e., low, mid, and high salt marsh and upland habitat) would provide suitable foraging and nesting habitat for threatened and endangered species on the Otay River Floodplain Site, including salt marsh habitat to support light-footed Ridgway's rail and Belding's Savannah sparrow; upland habitat to support foraging for San Diego black-tailed jackrabbit, short-eared owl, burrowing owl, merlin, and white-tailed kite; and mudflat areas to potentially support western snowy plover. The loss of upland habitat in this area is offset by the proposal to establish native upland vegetation to the east of the restoration site, where the existing non-native vegetation provides limited habitat quality. This native upland vegetation would provide suitable habitat for the upland wildlife species.

The proposed restoration activities at the Otay River Floodplain Site could result in direct temporary construction-related impacts to nesting birds, potentially including threatened or endangered species such as light-footed Ridgway's rail and Belding's Savannah sparrow. Based on the presence of suitable nesting habitat, burrowing owl and northern harrier could nest on site. Nesting failure due to construction activities is a potential impact. However, Construction Methods, as addressed in Section 2.3.2.4, would result in avoidance of these impacts. Avoidance of the breeding season would also result in avoidance of noise impacts on nesting special-status species. Nesting season avoidance Construction Methods include the following:

- Access to the site during construction would be controlled through the use of gates, fencing, and/or site security services. At the end of construction and during the nesting season, as determined by the San Diego Bay NWR biological staff, all equipment would be demobilized.
- Earthwork operations and any other construction activities would be limited to the non-breeding season, as determined by San Diego Bay NWR biological staff, to avoid disturbance during the nesting season. In addition, when the nesting period is confirmed to have ended, activity can commence and site-specific coordination would be undertaken with the Service to determine the details during construction. The Service would disclose dates to avoid for each species. At the end of the nesting dates, coordination with the Service would be undertaken to determine whether remaining species have completed nesting or whether they are nesting in locations that would not be potentially impacted by construction activities.

Burrowing owl, Belding's Savannah sparrow, and light-footed Ridgway's rail are present on the Otay River Floodplain Site all year. Construction on the site could potentially impact these

species. Impacts to these species would be considered significant; therefore, MM-BIO-9 is provided. MM-BIO-9 requires pre-construction surveys in suitable habitat, hazing or moving species if found in proximity to the construction site, and monitoring during construction. With implementation of MM-BIO-9, impacts would be less than significant.

Restoration of the Otay River Floodplain Site to intertidal and upland transitional habitats would provide benefits to the San Diego Bay ecosystem and to the special-status species known to occur or with the potential to occur in wetland areas surrounding the South Bay.

Pond 15 Site

Restoration activities at the Pond 15 Site under Alternative B would result in the loss of 54 individuals of estuary seablite and approximately 0.97 acres of the southern coastal salt marsh habitat that supports this species (see Figure 3.3-12 in Section 3.3). This loss of estuary seablite is considered significant. Similar to the Otay River Floodplain Site, mitigation is provided through MM-BIO-8, which requires that estuary seablite be included in the planting palette at a 2:1 ratio to account for the loss of this species.

Currently, the Pond 15 Site offers moderate habitat availability for threatened and endangered species. The pond may be used for foraging and the levees surrounding it are used for nesting by the Federally endangered California least tern and Federally threatened western snowy plover. The State endangered Belding's Savannah sparrow uses the edges of the levees where salt marsh habitat is present for both foraging and breeding. The Federally threatened East Pacific green sea turtle (*Chelonia mydas*) is also known to occur in the portion of San Diego Bay located to the north of Ponds 14 and 15.

The proposed restoration activities at the Pond 15 Site would result in direct temporary construction-related impacts to threatened or endangered species, including Belding's Savannah sparrow, California least tern, and western snowy plover, as well as special-status species such as black skimmer (*Rynchops niger*), Caspian tern (*Hydroprogne caspia*), gull-billed terns, and double-crested cormorants (*Phalacrocorax auritus*). However, Construction Methods, as addressed in Section 2.3.2.4, including limiting construction activity to outside the breeding season (as determined by the San Diego Bay NWR biological staff), would result in avoidance of these impacts. Implementation of MM-BIO-9, which requires pre-construction surveys and daily monitoring during construction, would avoid direct impacts to listed and special-status species during construction.

The excavation activities associated with breaching the Pond 15 levee has the potential to impact East Pacific green sea turtles that may be present. No turbidity or sedimentation is expected, but during the breach, the hypersaline water of Pond 15 would mix with the water in San Diego Bay (Nordby, pers. comm. 2016). If East Pacific green sea turtles are present at the

time of the breach, impacts may occur on this species. Impacts to East Pacific green sea turtle are considered significant; therefore, MM-BIO-10 is provided. MM-BIO-10, which has been incorporated into the scope of the project, requires that a qualified biologist monitor the area north of the outer salt pond levee prior to and during the levee breaching process to confirm that no turtles are present in the area. The monitor has the authority to stop work if a sea turtle is identified within the project vicinity. With implementation of MM-BIO-10, impacts to sea turtles would be less than significant.

San Diego Unified Port District Lands

A total of 1.30 acres of Port lands are included in the Pond 15 Site and will be graded to create the opening of the pond. Impacts and mitigation measures for the Port lands are the same as described for Pond 15.

Project Features

Direct impacts from implementation of the project features could potentially result in impacts on species similar to those resulting from construction activities at the Otay River Floodplain Site and Pond 15 Site. With implementation of MM-BIO-8, MM-BIO-9, and MM-BIO-10, impacts would be reduced to less than significant.

Indirect Impacts

Implementation of Alternative B would potentially result in significant indirect impacts to threatened, endangered, and other special-status species, including special-status plant species. Indirect impacts to breeding special-status species would occur if construction activities occur during the breeding season. These construction activities and human activity may disturb nesting and foraging breeding birds and potentially cause nesting failure.

Otay River Floodplain Site

Similar to the direct impacts, indirect impacts from construction could occur on species that are present in the project site all year. MM-BIO-9 would help to avoid impacts to these species.

The proposed restoration activities at the Otay River Floodplain Site would result in indirect impacts to nesting birds, including special-status species such as light-footed Ridgway's rail and Belding's Savannah sparrow. Nesting failure due to construction activities is a potential impact. However, Construction Methods, as addressed in Section 2.3.2.4, would avoid and minimize impacts to these species. Nesting season avoidance Construction Methods are specified in Section 4.3.2.2.

Through implementation of the Construction Methods, the potential for significant indirect impacts on nesting birds would be avoided.

In addition, per the Construction Methods described in Section 2.3.2.4, the contractor would be required to comply with NPDES stormwater permit conditions, as well as other local, State, and Federal permit/approval requirements. A SWPPP would be prepared and implemented by the contractor to achieve NPDES permit compliance. The contractor would identify and implement BMPs to protect water quality, air quality, and sensitive biological/wildlife resources, and to reduce construction-related noise. These potential impacts are addressed by MM-GEO-1 and would reduce potential indirect impacts to special-status species, including plants, to less than significant.

Pond 15 Site

Implementation of Alternative B may result in indirect impacts to threatened or endangered species if construction activities occur during the breeding season. Such activities may disturb nesting and foraging breeding birds and could cause nesting failure. Avoidance of the bird breeding season would result in avoidance of these significant impacts. The proposed restoration activities at the Pond 15 Site would result in indirect temporary construction-related impacts to nesting birds, including listed and special-status species such as California least tern, western snowy plover, and Belding's Savannah sparrow. Nesting failure due to construction activities is a potential impact. However, Construction Methods, as addressed in Section 2.3.2.4, would result in avoidance of these impacts. Nesting season avoidance Construction Methods are specified in Section 4.3.2.2.

San Diego Unified Port District Lands

A total of 1.30 acres of Port lands are included in the Pond 15 Site and will be graded to create the opening of the pond. Indirect impacts and mitigation measures for the Port lands are the same as described for Pond 15.

As a result, Alternative B, with implementation of the Construction Measures, would minimize indirect impacts to threatened, endangered, or other special-status species at the Pond 15 Site.

In addition, per the Construction Methods described in Section 2.3.2.4, the contractor would be required to comply with NPDES stormwater permit conditions, as well as other local, State, and Federal permit/approval requirements. A SWPPP would be prepared and implemented by the contractor to achieve NPDES permit compliance. The contractor would also implement BMPs to protect water quality, air quality, and sensitive biological/wildlife resources, and to reduce construction-related noise. These potential impacts are addressed by MM-GEO-1.

Project Features

Similar to the Otay River Floodplain Site and Pond 15 Site, limited habitat is available for threatened or endangered species within the project features. The potential indirect impacts to threatened, endangered, and other special-status species within the project features from implementation of Alternative B would be the same as for the Otay River Floodplain Site and Pond 15 Site.

Mitigation Measures

MM-BIO-8 To mitigate for the loss of estuary seablite (*Suaeda esteroa*), a sensitive plant species, from the Otay River Floodplain Site and the Pond 15 Site, estuary seablite shall be included in the planting palette. Estuary seablite planting shall be included in the mid-high marsh habitat and shall be planted at a 2:1 (new:impacted) mitigation ratio. A monitoring plan and success criteria for evaluating estuary seablite populations shall be included in the Revegetation Plan required by MM-VIS-1.

MM-BIO-9 **Special-status birds.** No earlier than 30 days prior to the commencement of clearing, grubbing, and earth movement on the project site, the NWR Manager and/or project biologist shall conduct focused pre-construction surveys for light-footed Ridgway's rail (*Rallus obsoletus levipes*) and other avian species (such as Belding's Savannah sparrow (*Passerculus sandwichensis beldingi*) and burrowing owl (*Athene cunicularia*)) in the vicinity of the project site. Daily surveys for the presence of rails (family Rallidae) and other sensitive bird species shall be conducted at the Otay River crossing, in the Palomar channel, and in other potential rail habitat areas in the vicinity of the project. If sensitive species are present, an air horn or cracker shells shall be deployed to move the birds off the site prior to commencement of construction activities. If noise proves ineffective, physical presence may be used to haze birds and move them to safer parts of the San Diego Bay NWR. Such monitoring shall continue throughout the day to discourage rails and other birds from moving back into the project site, particularly during periods when construction equipment is not operational, such as during breaks. A subsequent pre-construction survey shall be conducted prior to the commencement of construction activities in subsequent years and daily monitoring should be reinitiated until all construction activity ceases on the project site.

MM-BIO-10 **East Pacific green sea turtle.** A qualified biologist shall be on site during preparation for and implementation of the breaching of the Pond 15 levee to

visually monitor for the presence of East Pacific green sea turtle (*Chelonia mydas*) and other sensitive species. The biologist shall have the authority to halt construction when wildlife is observed within or near the project site. Should working vessels (e.g., dredge, barge) be used to breach the Pond 15 levee, travel in the area would adhere to a 5-mile-per-hour speed limit. If pipelines are used, the pipe will be laid such that at least 3 feet of water is available for a turtle to pass through the area at low tide. Land and/or water work crews shall be briefed on how to identify sea turtles and marine mammals that could occur in vicinity of the area affected by the breaching process. The biological monitor shall prepare incident reports of any observed sea turtle activity, and shall provide such reports to the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (Fisheries) within 24 hours of an observation. In the event of an incident involving a marine mammal or sea turtle, the Service shall immediately contact the NOAA Fisheries Southwest Regional Office's Stranding Coordinator, and shall submit a report to NOAA Fisheries within 24 hours.

The proposed action would create and enhance natural coastal wetlands that would support threatened, endangered, and other special-status species that occur or potentially occur on the project site and in the San Diego Bay NWR. The loss of fish and wildlife species habitat at the Otay River Floodplain Site, Pond 15 Site, and project features would be more than offset by the restoration of approximately 114.26 acres of tidally influenced and transitional habitat in this portion of the San Diego Bay NWR. The benefits of restoration, which would be accomplished through a combination of active revegetation and natural recruitment, would include improved biological productivity in existing wetland areas and the reestablishment of the historical landscape in areas changed by human disturbance more than 100 years ago.

4.3.2.3 Alternative C

Under Alternative C, similar to Alternative B, existing habitats within the 33.51-acre footprint on the Otay River Floodplain Site and the 90.90-acre footprint on the Pond 15 Site would be converted to tidally influenced coastal wetland habitat and associated upland transitional and seabird nesting habitat, as discussed in Section 2.3. Locations of special-status species are shown on Figures 3.3-11 through 3.3-16 in Section 3.3.

Direct and Indirect Impacts

Otay River Floodplain Site

The proposed restoration activities at the Otay River Floodplain Site would result in direct impacts to potentially threatened, endangered, and other special-status species habitat. Construction dewatering and grading would result in the temporary loss of approximately 1.26

acres of native salt marsh habitat. However, creation of approximately 33.51 acres of wetland and transitional habitat (including low, mid, and high marsh) would provide additional suitable foraging and nesting habitat for threatened or endangered species on the Otay River Floodplain Site. In addition to potential impacts to special-status species habitat, there is a potential for direct impacts to special-status species, as addressed under Alternative B.

The potential direct and indirect impacts to threatened, endangered, and other special-status species, including plants, on the Otay River Floodplain Site from implementation of Alternative C would be the same as those described for Alternative B.

Pond 15 Site

Currently, the Pond 15 Site offers moderate habitat availability for threatened and endangered species. The habitat value of the site is expected to increase significantly with implementation of the flooding and coastal salt marsh revegetation of the proposed action, which would provide extensive foraging and nesting habitat for threatened and endangered species.

The proposed restoration activities at the Otay River Floodplain Site would result in direct temporary construction-related impacts to nesting birds, including threatened or endangered species such as western snowy plover, California least tern, and Belding's Savannah sparrow. Nesting failure due to construction activities is a potential significant impact. However, Construction Methods, as addressed in Section 2.3.2.4, would result in avoidance of these impacts.

The potential direct and indirect impacts to threatened, endangered, and other special-status species, including plants, on the Pond 15 Site from implementation of Alternative C would be the same as those described for Alternative B.

San Diego Unified Port District Lands

Potential direct and indirect impacts to threatened, endangered, and other special-status species for the Port lands are the same as those described for Alternative B.

Project Features

Similar to the Otay River Floodplain Site and Pond 15 Site, limited habitat is available for threatened or endangered species in the project features. The potential direct and indirect impacts to threatened, endangered, and other special-status species in the project features from implementation of Alternative C would be the same as those described for Alternative B.

Mitigation Measures

The proposed action would create and enhance natural coastal wetlands that would support threatened or endangered species that occur or potentially occur on the project site and in the San Diego Bay NWR. The loss of fish and wildlife species habitat at the Otay River Floodplain Site, Pond 15 Site, and project features would be more than offset by the restoration of approximately 114.30 acres of tidally influenced and upland transitional habitat in this portion of the San Diego Bay NWR. The benefits of restoration, which would be accomplished through a combination of active revegetation and natural recruitment, would include improved biological productivity in existing wetland areas and the reestablishment of the historical landscape in areas changed by human disturbance more than 100 years ago.

Similar to Alternative B, mitigation would be provided through MM-BIO-8, MM-BIO-9, and MM-BIO-10 for significant impacts to special-status plants and wildlife under Alternative C.

4.3.3 Impacts to Wildlife and Fisheries

Impacts to wildlife and fisheries as a result of implementing the proposed alternatives are described in detail in this section. Potential impacts on these resources are characterized by evaluating direct and indirect impacts. Cumulative impacts are addressed in Section 4.6.

Significance Threshold: An impact to wildlife and fisheries would be considered significant if the proposed action 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 any 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.

4.3.3.1 Alternative A

Under Alternative A, no restoration or enhancement activities would occur on the Otay River Floodplain Site, Pond 15 Site, or project features. The disturbed areas in the Otay River Floodplain Site would not be restored to coastal wetlands. The Pond 15 Site would not be restored to tidally influenced subtidal or intertidal habitat. Additionally, the project features associated with the proposed restoration activities would not be implemented.

Direct Impacts

Otay River Floodplain Site

Implementation of Alternative A would not result in any change to the existing Otay River Floodplain Site. As such, no significant impacts to wildlife or fisheries would occur. Existing

habitat quality would remain unchanged, no impacts to existing wildlife or fish populations would result, and no changes to current wildlife or fish movement would occur.

Pond 15 Site

Impacts from implementation of Alternative A for the Pond 15 Site would be the same as those for the Otay River Floodplain Site.

San Diego Unified Port District Lands

Impacts for the Port lands would be the same as those for the Otay River Floodplain Site.

Project Features

Implementation of Alternative A would not result in implementation of any of the project features; therefore, no direct impacts to wildlife or fisheries would occur. Existing habitat quality would remain unchanged, no impacts to existing wildlife or fish populations would result, and no changes to current wildlife or fish movement would occur.

Indirect Impacts

Otay River Floodplain Site

Implementation of Alternative A would not result in a substantial change to the amount or quality of available habitat to wildlife species. As a result, Alternative A would have no significant indirect impact on wildlife or fisheries at the Otay River Floodplain Site.

Pond 15 Site

Impacts from implementation of Alternative A for the Pond 15 Site would be the same as those for the Otay River Floodplain Site.

San Diego Unified Port District Lands

Impacts for the Port lands would be the same as those for the Otay River Floodplain Site.

Project Features

Implementation of Alternative A would not result in implementation of any of the project features; therefore, no indirect impacts to wildlife or fisheries would occur. Existing habitat quality would remain unchanged, no impacts to existing wildlife or fish populations would result, and no changes to current wildlife or fish movement are proposed.

Mitigation Measures

Since no significant direct or indirect impacts to wildlife or fisheries would occur at the Otay River Floodplain Site, Pond 15 Site, or the project features, no mitigation measures would be required under Alternative A.

4.3.3.2 Alternative B

Under Alternative B, the Otay River Floodplain Site would be converted from upland habitat to approximately 29.61 acres of coastal wetland habitat, and 3.90 acres of upland habitat at the Pond 15 Site would be converted from open water habitat that has no tidal influence or connection to the rest of San Diego Bay (part of the solar salt pond facility) to approximately 84.65 acres of tidally influenced coastal wetland habitat and 6.26 acres of upland habitat.

Wildlife

The American Bird Conservancy has designated the South San Diego Bay Unit as a Globally Important Bird Area due to the presence of globally significant populations of nesting gull-billed terns and continentally significant populations of surf scoter (*Melanitta perspicillata*), Caspian tern, and western snowy plover. The entire southern end of San Diego Bay has been recognized as a Western Hemisphere Shorebird Reserve Network Site.

Fisheries

The fisheries of south San Diego Bay are recognized as a valuable resource, and the intertidal salt marsh, intertidal mudflat, and subtidal habitat are regionally valuable habitats targeted for restoration/creation in the Southern California Bight (USFWS 2006). The extensive shallow-water habitat and eelgrass (*Zostera* spp.) beds of the south San Diego Bay provide important habitat for a variety of fish, including midwater schooling fish such as northern anchovy (*Engraulis mordax*), slough anchovy (*Anchoa delicatissima*), and topsmelt (*Atherinops affinis*). These species, in turn, represent a major forage resource for predatory fish and avian species. The south end of San Diego Bay also functions as an important nursery area for juvenile California halibut and young spotted bass (*Micropterus punctulatus*) and barred sand bass (*Paralabrax nebulifer*).

San Diego Bay has been designated as essential fish habitat for various species managed under the Pacific Coast Groundfish Plan and Coastal Pelagic Species Fishery Management Plan (as discussed in USFWS 2006). In addition, it contains both “estuary” and “seagrass” (i.e., eelgrass) habitat, which have been identified as habitat areas of particular concern for species in the Pacific Coast Groundfish Fishery Management Plan (as discussed in USFWS 2006). Habitat areas of particular concern are subsets of essential fish habitat that are rare, particularly susceptible to human-induced degradation, especially ecologically important, or located in an environmentally stressed area. Habitat areas of particular concern are used to focus conservation efforts.

Direct Impacts

Otay River Floodplain Site

Wildlife

Currently, available habitat for wintering waterfowl and migrant and wintering shorebirds is limited on the Otay River Floodplain Site. Small patches of disturbed wetland communities, including southern coastal salt marsh, remain on approximately 1.26 acres of the site, and *Isocoma* scrub, an upland habitat, provides foraging and nesting areas for a variety of upland species. The species observed in this upland area are generally common species tolerant of or capable of taking advantage of areas dominated by shrub cover and non-native plant species.

The proposed restoration activities at the Otay River Floodplain Site would result in direct impacts to available habitat for wintering waterfowl, migrant and wintering shorebirds, and other waterbirds, and the permanent loss of upland habitat that supports a variety of birds, such as raptors and songbirds, and various species of mammals. During biological surveys in 2011, 79 species of birds were observed, including frequent observations of house finch (*Carpodacus mexicanus*) and lesser goldfinch (*Spinus tristis*), several swallow species foraging over the site, and coastal shorebirds and gulls observed flying over the site. Four mammal species were also observed in 2011 on the site.

A number of special-status wildlife species were detected on the Otay River Floodplain Site. These species are discussed in Section 4.3.2.

The proposed restoration activities at the Otay River Floodplain Site would represent a direct loss of 18.40 acres of potential upland foraging and nesting habitat and 6.43 acres of conversion of wetland foraging and nesting habitat. This loss would displace some existing species (e.g., upland bird species, reptiles, mammals), while expanding the available habitat for other species (e.g., migratory shorebirds and seabirds, waterbirds, fish, and benthic invertebrates). The loss of upland habitat in this area is offset by the proposal to establish native upland habitat to the east of the restoration site, where the existing non-native vegetation provides limited habitat quality.

As a result, Alternative B would have no significant direct impact on the wildlife species currently supported in the Otay River Floodplain Site, and no mitigation is required.

Construction Methods, as addressed in Section 2.3.2.4, would result in avoidance of impacts to listed and special-status species as well as other wildlife. Nesting season avoidance Construction Methods are specified in Section 4.3.2.2.

As a result, implementation of Alternative B would not result in any significant direct impacts to wildlife present on or adjacent to the Otay River Floodplain Site, and no mitigation is required.

Fisheries

The proposed restoration activities at the Otay River Floodplain Site could result in direct impacts to fish when the restored area is open to tidal action, During the period when the Otay River Floodplain Site is being breached, there is potential for sediment to travel into the Bay or for an increase in turbidity to occur in the vicinity of the breach site. Based on the Service's experience with breaching levees to restore tidal influence to the western salt ponds in the Bay, a substantial increase in turbidity and/or sedimentation would not be expected during or following the opening of the site. The potential for direct impacts to fish as a result of implementing Alternative B would be mitigated through adherence to MM-HYD-1. No other significant direct impacts to fisheries are anticipated.

Pond 15 Site

Wildlife

Currently, the Pond 15 Site provides foraging, loafing, and rafting habitat for wintering waterfowl, migratory and wintering shorebirds, migratory seabirds, and other year-round waterbirds and summer visitors. Although the number of birds on the salt pond can be high, species richness is low, especially compared to the adjacent San Diego Bay where species richness is very high, as different species forage in response to the tidal cycles and the alternating of exposure and inundation of mudflats. Habitat in the project site consists of mostly open hypersaline water, with a narrow upland perimeter formed by the levee system.

Direct permanent impacts would result from the conversion of the Pond 15 Site from an enclosed water habitat to a tidally influenced habitat. This conversion is likely to result in a change in the numbers and diversity of birds using the pond, but would not result in the elimination of this habitat in the San Diego Bay NWR. A number of salt ponds would still be available to support species such as red-necked phalarope (*Phalaropus lobatus*), Wilson's phalarope (*P. tricolor*), black-necked stilt (*Himantopus mexicanus*), and American avocet (*Recurvirostra americana*) that frequent the primary salt ponds. During construction, the proposed action would result in the temporary (3- to 7-year) loss of approximately 90.90 acres of foraging and nesting habitat in Pond 15 as the water is transferred into other ponds in the system and the pond is filled to achieve elevations that would ultimately support a range of subtidal and intertidal habitats. Other areas of the South Bay Salt Works would be available to support the migratory and resident bird species that use the Pond 15 Site for foraging, rafting, and loafing.

Implementation of Alternative B would temporarily eliminate the habitat value of the Pond 15 Site and permanently result in a conversion of habitat within the site by replacing open water habitat with tidally influenced habitat. The temporary impacts are not considered significant because there is adequate habitat available in the South Bay Salt Works to accommodate the birds currently using the Pond 15 Site, and all work would be performed outside the breeding season. In addition, although some species of birds would be permanently displaced, other ponds in the salt pond system would continue to provide foraging, loafing, and rafting opportunities to support these species. Once the Pond 15 Site is connected to the Bay and the area is subject to tidal influence, the habitat quality would increase and new foraging opportunities would develop over time, providing a net benefit to a wide range of bird species.

Similar to the Otay River Floodplain Site, restoration on the Pond 15 Site could result in direct impacts to nesting birds on and adjacent to the site. However, Construction Methods, as addressed in Section 2.3.2.4, would result in avoidance of these impacts. Nesting season avoidance Construction Methods are specified in Section 4.3.2.2.

As a result, implementation of Alternative B would not result in any significant direct impacts to nesting birds in or adjacent to the Pond 15 Site, and no mitigation would be required.

Fisheries

Although San Diego Bay is identified as a habitat area of particular concern for estuaries and Pacific coast groundfish, the proposed restoration would provide more fish habitat once the levee on the Pond 15 Site has been breached. Therefore, no potential long-term direct impacts are expected.

The restored pond would also provide habitat to support fish and other marine organisms that are not currently supported in the Pond 15 Site. As a result, implementation of Alternative B would provide a net long-term benefit to fish at the Pond 15 Site.

During the period when the levee for Pond 15 is being breached, there is a potential for sediment to travel into the Bay or for an increase in turbidity to occur in the vicinity of the breach site. Based on the Service's experience with breaching levees to restore tidal influence to the western salt ponds in the Bay, a substantial increase in turbidity and/or sedimentation would not be expected during or following the breaching of Pond 15 (Nordby, pers. comm. 2016). However, any potential for direct impacts to fish as a result of implementing Alternative B would be mitigated through adherence to MM-HYD-1.

An eelgrass survey conducted in San Diego Bay in 2014 indicates that eelgrass occurs along the southern edge of the Chula Vista Wildlife Reserve, about 850 feet to the west of the proposed breach site in Pond 15 (NAVFAC and Port 2014; Figure 3.3-8). Because the location of eelgrass

habitat in the Bay fluctuates naturally on a seasonal and annual basis, and the closure of the South Bay Power Plant has improved conditions for eelgrass in the vicinity of Pond 15, the eelgrass distribution in this area may have changed since 2014. Therefore, to ensure that any adverse impacts to eelgrass habitat are adequately addressed pre- and post-construction, eelgrass surveys would be conducted in the vicinity of the proposed breach site (MM-BIO-11). Surveys will be conducted in accordance with the Southern California Eelgrass Mitigation Policy, which offers specific guidelines for appropriate responses and mitigation measures for activities that threaten eelgrass vegetated habitats.

San Diego Unified Port District Lands

Potential impacts to wildlife and fisheries for the Port lands are the same as described for the Pond 15 Site.

Project Features

Similar to the Otay River Floodplain Site, available habitat in the project features for wintering waterfowl and migrant and wintering shorebirds is limited. Most of the project features occur in disturbed habitat.

Similar to the Otay River Floodplain Site and per implementation of the Construction Methods outlined in Section 2.3.2.4, direct impacts to wildlife and fish from the project features would be less than significant.

Similar to the Otay River Floodplain Site, restoration on any of the 14 project features described in Chapter 2 could result in direct impacts to nesting birds on and adjacent to the various project features. However, Construction Methods, as addressed in Section 2.3.2.4, would result in avoidance of these impacts. Nesting season avoidance Construction Methods are specified in Section 4.3.2.2.

As a result, implementation of the project features associated with Alternative B would not result in any significant direct impacts to wildlife or fisheries, and no mitigation would be required.

Indirect Impacts

Otay River Floodplain Site

Wildlife

Temporary indirect impacts related to disturbance from construction noise and activity would affect wildlife use, including birds and terrestrial wildlife, in habitat areas adjacent to the Otay River Floodplain Site. This disturbance could occur Monday through Friday from 7 a.m. to 6 p.m.

from September to February for 3 to 7 years. Because noise associated with construction would only occur outside the breeding season, no impacts would occur. In addition, the loss of upland habitat in this area is offset by the proposal to establish native upland vegetation to the east of the restoration site, where the existing non-native vegetation provides limited habitat quality.

Similar to the direct impacts for the Otay River Floodplain Site, indirect impacts to nesting birds could result from the proposed restoration activities at the Otay River Floodplain Site. However, Construction Methods, as addressed in Section 2.3.2.4, would result in avoidance of these impacts. Nesting season avoidance Construction Methods are specified in Section 4.3.2.2.

As a result, implementation of Alternative B would not result in any significant indirect impacts to nesting birds in or adjacent to the Otay River Floodplain Site, and no mitigation is required.

Fisheries

The proposed restoration activities at the Otay River Floodplain Site could result in indirect impacts to fish when the restored area is open to tidal action, During the period when the Otay River Floodplain Site is being breached, there is a potential for sediment to travel into the Bay or for an increase in turbidity to occur in the vicinity of the breach site. Based on the Service's experience with breaching levees to restore tidal influence to the western salt ponds in the Bay, a substantial increase in turbidity and/or sedimentation would not be expected during or following the opening of the site. The potential for indirect impacts to fish as a result of implementing Alternative B would be mitigated through adherence to MM-HYD-1. No other significant indirect impacts to fisheries are anticipated.

Pond 15 Site

Wildlife

Temporary indirect impacts related to disturbance from construction noise and activity would affect bird use in habitat areas adjacent to the Pond 15 Site. This disturbance could occur Monday through Friday from 7 a.m. to 6 p.m. from September to February for 3 to 7 years. Areas that could be affected include the Palomar channel; portions of Ponds 13, 14, 24, and 25; and the mudflats and open water areas of San Diego Bay situated along the edges of Pond 15. Because noise associated with construction would only occur outside the breeding season, no impacts would occur.

Similar to the direct impact analysis for the Pond 15 Site, indirect impacts to nesting birds could result from the proposed restoration activities at the Pond 15 Site. However, Construction Methods, as addressed in Section 2.3.2.4, would result in avoidance of these impacts. Nesting season avoidance Construction Methods are specified in Section 4.3.2.2.

As a result, implementation of Alternative B would not result in any significant indirect impacts to nesting birds in and adjacent to the Pond 15 Site, and no mitigation would be required.

The potential for indirect impacts to eelgrass as a result of implementing Alternative B would be mitigated through adherence to MM-BIO-11.

Fisheries

The proposed restoration activities at the Pond 15 Site could result in indirect impacts to fish when the restored area is open to tidal action. During the period when the Site is being breached, there is a potential for sediment to travel into the Bay or for an increase in turbidity to occur in the vicinity of the breach site. Based on the Service's experience with breaching levees to restore tidal influence to the western salt ponds in the Bay, a substantial increase in turbidity and/or sedimentation would not be expected during or following the opening of the site. The potential for indirect impacts to fish as a result of implementing Alternative B would be mitigated through adherence to MM-HYD-1. No other significant indirect impacts to fisheries are anticipated.

San Diego Unified Port District Lands

Potential indirect impacts to wildlife and fisheries for the Port lands are the same as described for the Pond 15 Site.

Project Features

Temporary indirect impacts related to disturbance from construction noise and activity would affect bird use in habitat areas adjacent to the project site. This disturbance could occur Monday through Friday from 7 a.m. to 6 p.m. from September to February for 3 to 7 years. Because noise associated with construction would only occur outside the breeding season, no impacts would occur.

Similar to the direct impacts of the project features, indirect impacts to nesting birds could result from the proposed restoration activities at the project features. However, Construction Methods, as addressed in Section 2.3.2.4, would result in avoidance of these impacts. Nesting season avoidance Construction Methods are specified in Section 4.3.2.2.

As a result, implementation of Alternative B would not result in any significant indirect impacts to nesting birds or other wildlife in or adjacent to the project features, and no mitigation would be required.

The proposed project features are implemented as part of the restoration activities. Impacts on fish could result when rock is added to the bank along the channel and when protection for the bikeway bridge is implemented within the channel. With implementation of the project

Construction Methods outlined in Section 2.3.2.4 and MM-HYD-1 and MM-BIO-11, indirect impacts to wildlife and fish from project features would be less than significant.

Mitigation Measures

Implementation of Alternative B would create and enhance natural coastal wetlands that would support numerous fish and wildlife species that occur or potentially occur on the project site and in the San Diego Bay NWR. The conversion of wildlife species habitat at the Otay River Floodplain Site, Pond 15 Site, and project features would be more than offset by the restoration of approximately 124.41 acres of tidally influenced and upland transitional habitat in this portion of the San Diego Bay NWR. The benefits of restoration, which would be accomplished through a combination of active revegetation and natural recruitment, would include improved biological productivity in the Otay River Floodplain Site and Pond 15 Site to support a range of fish and wildlife species, while also restoring historical wetland values at both locations. To avoid direct or indirect impacts to fisheries, including eelgrass, MM-GEO-1, MM-GEO-2, MM-HYD-1, and MM-BIO-11 would be implemented under Alternative B.

MM-BIO-11 Eelgrass. Eelgrass (*Zostera* spp.) surveys, consistent with the requirements outlined in the 2014 California Eelgrass Mitigation Policy (CEMP), shall be conducted to detect any impacts to eelgrass in the vicinity of the proposed action as a result of breaching Pond 15 and/or opening the proposed restoration area on the Otay River floodplain to tidal action. Pre-breaching surveys for Pond 15 shall be conducted in San Diego Bay from the proposed opening of Pond 15 to the southeast corner of the Chula Vista Wildlife Reserve and at an appropriate reference site. Pre-opening surveys for the proposed restoration area on the Otay River floodplain shall be conducted in the Otay River channel between the opening of Pond 10 and the outlet in Pond 11; in the tidal channels of Ponds 10 and 11; and at an appropriate reference site. The same surveys shall be conducted within 30 days of breaching Pond 15 and 30 days of opening the Otay River floodplain tidal basin to the Bay.

If impacts to eelgrass from implementation of the proposed action are identified, mitigation shall be provided in compliance with the CEMP. The Service shall develop an Eelgrass Mitigation Plan that includes a description of the impact, identification of a mitigation site that provides mitigation at the appropriate ratio, identification of a suitable local reference site, success criteria for the mitigation site and a monitoring plan for the mitigation and reference sites. Monitoring reports shall be filed with the resource agencies and the Executive Director of the California Coastal Commission.

4.3.3.3 Alternative C

Under Alternative C, the Otay River Floodplain Site would be recontoured to create a subtidal channel, intertidal mudflats (including frequently flooded and frequently exposed zones), and intertidal coastal salt marsh mudflat (including low, mid, and high marsh zones). The Pond 15 Site would also be recontoured to create similar but deeper subtidal and marsh zones. As discussed in Section 2.3 of this EIS, 33.51 acres of wetlands and transitional upland habitat would be planted at the Otay River Floodplain Site by 2020. Approximately 90.90 acres of wetlands and transitional upland habitat would be planted at the Pond 15 Site by 2020. The restored areas would contribute to the south San Diego Bay ecosystem by providing additional terrestrial habitat for wetland-dependent wildlife species and important shallow-water habitat for a variety of fish that represent a major forage resource for predatory fish and avian species.

Direct and Indirect Impacts

Otay River Floodplain Site

The potential direct and indirect impacts to fisheries and wildlife, including wintering waterfowl and migrant and wintering shorebirds, from implementation of Alternative C in the Otay River Floodplain Site would be the same as those described for Alternative B.

Pond 15 Site

The potential direct and indirect impacts to fisheries and wildlife, including wintering waterfowl and migrant and wintering shorebirds, from implementation of Alternative C in the Pond 15 Site would be the same as those described for Alternative B.

San Diego Unified Port District Lands

Potential direct and indirect impacts to fisheries and wildlife from implementation of Alternative C for the Port lands are the same as described for Alternative B.

Project Features

The potential direct and indirect impacts to fisheries and wildlife, including wintering waterfowl and migrant and wintering shorebirds, from implementation of Alternative C in the project features would be the same as those described for Alternative B.

Mitigation Measures

Mitigation requirements for Alternative C would be the same as for those described for Alternative B.

4.4 CULTURAL RESOURCES

Section 106 (16 U.S.C. 470f) of the National Historic Preservation Act 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 as follows:

- Identify and evaluate historic properties.
- Assess effects of the project on historic properties (if no adverse effects are identified, no additional steps are necessary).
- Resolve any adverse effects of the project on historic properties in consultation with the State Historic Preservation Office (SHPO)/Tribal Historic Preservation Officer and other interested parties, resulting in a mitigation strategy.
- Implement mitigation if necessary.

Prior to evaluating the potential effects of a proposed action, it is necessary to conduct a survey of the area of potential effects (APE). This is followed by determining whether any resources located within the APE have been identified as eligible for inclusion in the National Register of Historic Places (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. The APE is influenced by the scale and nature of a 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 effect to cultural resources would be considered adverse 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 a proposed action's elements that would be out of character with the property or its setting. In addition, Title 36 of the Code of Federal Regulations, Part 800, defines effects and adverse effects on historic resources as follows:

> (1) *Criteria of adverse effect*. 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 National Register 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 National Register. 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 (36 CFR, Section 800.5(a)(1)).

According to Section 800.5(a)(2), examples of potentially significant impacts on historic properties include the following:

(i) Physical destruction, damage, or alteration of all or part of the property;

(ii) Alteration of a property, including restoration, rehabilitation, repair, maintenance, stabilization, hazardous material remediation and provision of handicapped access, that is not consistent with the Secretary's Standards for the Treatment of Historic Properties (36 CFR part 68) and applicable guidelines;

(iii) Removal of the property from its historic location;

(iv) Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;

(v) Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;

(vi) Neglect of a property which causes its deterioration, except where such neglect and deterioration are recognized qualities of a property of religious and cultural significance to an Indian tribe or Native Hawaiian organization; and

(vii) Transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance (36 CFR, Section 800.5(a)(2)).

4.4.1 Alternative A

Six cultural resources were identified within the APE for the Otay River Estuary Restoration Project (proposed action), consisting of four prehistoric archaeological sites (SDI-19,712, SDI-20,686, SDI-7455, and SDI-20,765) and two historic period sites (Salt Works-P-37-026582 and the Coronado Belt Line-SDI-13,073). SDI-7455 and Salt Works-P-37-026582 are considered eligible for listing in the NRHP.

Under Alternative A, no excavation within the Otay River Floodplain Site or alterations to the existing salt ponds within the San Diego Bay National Wildlife Refuge would occur. Instead, the portion of the project site located within the Otay River floodplain would continue to receive minimal management (e.g., mowing of weeds east of Nestor Creek, occasional site visits to

conduct wildlife and habitat monitoring west of Nestor Creek). Pond 15 and the surrounding levees would continue to support the existing solar salt operation on the site. These activities are not expected to affect any resource listed in or eligible for listing in the NRHP, or physically damage or alter, isolate from the context associated with its listing, or affect a cultural resource. Further, management within the project site under Alternative A would be conducted in accordance with the requirements of 36 CFR Sections 800.5(a)(1) and 800.5(a)(2). Therefore, no impacts to cultural resources would occur.

Mitigation Measures

No effects to cultural resources would occur; therefore, no mitigation measures are required.

4.4.2 Alternative B

Alternative B would include restoration of native wetland habitat by excavating portions of the Otay River floodplain, including Pond 20a, and using much of the excavated fill to raise the elevations in Pond 15 to levels appropriate for supporting salt marsh vegetation. This alternative would also include breaching Pond 15 to restore tidal exchange within the pond. The levees of several adjacent ponds would also be altered to support tidal wetland restoration in Pond 15.

P-37-026582 (Western Salt Company Salt Works)

As described in Section 3.4, in 2002 the SHPO determined that the historic-period Western Salt Company Salt Works facility was eligible for the NRHP as a historic district under Criteria A and C, as defined by 36 CFR Part 60.4. The proposed restoration of the Otay River Floodplain Site and the Pond 15 Site under Alternative B, as well as associated project features depicted in Figure 2-1a in Chapter 2, including raising the levee between Ponds 22 and 23, would affect this historic-period resource.

In 2001, the U.S. Fish and Wildlife Service (Service), in recognition of the significance of this resource and the need to address future proposals to modify the salt pond levees, entered into a Memorandum of Agreement (MOA) with the SHPO regarding restoration of the Western Salt Company Salt Works Ponds 10, 10a, and 11. The MOA included two stipulations for addressing effects to the NRHP-eligible resource: (A) recordation of historic properties to Historic American Landscape Survey (HALS) standards and preparation of a HALS written report and (B) interpretation of the solar salt industry at the South San Diego Bay Unit. In accordance with stipulation A, the Service commissioned a HALS in 2001 (NPS 2001). The HALS was completed as mitigation for earthen levee breaches related to restoration of coastal salt marsh, and was intended to act as mitigation for adverse effects to all earthen levees associated with the resource. All required stipulations were completed, meeting the terms of the MOA, and the MOA was subsequently terminated in 2013 (Appendix K2).

To restore tidal exchange and support coastal wetland restoration in Pond 15, Alternative B would include breaching the northern earthen levee of Pond 15 and reconnecting the pond to San Diego Bay. In addition, to ensure that tidal flows do not breach the remaining levees around Pond 15, these levees would be reinforced with fill material as part of the salt marsh restoration process. The locations and brief descriptions of other permanent and temporary modifications to levees within the salt works are presented in Chapter 2 and shown in Figure 2-1a. The proposed action would include removing the northern levee of Pond 20a to accommodate restoration of historic salt marsh habitat; creating a new levee at the southern edge of restored habitat to protect the remaining portion of the historic Pond 20, owned by the Port of San Diego, from tidal inundation; raising the elevation of the levee between Ponds 22 and 23 to address changes in flood flows as a result of the proposed restoration; and modifying the levees in Ponds 13 and 14 to provide a new connection to the remaining solar salt ponds and ensure that continued use of these ponds remains part of the existing solar salt evaporation process. These activities would impact this resource; however, the impacts are not considered significant because the Service-commissioned HALS serves as mitigation for all such activities. Nevertheless, additional photodocumentation and resource record updates have been completed for Pond 15, and additional interpretation of the historic salt works would be developed as described under Mitigation Measure (MM) CUL-1 (see Mitigation Measures section at the end of this section). Implementation of MM-CUL-1 would ensure that impacts to this resource would be less than significant.

SDI-7455

Dudek's evaluation concluded that the deposits associated with this resource are most likely related to the ethnohistoric village of La Punta, identified in 1782, and that these deposits are eligible for the NRHP under Criterion A (Significant Historical Events) and Criterion D (Scientific Data Potential) (Appendix K). Therefore, any earth movement within the deposits related to Alternative B would constitute a significant impact. Alternative B would not affect any portion of this resource because it is located outside of the Otay River Floodplain Site, outside of the Pond 15 Site, and outside the footprint of any project features (Appendix K). Therefore, no effects to this resource from implementation of Alternative B are anticipated.

SDI-13,073 (Coronado Belt Line Railroad)

This historic-period resource is located just to the north and outside the boundaries of the Otay River Floodplain Site. The historic tracks are also present along Bay Boulevard east of the Pond 15 Site. This resource was determined not eligible for listing in the NRHP (USFWS 2009); however, the remaining track is considered historically important to the local community. The resource itself would not be modified following implementation of Alternative B, and its setting, location, and integrity would not be altered in any way. Although the resource would not be

modified under Alternative B, the existing tracks would be crossed by construction vehicles to gain access to the Pond 15 Site; therefore, MM-CUL-2 is provided (below). MM-CUL-2 would include installation of temporary ballasts and/or protective track coverings to protect the rails in place at the point where construction vehicles would cross the tracks to access the Pond 15 Site. Following implementation of MM-CUL-2, no effects to this site would occur.

SDI-19,712

This small prehistoric artifact scatter is located within the Otay River Floodplain Site in the area proposed for grading and habitat restoration under Alternative B. During geotechnical exploration and archaeological testing, no substantial cultural deposits were identified (Dudek 2012). As a result of the evaluation performed by Dudek, the site was recommended as not eligible for listing in the NRHP under any of the criteria (Appendix K). Therefore, impacts to this resource as a result of implementation of Alternative B would be less than significant.

SDI-20,686

This prehistoric resource is a lithic scatter. The general area surrounding and including this resource has been subject to a number of past disturbances, including agricultural use. As addressed in Section 3.4, this resource is not considered eligible for NRHP listing under any of the associated significance criteria. Therefore, impacts to this resource as a result of implementation of Alternative B would be less than significant.

SDI-20,765

Located east of the Otay River Floodplain Site within the area proposed for revegetation east of Nestor Creek, this resource consists of a small scatter of prehistoric artifacts situated near and on top of chunks of asphalt and concrete. It was determined that no primary archaeological deposits exist in the vicinity (Appendix K). As such, the resource is considered not eligible for NRHP listing under any of the associated significance criteria, and impacts to this resource as a result of implementation of Alternative B would be less than significant.

Unidentified/Undiscovered Cultural Resources and Human Remains

The proposed action would include grading and earthmoving activities that could result in potential impacts to undiscovered cultural resources. To reduce unanticipated impacts to cultural resources, MM-CUL-3 and MM-CUL-4 are provided (see Mitigation Measures). Implementation of these measures would reduce impacts to undiscovered cultural resources to a level that is less than significant.

Additionally, because the proposed action would include grading and earthmoving activities, the potential exists to encounter undiscovered human remains. To reduce potentially significant impacts associated with the discovery of human remains, MM-CUL-5 is provided. Implementation of MM-CUL-5 would reduce unanticipated impacts to undiscovered human remains to less than significant.

Mitigation Measures

The following mitigation measures have been incorporated into the scope of the proposed action to ensure that potential effects to cultural resources would be avoided:

MM-CUL-1 Prior to commencement of any project excavation, a Memorandum of Agreement between the U.S. Fish and Wildlife Service (Service) and the State Historic Preservation Office (SHPO) shall be signed that requires the following stipulations to be completed within 1 year of the commencement of project excavation: (1) in addition to the existing Historic American Landscape Survey (HALS) documentation, entitled *Cultural Resources Evaluation for the U.S. Fish and Wildlife Service Otay River Estuary Restoration Project, Otay Mesa, San Diego County, California* (Appendix K), supplemental photodocumentation will be conducted for Ponds 13, 14, and 15 and the northern portion of Pond 20A; (2) oral history research will be conducted to document the history of the salt works and its ultimate inclusion in the San Diego Bay National Wildlife Refuge (NWR), as well as the 100-year-plus salt-making process at this site; (3) an overview of the salt works history will be posted on the NWR website; and (4) an interpretive panel that expands upon the interpretation already developed to inform visitors of the historic significance of the salt works will be designed, fabricated, and installed on the NWR.

MM-CUL-2 The Service shall ensure that prior to the commencement of construction activities at either the Otay River Floodplain Site or the Pond 15 Site, the construction contractor has implemented protective measures such as temporary ballasts, wood beams, or other protective crossing mechanisms to protect the historic rail tracks located along Bay Boulevard at the construction access point to the Pond 15 Site. These temporary protective measures shall be periodically inspected to ensure their integrity and shall remain in place until all construction activity has ceased within the Pond 15 Site.

MM-CUL-3 A qualified archaeologist meeting the Secretary of the Interior's Standards and Guidelines: Professional Qualifications Standards and a Kumeyaay cultural monitor shall monitor all grading and subsurface disturbance within the project's

area of potential effect. If any cultural resources are discovered during excavation, all earthwork in the vicinity shall be halted and the Service's Regional Historic Preservation Officer shall be immediately contacted to review the materials and recommend a treatment that is consistent with applicable laws and policies. The treatment plan would likely require the boundaries of the site to be defined before excavation can be reinitiated in the vicinity of the discovery. The site shall be recorded and evaluated for eligibility for listing in the National Register of Historic Places (NRHP). Once this work is completed, additional measures may be required, depending on the results of the eligibility determination. If any site is encountered that is determined to be eligible for listing in the NRHP, the Service shall consult with the SHPO, federally recognized Tribes, and interested parties, and additional measures may be required.

The archaeological and Kumeyaay cultural monitors shall provide a monitoring report to the Service's Regional Historic Preservation Officer and the San Diego Bay NWR Manager describing the activities and findings of the monitoring effort within 30 days of the completion of all monitoring activity. Summaries of all actions taken related to the discovery of cultural resources during site excavation shall be provided to the Service's Regional Historic Preservation Officer and the NWR Manager within 15 days of completion of the action.

MM-CUL-4 All archaeological resources encountered on the San Diego Bay NWR shall be handled in accordance with federal regulations. With respect to artifacts collected on the San Diego Bay NWR, either as part of site investigations and recovery or inadvertent discovery during excavation, the Service will ensure proper care of Federally owned and administered archaeological collections, including ensuring that prehistoric and historic artifacts and associated records are deposited in an institution with adequate long-term curatorial capabilities that can provide professional, systematic, and accountable curatorial services on a long-term basis.

MM-CUL-5 In the event of the inadvertent discovery of human remains, the Service's Regional Historic Preservation Officer and the San Diego County Coroner shall be immediately contacted per the Native American Graves Protection and Repatriation Act (NAGPRA) Section (3)(d)(1). All earthwork in the vicinity of the discovery shall be halted and the discovery site shall be secured from further disturbance. If the remains are determined to be Native American, all required NAGPRA inadvertent discovery procedures, including, but not limited to, initiating consultation with the Kumeyaay Cultural Repatriation Committee, developing a plan of action, and repatriating any NAGPRA cultural items (i.e., funerary objects, sacred objects, objects of cultural patrimony) and/or human remains, shall be followed.

Implementation of these measures would avoid effects to cultural resources under Alternative B.

4.4.3 Alternative C

Under Alternative C, the APE would include the same areas as described for Alternative B; however, excavation within the Otay River Floodplain Site footprint would be deeper to support subtidal habitat. Specifically, this alternative would require excavation of 370,000 cubic yards of fill material in the Otay River Floodplain Site, approximately 50,000 cubic yards more than for Alternative B. Because the APE for Alternative C would be the same as that described for Alternative B, the analysis of the potential adverse effects to cultural resources under Alternative C would be essentially the same as that described for Alternative B.

Mitigation Measures

As described under Alternative B, MM-CUL-1 through MM-CUL-5 would be implemented under Alternative C; therefore, potential impacts to cultural resources from implementation of Alternative C would be less than significant.

4.5 SOCIAL AND ECONOMIC ENVIRONMENT

4.5.1 Land Use

This section analyzes the potential land use conflicts between the proposals presented in each alternative and the existing and planned land uses in the immediate vicinity of the two project sites for the Otay River Estuary Restoration Project (ORERP, or proposed action). The analysis also addresses consistency with coastal management policies, including the California Coastal Act.

Significance Threshold: Impacts to land use would be considered significant if substantial changes in use or intensity of use could occur on the project site that would affect adjacent or nearby properties. A significant impact to land use would also occur if an action or the activities proposed in association with the action would be inconsistent with applicable land use regulations (e.g., Coastal Zone Management Act of 1972, as amended; California Coastal Act).

4.5.1.1 Alternative A

Under Alternative A, the no action alternative, there would be no change to the existing land use conditions at either portion of the project site. Habitat and wildlife management would remain unchanged, as would operations at the salt works. Therefore, this alternative would not result in any potential land use conflicts to existing, permitted, or planned uses on or near the San Diego Bay National Wildlife Refuge (NWR) and other adjacent areas.

Mitigation Measures

No significant impacts are anticipated; therefore, no mitigation measures are required.

4.5.1.2 Alternative B

As indicated in Table 4.5-1, tidal restoration of the Otay River Floodplain Site and the Pond 15 Site, as proposed under Alternative B, is consistent with goals and recommendations included within the *San Diego Bay NWR Comprehensive Conservation Plan* (USFWS 2006). In addition, the proposed restoration under this alternative is also consistent with the resource goals and objectives of the Multiple Species Conservation Program, which designates the project site as riparian/wetlands. Specifically, the overarching goal of the Multiple Species Conservation Program is to maintain and enhance biological diversity in the region and conserve viable populations of endangered, threatened, and key sensitive species and their habitats, thereby preventing local extirpation and ultimate extinction, and minimizing the need for future listings, while enabling economic growth in the region (City of San Diego 1997). Under this alternative, each component of this overarching goal would be achieved, as outlined in further detail in Section 4.3, Biological Resources, of this Environmental Impact Statement (EIS).

Table 4.5-1
Consistency with San Diego Bay NWR Comprehensive Conservation Plan

South San Diego Bay Unit Goals	Goal/Recommendation	Alternative B	Alternative C
Goal 1	Protect, manage, enhance, and restore open water, coastal wetlands, and native upland habitat to benefit the native fish, wildlife, and plant species supported within the South San Diego Bay Unit.	This alternative restores a portion of the South San Diego Bay Unit to coastal wetlands, which is consistent with this goal.	This alternative restores a portion of the South San Diego Bay Unit to coastal wetlands, which is consistent with this goal.
Goal 2	Support recovery and protection efforts for the Federally and State listed threatened and endangered species and species of concern that occur within the South San Diego Bay Unit.	This alternative restores a portion of the South San Diego Bay Unit to coastal wetlands that could provide habitat for several threatened and endangered species and species of concern, which is consistent with this goal.	This alternative restores a portion of the South San Diego Bay Unit to coastal wetlands that could provide habitat for several threatened and endangered species and species of concern, which is consistent with this goal.
Goal 3	Provide high-quality foraging, resting, and breeding habitat for colonial nesting seabirds, migratory shorebirds, and waterfowl and saltmarsh-dependent species.	Although this alternative would replace habitat that currently provides foraging opportunities for some species, the restored habitat would provide high-quality wetland habitat to support a greater diversity of species, as well as providing nesting opportunities for seabirds and some shorebirds. Open water habitat would continue to be present in adjacent ponds. Therefore, Alternative B would be consistent with this goal.	Although this alternative would replace habitat that currently provides foraging opportunities for some species, the restored habitat would provide high-quality wetland habitat to support a greater diversity of species, as well as providing nesting opportunities for seabirds and some shorebirds. Open water habitat would continue to be present in adjacent ponds. Therefore, Alternative C would be consistent with this goal.
Goal 4	Provide opportunities for compatible wildlife-dependent recreation and interpretation that foster public appreciation of the unique natural and cultural heritage of South San Diego Bay.	Restoration under this alternative would not hinder the ability of the San Diego Bay NWR to achieve this goal. The restored habitats under this alternative would provide the San Diego Bay NWR with additional opportunities for interpreting wetland species. This alternative would be consistent with this goal.	Restoration under this alternative would not hinder the San Diego Bay NWR's ability to achieve this goal. The restored habitats under this alternative would provide the San Diego Bay NWR with additional opportunities for interpreting wetland species. This alternative would be consistent with this goal.

NWR = National Wildlife Refuge.

Section 307(c)(1) of the Coastal Zone Management Act, as amended, requires that Federal agency activities that impact any land or water use or natural resource of the coastal zone be consistent with the affected State's coastal management program, in this case the California Coastal Management Program, to the "maximum extent practicable." Section 930.32 of the National Oceanic and Atmospheric Administration's regulations implementing the Coastal

Zone Management Act (15 CFR, Part 930) defines "consistent to the maximum extent practicable" as follows:

> The term "consistent to the maximum extent practicable" means fully consistent with the enforceable policies of management programs unless full consistency is prohibited by existing law applicable to the Federal agency (15 CFR 930.32(a)(1)).

Based on a detailed analysis of the consistency of the actions and proposed outcomes of implementing Alternative B with the principal component of the California Coastal Management Program, namely the planning and management policies presented in Chapter 3 of the California Coastal Act, as presented in Appendix N of this EIS, the implementation of Alternative B would be consistent to the maximum extent practicable with the policies of the California Coastal Act.

Additionally, a 0.79-acre portion of the Pond 15 Site area would be located within the Port of San Diego (Port) jurisdiction, as shown on Figure 2-1b. This 0.79-acre area is designated as Wetlands in the Port Master Plan (Port 2015). In regards to Wetland land uses, the Port Master Plan states, "development shall be limited to restoration, nature study or similar resource-dependent activities. Dredging and spoils disposal shall be planned and carried out to avoid significant disruption to marine and wildlife habitats and water circulation. Any diking, filling or dredging occurring in these areas shall maintain or enhance function capacity of the wetlands" (Port 2015). The Pond 15 Site inlet/outlet improvements would be conducted in support of the project's overall wetland creation objectives and to enhance the wetlands functional use by terrestrial and aquatic species. Mitigation measures MM-BIO-2, MM-BIO-5, MM-BIO-7, MM-BIO-9 and MM-BIO-10 would be implemented to mitigate potential impacts to sensitive species and habitat that may occur within the Pond 15 levee breach inlet/outlet area to a level that is less than significant. Therefore, implementation of Alternative B would not result in a change in designation to this land use or conflict with the goals and policies of the Port Master Plan related to Wetlands.

With coordination throughout the planning and implementation of this alternative with the adjacent jurisdictions, including the cities of San Diego, Imperial Beach, and Chula Vista and the Port of San Diego, no significant adverse land use impacts to these agencies' land use goals are anticipated. Further, no aspect of Alternative B would interfere with nearby aircraft or military operations. The proposed change to the project site would also not result in any conflicts with existing or future allowable land uses on adjacent properties, which include open space, industrial use, and residential use. Therefore, no significant impacts related to land use are anticipated.

Moreover, under Alternative B, the current habitat and wildlife management activities occurring on the Otay River Floodplain Site would change from upland habitat management to wetland management, and the Pond 15 Site would be converted from solar salt pond to tidally influenced

wetland habitat. The change in habitat type associated with the proposed action would have no substantive impact on surrounding land uses, with the exception of flooding off site, which would result in a beneficial impact from the raising of the levee between Pond 22 and Pond 23. Raising the levee would reduce downstream flooding during a 100-year storm event (see Section 2.3.2, Features Common to Both Action Alternatives). However, construction activities related to the excavation and transport of material from the Otay River Floodplain Site to the Pond 15 Site would temporarily affect the views of the site from surrounding land uses and could produce noise audible from nearby residential and recreational uses. Although these temporary impacts could be considered a nuisance by some residents, the site is far enough from nearby residences that no significant temporary compatibility issues are anticipated, as analyzed in Section 4.2.7, Noise.

Access to the Bayshore Bikeway and the bike path along Saturn Boulevard would be temporarily affected during the construction period. To minimize any disruption to commuter and recreational bicyclists and pedestrians using these bike paths, Mitigation Measure (MM) REC-1 is provided, which would require a flagger to be present during construction to ensure safe access to these paths from Main Street and safe access to the Bay Boulevard portion of the Bayshore Bikeway at the construction access point to the Pond 15 Site. MM-REC-2 is also provided, which would require that the Saturn Boulevard bike path be temporarily realigned to ensure continued access between Main Street and Palm Avenue. With the incorporation of these measures into the scope of the project, no significant impacts to bicycle and pedestrian uses in the area would occur. Additionally, no disruption of use along the Otay Valley Regional Park trail, located to the east of the construction area, is anticipated.

Restoration of the Pond 15 Site and the removal of Pond 15 from the existing solar salt pond operation would reduce, to some extent, the annual production of salt from the solar salt operation. To minimize the impact of removing Pond 15 from the salt operation, the levees around the adjacent ponds would be reconfigured to eliminate any connection to Pond 15 and would be strengthened to avoid disruption of the overall system. Installation of levees and other reinforcement mechanisms would ensure that Pond 15 would function independently of the overall salt pond system operations; therefore, any potential impact the salt ponds may have on the newly restored habitat within Pond 15 would be less than significant.

Mitigation Measures

No significant adverse impacts are anticipated; therefore, no mitigation measures are required.

4.5.1.3 Alternative C

The potential impacts to land use from the implementation of Alternative C would be the same as those described for Alternative B. Alternative C would also be consistent to the maximum extent practicable with the principal components of the California Coastal Management

Program, namely the planning and management policies presented in Chapter 3 of the California Coastal Act, as presented in Appendix N to this EIS. Similar to Alternative B, Alternative C would also be consistent with the Port Master Plan following implementation of mitigation measures MM-BIO-2, MM-BIO-5, MM-BIO-7, MM-BIO-9 and MM-BIO-10 which would mitigate potential impacts to sensitive species and habitat that may occur within the Pond 15 levee breach inlet/outlet area to a level that is less than significant. Therefore, land use impacts associated with implementation of Alternative C would be less than significant.

Mitigation Measures

No significant adverse impacts are anticipated; therefore, no mitigation measures are required.

4.5.2 Traffic, Circulation, and Parking

This section presents the estimated level of traffic that could be generated by the construction/ restoration activities associated with the various alternatives. Also included in this section is an analysis of the potential impacts of project-related traffic on local and regional traffic circulation and an analysis of the impacts that an increased demand for parking could have on the surrounding area.

Significance Threshold: Impacts related to traffic would be considered significant if project-related traffic would exceed accepted increases in roadway volume-to-capacity ratios as established by the affected jurisdictions; if road capacities would be exceeded; if sight distance provided at ingress/egress points would be inadequate; or if the proposed action would substantially alter the demand for on- and/or off-street parking spaces.

4.5.2.1 Alternative A

Under this alternative, the Otay River Floodplain Site would remain undeveloped and inaccessible to the public, and would generate a minimal number of vehicle trips associated with maintenance activities for the San Diego Bay NWR. Vehicle trips associated with South Bay Salt Works operations would remain consistent with the existing condition. This alternative would not result in any additional trip generation; therefore, no significant adverse impacts related to traffic (including impacts to existing road capacity) or parking are anticipated.

Mitigation Measures

No significant adverse impacts are anticipated; therefore, no mitigation measures are required.

4.5.2.2 Alternative B

Under Alternative B, approximately 320,000 cubic yards of material would be excavated from the Otay River Floodplain Site, of which approximately 260,000 cubic yards would be transported to the Pond 15 Site. Construction methods have not yet been finalized for transportation of the excavated material from the Otay River Floodplain Site to the Pond 15 Site. The three options proposed include the use of a conveyor belt, transporting the material in 12-cubic-yard haul trucks, or routing it through a slurry pipeline, as outlined in detail in Section 2.3.2. To be conservative, this analysis assumes that the material would be transported between sites on haul trucks using area roadways because this would have the most substantial impact on transportation and circulation.

Table 4.5-2 lists the trips associated with construction under Alternative B. Transporting 260,000 cubic yards of material from the Otay River Floodplain Site to the Pond 15 Site would require approximately 56,000 total one-way truck trips (or 28,167 round-trips) based on the 12-cubic-yard capacity of the haul trucks proposed for construction and a bulking factor of 1.3 (Appendix E). Assuming 209 working days, as proposed under a 6-day work week and avoidance of the core nesting season, approximately 270 one-way haul truck trips per day would be required to haul the 260,000 cubic yards of material from the Otay River Floodplain Site to the Pond 15 Site.

Table 4.5-2
Alternative B Maximum Daily Trip Generation

Activity	Start Date	Finish Date	Duration (months)	Work Days[a]	Hauling Truck Trips Per Day	Construction Worker Trips	Vendor Trips and Material Deliveries
Mobilization	8/1/2017	9/30/2017	2	53	0	50	20
Dewatering Pond 15	10/1/2017	11/1/2017	1	27	0	50	20
Earthwork	10/1/2017	1/31/2018	4	105	270	50	48
Demobilization	2/1/2018	2/28/2018	1	24	0	50	20
Core nesting season	3/1/2018	7/31/2018	5	N/A	N/A	N/A	N/A
Remobilization	8/1/2018	8/31/2018	1	27	0	50	20
Earthwork	9/1/2018	12/31/2018	4	104	270	50	48
Demobilization	1/1/2019	2/28/2019	2	51	0	50	20
Core nesting season	3/1/2019	7/31/2019	5	N/A	N/A	N/A	N/A
Remobilization	8/1/2019	8/31/2019	1	27	0	50	20
Pond15 Site grading	9/1/2019	12/31/2019	4	87	0	50	20

Notes: N/A = not applicable.
[a] Based on 6 work days a week

In total, it is estimated that approximately 270 truck trips per day would take place between the Pond 15 Site and the Otay River Floodplain Site from about 7 a.m. to 7 p.m. Monday through

Saturday during the proposed action. The haul route is presented on Figure 2-2, Truck Haul Route. The roadways to be used for material transport include a local street and a two-lane light collector. On any given day when the trucks would be operating, hauling trucks would be present on these streets on a regular basis throughout the day, with one truck leaving the Otay River Floodplain Site every 5 minutes, resulting in about 24 trucks along the route in a 1-hour period. In addition to the truck trips that would be generated under this transport option, up to 50 additional daily construction worker (truck driver) trips could be generated, and an additional 20 vendor trips or material deliveries would be generated throughout the construction period. Although the addition of trucks on the road during hauling activities would result in additional congestion on the haul truck route roadways, based on the low volume of traffic on the roads designated as the haul route (see Table 3.5-1), the presence of 25 trucks per hour (approximately one truck every 2–3 minutes) would not be expected to cause substantial congestion that would interfere with the use of the roads by existing traffic or interfere with access to the properties along the route.

Generally, the material deliveries, vendor trips, and construction worker trips would not overlap with the haul truck trips because construction workers would generally arrive early in the morning, before other trips associated with project construction. Additionally, material deliveries would be intermittent and would vary depending on project needs. Moreover, no truck trips would be generated during the 4-month core nesting season because construction would temporarily cease in order to avoid biological impacts, as discussed further in Section 4.3 of this EIS.

To minimize traffic congestion, all large construction equipment being delivered or removed from the site via ground transport would access the site only via Main Street and only during off-peak traffic hours.

Construction access to the Pond 15 Site would be through a San Diego Bay NWR easement located off Bay Boulevard just north of the intersection of Bay Boulevard and Palomar Street. To provide access to the site for construction equipment during construction, temporary dirt roads would be established and maintained for public safety. Access to both portions of the project site would be controlled through the use of gates, fencing, and site security services. Traffic flow in and out of the construction sites would be controlled by a flagger to avoid traffic congestion as haul trucks move in and out of the site and to ensure public safety along the Bayshore Bikeway and on the Otay Valley Regional Park trail and temporary alignment of the Saturn Boulevard bike path.

As shown on Figure 2-2, loaded haul trucks from the Otay River Floodplain Site would exit the site onto West Frontage Road, turn left onto Anita Street, turn right onto Bay Boulevard, cross Palomar Street, and then turn left off Bay Boulevard onto a San Diego Bay NWR easement. To dispose of the material transported from the Otay River Floodplain Site to Pond 15 Site, trucks would travel along the levee surrounding the Pond 15 Site via a loop to be created to facilitate

efficient truck movement within the site. The total round-trip loop between the Otay River Floodplain Site and Pond 15 Site is approximately 7 miles and would take approximately 36 minutes. It is anticipated that the haul truck trips between the two sites would occur during both earthwork phases, and would not occur during the demobilization proposed during the core nesting season.

The roadways where the material would be transported include West Frontage Road, Anita Street, and Bay Boulevard (a two-lane light collector, a local street, and a two-lane light collector respectively). Although capacities on the affected streets are low (refer to Table 3.5-1), all but Main Street are operating well above level of service (LOS) D. The segment of Main Street between West Frontage Road and Interstate 5 (I-5) currently operates below LOS D, with a capacity of 9,000 average daily trips and an estimated volume of 23,500 average daily trips. The majority of this traffic is likely coming from the southbound I-5 exit to travel east on Main Street. The proposed truck traffic would not interfere with that traffic pattern, because it would travel on Main Street only to West Frontage Road, located to the west of the I-5 off-ramp. This, along with traffic control at the exit from the construction site onto Main Street, would avoid any significant adverse traffic impacts on this road segment. With the implementation of MM-TRA-1, the truck and other construction trips associated with implementation of Alternative B would not be expected to cause congestion that would interfere with the use of the roads by existing traffic or interfere with access to the properties along the route.

For construction workers and material deliveries, the roadways that would mainly be used to access the project sites are West Frontage Road, Anita Street, Bay Boulevard, Main Street, and I-5. These trips would not be expected to cause congestion that would interfere with the use of the roads by existing traffic or interfere with access to the properties along the route, because trips would be dispersed throughout the day. Construction staging areas would be located on the eastern side of the Otay River Floodplain Site (as shown on Figure 2-1a), which would keep construction equipment and worker vehicles out of the public roadway when not in use.

Construction worker vehicles would be parked in the staging area on the Otay River Floodplain Site, east of Nestor Creek, as shown on Figure 2-1a. Therefore, there would be no increase in demand off site for on- or off-street parking spaces. To avoid impacts to other users in the area, construction workers would not be permitted to park in trail staging areas or in areas that could pose a safety threat to users of the Bayshore Bikeway. In addition, parking in nearby parking lots would be permitted only if prior authorization has been provided by the property owner.

During and after construction, both sites would be closed to the public. Therefore, there would be no additional trips generated and no increased parking demand due to public use. Once initial restoration activities are completed, trips to the project site would occur in conjunction with site monitoring and maintenance. The number of trips associated with these activities would be

small, but slightly higher than the minimal number of trips made to the site for maintenance and monitoring under existing conditions. Vehicles associated with maintenance and monitoring would park either near the staging area on the Otay River Floodplain Site or on the levees of the Pond 15 Site. Overall, once construction of the restored wetlands is complete, there would be no measurable increase in traffic or parking on area roadways resulting from this alternative.

Trips generated by the implementation of Alternative B are not expected to alter the LOS on any area roadway segment or intersection. In addition, all affected roadways and intersections operate at a LOS C or above under existing conditions, as outlined in Tables 3.5-1 and 3.5-2. Construction phase trips are not expected to result in any substantial traffic congestion on these roadways and intersections with the implementation of MM-TRA-1 and MM-TRA-2. The proposed action does not include an increased long-term transportation component. Therefore, the project would not exceed the volume-to-capacity ratios in the established applicable jurisdictions, or substantially alter the demand for on- or off-street parking spaces.

Although the average daily trips occurring on the surrounding roadways is below the current design capacity, if material deliveries, construction worker trips, and haul truck trips all occur during the peak hour, there is a potential for increased traffic congestion on area roadways. To offset these potential impacts, MM-TRA-1 and MM-TRA-2 are provided. All potentially significant impacts associated with implementation of Alternative B would be reduced to less than significant through the implementation of MM-TRA-1 and MM-TRA-2. No significant adverse impacts related to traffic and parking are therefore anticipated.

Mitigation Measures

The following mitigation measures have been incorporated to avoid or minimize potentially significant traffic impacts associated with construction activities occurring on roadways.

MM-TRA-1 Prior to the commencement of any sediment transport, a construction area traffic control plan or detour plan shall be prepared for each location where construction activities would encroach into the right-of-way of a public roadway. The plans would include, but not be limited to, such features as warning signs, lights, flashing arrow boards, barricades, cones, lane closures, flaggers, pedestrian detours, parking restrictions, and restricted hours during which lane closures would not be allowed (e.g., 7 to 9 a.m. and 4 to 6 p.m.) or as determined by the U.S. Fish and Wildlife Service (Service).

MM-TRA-2 The contractor shall schedule all deliveries of construction materials and equipment to the project site to avoid peak-hour traffic congestion (e.g., 7 to 9 a.m. and 4 to 6 p.m.) or as determined by the Service.

4.5.2.3 Alternative C

Approximately 370,000 cubic yards of material would be excavated from the Otay River Floodplain Site under Alternative C, of which approximately 310,000 would be transported to the Pond 15 Site, while the remaining material would be used to construct the project features or stockpiled on the Otay River Floodplain Site east of Nestor Creek. As described under Alternative B, construction methods have not yet been finalized for transportation of the excavated material from the Otay River Floodplain Site to the Pond 15 Site, and three options for sediment transport are proposed. To be conservative, this analysis assumes that the material would be transported between sites on haul trucks using area roadways, as this would have the most substantial impact on transportation and circulation. The truck haul route proposed for Alternative C would be the same as proposed for Alternative B, as outlined on Figure 2-2.

Table 4.5-3 lists the trips associated with construction under Alternative C. Transporting 310,000 cubic yards of material from the Otay River Floodplain Site to the Pond 15 Site would require 67,100 total truck trips (or 33,550 round-trips) based on the 12-cubic-yard capacity of the haul trucks proposed for construction and a bulking factor of 1.3 (Appendix E). Assuming 209 working days, as proposed under a 6-day work week schedule and avoidance of the core nesting season, approximately 321 haul truck trips per day (approximately 29 trips per hour, or approximately 1 trip every 2 minutes) would be required to haul the 310,000 cubic yards of material between the Otay River Floodplain Site and the Pond 15 Site. Similarly to Alternative B, no truck trips would be generated during the 4-month core nesting season.

Table 4.5-3
Alternative C Maximum Daily Trip Generation

Activity	Start Date	Finish Date	Duration (months)	Work Days[a]	Hauling Truck Trips Per Day	Construction Worker Trips	Vendor Trips and Material Deliveries
Mobilization	8/1/2017	9/30/2017	2	53	0	50	20
Dewatering Pond 15	10/1/2017	11/1/2017	1	27	0	50	20
Earthwork	10/1/2017	1/31/2018	4	105	321	50	48
Demobilization	2/1/2018	2/28/2018	1	24	0	50	20
Core nesting season	3/1/2018	7/31/2018	5	N/A	N/A	N/A	N/A
Remobilization	8/1/2018	8/31/2018	1	27	0	50	20
Earthwork	9/1/2018	12/31/2018	4	104	321	50	48
Demobilization	1/1/2019	2/28/2019	2	51	0	50	20
Core nesting season	3/1/2019	7/31/2019	5	N/A	N/A	N/A	N/A
Remobilization	8/1/2019	8/31/2019	1	27	0	50	20
Pond15 Site grading	9/1/2019	12/31/2019	4	87	0	50	20

Notes: N/A = not applicable.
[a] Based on 6 work days a week

Trips generated by the implementation of Alternative C are not expected to alter the LOS on any area roadway segment or intersection. In addition, all affected roadways and intersections operate at a LOS C or above under existing conditions, as outlined in Tables 3.5-1 and 3.5-2. Construction phase trips are not expected to result in any substantial traffic congestion to these roadways and intersections with the implementation of MM-TRA-1 and MM-TRA-2. The proposed action does not include an increased long-term transportation component. Therefore, the project would not exceed the volume-to-capacity ratios in the established applicable jurisdictions, or substantially alter the demand for on- or off-street parking spaces.

Although the average daily trips occurring on the surrounding roadways is below the current design capacity, if material deliveries, construction worker trips, and haul truck trips all occur during the peak hour, there is a potential to cause traffic congestion on area roadways. To offset these potential impacts, MM-TRA-1 and MM-TRA-2 are provided. All potentially significant impacts associated with implementation of Alternative C would be reduced to less than significant through the implementation of MM-TRA-1 and MM-TRA-2. No significant adverse impacts related to traffic and parking are therefore anticipated.

Mitigation Measures

MM-TRA-1 and MM-TRA-2 have been incorporated to avoid or minimize potentially significant traffic impacts associated with construction activities occurring on roadways. See Section 4.5.2.2, Alternative B, for the text of these mitigation measures.

4.5.3 Public Utilities/Easements

This section analyzes the potential impacts of the various management alternatives on existing public utilities and easements in the immediate vicinity of the San Diego Bay NWR. The information provided in this section is based on the *Otay River Estuary Restoration Project Existing Utility Investigation Final Report* conducted by Everest International Consultants in August 2015, provided as Appendix L of this EIS.

Significance Threshold: Direct or indirect impacts to public utilities and easements would be considered significant if project implementation has the potential to damage existing utilities, interrupt utility service, or modify access to existing utilities.

4.5.3.1 Alternative A

This alternative would involve continuing current wildlife and habitat management practices at the Otay River Floodplain Site and retaining Pond 15 within the current configuration of the existing South Bay Salt Works. Since no changes to current operations would occur, this alternative would not result in a direct or indirect damage to utilities, utility service, or other public utility easements.

Mitigation Measures

No significant adverse impacts are anticipated; therefore, no mitigation measures are required.

4.5.3.2 Alternative B

Although no public utilities or easements are present within the construction footprints of the Otay River Floodplain Site or Pond 15 Site, there are a number of utilities and easements within the Otay River floodplain to the east of the construction site, as shown in Figures 3.5-2 through 3.5-6, and as described in Appendix L. Construction access to the Otay River Floodplain Site would require the creation of a temporary construction access road that would likely travel along a portion of the existing bike path east of the site boundary. Depending on the haul method chosen for transporting material from the Otay River Floodplain Site to the Pond 15 Site, this access route may function as the primary material transport route in addition to providing access to the site for project mobilization and demobilization and for construction worker access. To ensure that construction activities associated with the implementation of Alternative B do not interfere with or damage existing utilities in this area, MM-UTL-1 has been incorporated into the scope of the project. This measure requires coordination with individual utility agencies prior to U.S. Fish and Wildlife Service (Service or USFWS) approval of the 100% construction drawings to ensure that no actions associated with this proposal would damage or adversely affect utilities, utility service, or utility easements.

Mitigation Measures

The following mitigation measure has been incorporated to avoid the potential for impacts to public utilities, utility service, or utility easements associated with construction activities:

MM-UTL-1 Prior to the completion of final project construction plans, individual utility agencies with utilities located within or adjacent to areas of construction activity shall be contacted to determine the extent and type of temporary protective measures that must be implemented to prevent construction damage to surface and subsurface utilities.

4.5.3.3 Alternative C

The potential impacts to utilities, utility service, or utility easements under Alternative C would be the same as those described under Alternative B, and MM-UTL-1 would also be implemented under Alternative C to avoid or minimize damage or significant adverse impacts to utilities, utility service, or utility easements.

Mitigation Measures

MM-UTL-1 has been incorporated into the scope of the proposed action to avoid the potential for impacts to public utilities and easements associated with construction activities for Alternative C.

4.5.4 Public Access and Recreational Opportunities

Significance Threshold: Impacts to public access, education, and recreational opportunities would be considered significant if substantial modification to existing public recreation and educational activities or opportunities would occur as a result of the proposed action or if existing public access would be substantially altered.

4.5.4.1 Alternative A

No public access is currently permitted on either the Otay River Floodplain Site or the Pond 15 Site. Under Alternative A, public access would continue to be restricted on both project sites, and access to the San Diego Bay NWR would remain limited to access as approved by the Service, such as occasional guided nature tours at the South Bay Salt Works outside of the seabird nesting season. Visual access to the site during recreational activities available on the Bayshore Bikeway would remain unobstructed. Public access to the San Diego Bay for boating and fishing activities in the open waters would still be available, and no existing public access routes through the San Diego Bay NWR would be altered or removed. Under the no action alternative, there would be no significant adverse impacts to public access, educational activities, or recreational opportunities.

Mitigation Measures

No significant adverse impacts are anticipated; therefore, no mitigation measures are required.

4.5.4.2 Alternative B

Under Alternative B, the two project sites would continue to be closed to public access during construction and after restoration is completed. Access as approved by the Service, such as occasional guided nature tours at the South Bay Salt Works outside of the seabird nesting season, could continue but would not include the area around the Pond 15 Site while construction activities are underway. After construction, the pre-project tour route may be altered to eliminate access in the vicinity of Pond 15; however, access around other ponds in the system would continue to be available.

The Bayshore Bikeway, the 24-mile bicycle facility that extends around the San Diego Bay, passes along the northern border of the Otay River Floodplain Site in an area located outside the boundaries of the San Diego Bay NWR. General use of the Bayshore Bikeway and surrounding linkages includes recreational and commuter bicyclists, along with walkers, joggers, in-line

skaters, and birdwatchers. Under this alternative, access to the Bayshore Bikeway could be disrupted for short periods. If the conveyor belt or slurry method of soil transport is selected, it may be necessary for construction crews to be temporarily present on the bike path while they are extending the required equipment under the path at the eastern bridge site where the path crosses the Otay River channel. In this case, a potential impact to the bike path may occur. To mitigate this potential impact, MM-REC-1 has been proposed. This measure requires signage to be provided prior to any construction work to alert bicyclists and other users of scheduled events, and requires a flagger to be present during construction activities to ensure the safety of all users.

If the truck transport method is selected, trucks would cross the bike path just north of the intersection of Palomar Street and Bay Boulevard. Protective devices (such as specialized rubber mats) that are not damaging to bicycle tires would be installed over the path to avoid damage from construction vehicles. In addition, trucks would cross the access to the southern portion of the Bayshore Bikeway where it intersects with Main Street. As outlined in MM-REC-1, signs would be installed to alert riders to the presence of protective materials on the path, and flaggers would be present to control trucks and bicycle traffic during active construction periods.

The implementation of Alternative B could also affect the Bayshore Bikeway by altering existing flood elevations and flood flow velocities downstream of I-5. In the existing condition, the Bayshore Bikeway begins to be flooded during the 10-year and 15-year storm event. With the implementation of Alternative B, the bike path would no longer be flooded during the 10-year storm event. Alternative B would not alleviate flooding of the bike path under the 100-year storm event, but it would prevent flooding of the bike path for smaller and more frequent flood events (Appendix H). More information is provided in Section 4.2.5.2, Tidal Flow Impacts, of this EIS.

To avoid potential impacts to users of the City's bike path that extends from Saturn Boulevard to Main Street in an area to the east of the Otay River Floodplain Site, this bike path would be rerouted during construction to avoid conflicts between bicyclists and construction vehicle ingress and egress from the Otay River Floodplain Site. The temporary bike path reroute, shown on Figure 2-1a, would direct users onto the existing Otay Valley Regional Park trail until the trail crosses the Otay River; then the trail would turn west and reconnect with the existing bike path. This reroute would include a paved pathway and signs for users during construction. MM-REC-2 is provided to offset any impacts associated with this reroute. Although public use may be temporarily affected on the Bayshore Bikeway and surrounding paths during construction, once restoration is complete, all public paths and public access to them would be completely restored to pre-project conditions.

Other recreational activities, such as boating and fishing within the open waters surrounding the project site, would not be affected under this alternative.

Implementation of Alternative B would result in construction-related impacts to surrounding public access facilities, including the Bayshore Bikeway and Saturn Boulevard bike path. Significant adverse impacts would be reduced through the incorporation of MM-REC-1 and MM-REC-2.

Mitigation Measures

The following mitigation measures are provided to avoid or minimize potentially significant impacts associated with conflicts between public access and construction activities occurring on the project site under Alternative B.

MM-REC-1 Prior to any construction activity in the Bayshore Bikeway, the contractor shall install signs to alert riders to the presence of protective materials on the path and of potential intermittent closures during construction. During active construction, flaggers shall be present to control trucks and bicycle traffic on the Bayshore Bikeway, with flaggers present at the Main Street/Frontage Road entrance to the Bayshore Bikeway, as well as at the access point to the Pond 15 Site where the access point crosses the Bikeway. The contractor shall maintain the Bikeway in good repair at all times, provide protective barriers as necessary, and be responsible for restoring the Bikeway to pre-project conditions following completion of construction activities.

MM-REC-2 Prior to the commencement of project construction, a reroute of the Saturn Boulevard bike path shall be designed and permitted, and prior to any other construction associated with the project, the contractor shall complete the approved temporary reroute of the bike path. Design, permitting, and construction shall be conducted in coordination with the City of San Diego Streets Division and County of San Diego Park and Recreation Department. The project construction documents shall indicate that the contractor is responsible for restoring the existing bike path to preconstruction conditions following completion of all construction activities.

4.5.4.3 Alternative C

The potential impacts to public access, education, and recreational opportunities from the implementation of Alternative C would be the same as those described for Alternative B.

Mitigation Measures

MM-REC-1 and MM-REC-2 would also be implemented under Alternative C to avoid or minimize potentially significant impacts associated with construction activities occurring within the Bayshore Bikeway and Saturn Boulevard bike path.

4.5.5 Vectors and Odors

This section discusses the direct and indirect impacts with respect to vector breeding and odor generation of implementing the proposed action.

Significance Threshold: Impacts related to vectors and odor would be considered significant if the proposed action has the potential to substantially alter wetland conditions conducive to mosquito breeding or to substantially alter the potential for odors to be generated from within the project site.

4.5.5.1 Alternative A

Under this alternative, the Pond 15 Site would continue to generate potentially offensive odors due to decomposition of organic materials within shallow warm water. The mosquito composition and potential breeding habitat for the species in the Otay River and Nestor Creek discussed in Section 3.5.5, Vectors and Odors, of this EIS would remain unaltered. Alternative A would not result in substantial alteration of wetland conditions conducive to mosquito breeding or increase the potential for odors to be generated. No significant impacts are anticipated.

Mitigation Measures

No significant adverse impacts are anticipated; therefore, no mitigation measures are required.

4.5.5.2 Alternative B

Vectors

The majority of the mosquito populations and potential breeding habitat in the vicinity of the project includes fresh and brackish waters in Nestor Creek and the Otay River. Standing water could provide potential habitat for a variety of mosquito species found in the South Bay, in particular *Ochlerotatus taeniorhynchus* and *O. squamiger*. These species are not known to carry human diseases, but can be a nuisance during certain times of the year. The saltmarsh habitat that would be restored at the Otay Floodplain Site and Pond 15 Site under Alternative B would be inundated daily by the tides and has been designed to avoid the presence of standing water; therefore, the proposed restoration under Alternative B would not provide additional breeding habitat for mosquitos. Additionally, the wetlands would be graded so that no pooling water would be created above areas that are influenced by the tides.

The mosquito community in the San Diego Bay NWR would continue to be monitored under all alternatives by the San Diego County (County) Department of Environmental Health, and appropriate control actions would be considered by the San Diego Bay NWR if mosquito populations become a significant nuisance to adjacent residences. The County Department of Environmental Health, under a Special Use Permit issued by the Service (permit no. 81681-

14003), would implement vector control measures on San Diego Bay NWR lands, including the application of larvicides or adulticides. Prior to such use of vector control measures, the County, as specified in the Special Use Permit, shall initiate coordination with the Service to avoid or minimize any potential adverse effects to San Diego Bay NWR lands. Additionally, as specified in the Special Use Permit, mosquito population control techniques during non-emergency conditions shall stress the use of biocontrol agents prior to the use of chemical larvicides or adulticides and shall dispense mosquito control compounds in accordance with U.S. Environmental Protection Agency regulations for each compound. County staff shall coordinate with San Diego Bay NWR staff on all actions taking place on NWR lands. Moreover, as specified in the Special Use Permit, at the beginning of each year's migratory bird nesting season (prior to April 15), County field staff shall meet with San Diego Bay NWR biological and management staff to identify field protocols for avoidance and minimization of take to any trust resources, including listed species and their habitats and migratory birds (USFWS 2014).

Odors

Odors are a form of air pollution that is most obvious to the general public. Odors can present significant problems for both the source and surrounding community. Although offensive odors seldom cause physical harm, they can be annoying and cause concern.

Section 6318 of the San Diego County Zoning Ordinance requires that all commercial and industrial uses be operated so as not to emit matter causing unpleasant odors that are perceptible by the average person at or beyond any lot line of the lot containing said uses. Section 6318 goes on to further provide specific dilution standards that must be met "at or beyond any lot line of the lot containing the uses" (County of San Diego 1979). SDAPCD Rule 51 (Public Nuisance) also prohibits emission of any material that causes nuisance to a considerable number of persons or endangers the comfort, health, or safety of any person. A proposed project that involves a use that would produce objectionable odors would be deemed to have a significant odor impact if it would affect a considerable number of off-site receptors.

Construction of Proposed Project would result in the emission of diesel fumes and other odors typically associated with construction activities. These compounds would be emitted in varying amounts on the site depending on where construction activities are occurring, number and types of construction activities occurring, and prevailing weather conditions, among other factors. A variety of sensitive receptors surround the general vicinity of the South San Diego Bay Unit of the San Diego Bay NWR, including the San Diego Bay NWR itself. These receptors include a mobile home park located to the south of the Otay River Floodplain within the City of San Diego, residential uses and an elementary school located along the south end of the San Diego Bay within the City of Imperial Beach, residential units scattered among small industrial uses to the east of Pond 15, and residential development located just to the west of the San Diego Bay

NWR boundaries in the City of Coronado. However, all odor impacts would be temporary and would cease with completion of the project. Odors from construction activities would be localized in the immediate vicinity of the construction site and would be limited to a finite, temporary period of time. Therefore, impacts related to odors during construction would be **less than significant**.

Land uses and industrial operations that are associated with odor complaints include agricultural uses, wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. The project would not include any of these operational activities typically associated with odors. Additionally, the proposed project would be required to comply with the County odor policies enforced by SDAPCD, including Rule 51 in the event a nuisance complaint occurs, and County Code Sections 63.401 and 63.402, which prohibit nuisance odors and identify enforcement measures to reduce odor impacts to nearby receptors. Thus, the impacts associated with odors would be **less than significant**.

Mitigation Measures

No significant adverse impacts are anticipated; therefore, no mitigation measures are required.

4.5.5.3 Alternative C

The potential impacts to vectors and odors from the implementation of Alternative C would be the same as those described for Alternative B.

Mitigation Measures

No significant adverse impacts are anticipated; therefore, no mitigation measures are required.

4.5.6 Economics/Employment

This section discusses the direct and indirect economic impacts on the regional economy of implementing the proposed alternatives.

Significance Threshold: Impacts to the regional economy would be considered significant if the proposed action could substantially alter existing employment levels within the local or regional economy, set a precedent for future development trends in the project vicinity, or seriously interfere with daily operations on adjacent commercial and industrial properties.

4.5.6.1 Alternative A

Implementation of this alternative would have no benefits or significant adverse impacts on the economy or employment within the region. Alternative A would not substantially alter existing

employment levels within the local or regional economy, set a precedent for future development trends in the project vicinity, or seriously interfere with daily operations on adjacent commercial and industrial properties.

Mitigation Measures

No significant adverse impacts related to economics or employment are anticipated; therefore, no mitigation measures are required.

4.5.6.2 Alternative B

Under this alternative, the Otay River Floodplain Site, as a portion of the San Diego Bay NWR, would continue to lack direct employment opportunities and would not make a notable contribution to the regional economy, due to lack of entrance fees or public access to this portion of the San Diego Bay NWR.

The South Bay Salt Works, a commercial solar salt operation that encompasses the Pond 15 Site, would continue to operate without the use of Pond 15. The South Bay Salt Works is currently using Pond 15 as an evaporation pond. Construction operations associated with implementation of Alternative B have the potential to affect the operations at this facility. To offset any potential impacts, MM-ECO-1 has been identified to require coordination between the contractor and the adjacent facility.

Once construction is complete, restoration of the Pond 15 Site would remove this evaporation pond from the existing operation. However, as outlined in Section 3.5.6, Economics/ Employment, this operation makes minimal input into the local and regional economy. To minimize the impact of removing Pond 15 from the salt operation, the levees around the adjacent ponds would be reconfigured to eliminate any connection to Pond 15 and would be strengthened to avoid disruption of the overall system. Additionally, the programmatic EIS prepared for management of the San Diego Bay NWR that this EIS tiers from includes plans to restore each of the salt evaporation plans in this area to natural, tidally influenced habitat (USFWS 2006).

Alternative B includes restoration that would involve a total expenditure of between $15 and $24 million. Although this is a relatively minor amount of funding when viewed in terms of the regional economy, during construction this would result in direct expenditures that would be used to purchase materials and retain contractors. These expenditures would provide a minor benefit to the regional economy and employment. New opportunities for wildlife observation would have the potential to increase the number of visitors to the area, which could correlate with additional expenditures in retail trade, lodging, and food service. However, none of these impacts would be notable in terms of local or regional economy or employment. Therefore, with the implementation of MM-ECO-1, implementation of Alternative B would not substantially

alter existing employment levels within the local or regional economy or seriously interfere with daily operations on adjacent commercial and industrial properties.

Mitigation Measures

The following mitigation measure has been incorporated to avoid or minimize potentially significant impacts associated with construction activities occurring in the vicinity of the South Bay Salt Works.

MM-ECO-1 To avoid conflicts with ongoing salt works operations, prior to the start of construction, the contractor shall provide the salt works management with an up-to-date construction schedule and timeline of activities related to the restoration project. The salt works management shall also receive monthly updates of construction progress and shall be informed immediately of any changes in the proposed schedule or timeline.

4.5.6.3 Alternative C

The potential for direct and indirect economic impacts on the regional economy from the implementation of Alternative C would be the same as described for Alternative B.

Mitigation Measures

MM-ECO-1 would also be implemented under Alternative C to avoid or minimize potentially significant impacts associated with construction activities occurring in the vicinity of the South Bay Salt Works.

4.5.7 Environmental Justice

This section evaluates the potential for adverse human health or environmental impacts on minority populations or low-income populations living in the vicinity of the project site as a result of implementing the various actions proposed in each alternative.

Significance Threshold: Impacts related to environmental justice would be considered significant if the proposed action would result in disproportionate human health impacts or environmental impacts to low-income or minority populations.

4.5.7.1 Alternative A

This alternative proposes continuing current management practices on the Otay River Floodplain Site, and solar salt production in the Pond 15 Site would not result in any disproportionate impact on human health or associated environmental impact. No significant impacts are anticipated.

Mitigation Measures

No significant adverse impacts related to environmental justice are anticipated; therefore, no mitigation measures are required.

4.5.7.2 Alternative B

Restoration of the project site under this alternative would have long-term benefits to biological resources. No significant and unavoidable impacts have been identified within this EIS. Although the median income within the general project vicinity is lower than the County average, and there is a larger racial minority population in this area, no significant adverse impacts are anticipated as a result of implementing Alternative B. Therefore, there would be no disproportionate adverse human health impacts or environmental impacts to any low-income or minority populations in the areas surrounding the project site.

Mitigation Measures

No significant adverse impacts related to environmental justice are anticipated; therefore, no mitigation measures are required.

4.5.7.3 Alternative C

The potential impacts to environmental justice from the implementation of Alternative C would be the same as those described for Alternative B.

Mitigation Measures

No significant adverse impacts are anticipated; therefore, no mitigation measures are required.

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4.6 CUMULATIVE IMPACTS

Cumulative impacts can result from the incremental impacts of a project when added to other past, present, and reasonably foreseeable projects in the area. Cumulative impacts can result from individually minor but cumulatively significant actions over a period of time. This analysis is intended to consider the interaction of the proposed Otay River Estuary Restoration Project (ORERP or proposed action) with other actions occurring over a larger geographic area and time frame. The interrelated impacts of separate actions under the alternatives are also considered.

In order to provide a comprehensive list of projects that may result in cumulative impacts, the Port of San Diego (Port of San Diego; Port) and the cities of San Diego, Imperial Beach, Coronado, National City, and Chula Vista were all contacted to obtain information about past, present, and reasonably foreseeable projects within their jurisdiction.

4.6.1 Projects Considered in the Cumulative Impacts Analysis

Bayshore Bikeway

The Bayshore Bikeway is a 24-mile bicycle facility that would extend around the perimeter of the San Diego Bay when completed. Though much of the bikeway has been built, there are sections pending the Chula Vista Bayfront redevelopment along the eastern perimeter of the Bay north of the project site (SANDAG 2014).

Tijuana Estuary Tidal Restoration Program

The Tijuana Estuary Tidal Restoration Program would restore coastal wetlands in southern San Diego County, California, at the western end of the Tijuana River Valley. The project, which is the second phase of a larger restoration project, would produce a restoration plan for between approximately 250 to 300 acres in Friendship Marsh. When implemented, the Tijuana Estuary Tidal Restoration Program is expected to restore habitat values that have been lost and improve tidal exchange within the existing and future marsh. A secondary objective of this project is to identify options for protecting and enhancing the existing barrier beach. The project would attempt to address sand loss and the associated endangerment of critical habitats when high storm waves surge across the depleted dunes and into the salt marsh.

Chula Vista Bayfront Master Plan

In 2012 the Port of San Diego and the City of Chula Vista approved plans for the redevelopment of approximately 550 acres of land and water located along the eastern edge of the San Diego Bay between the Sweetwater Marsh Unit and the South San Diego Bay Unit. Plans within the 550 acres of waterfront include development of a broad range of urban uses, including high- and

mid-rise residential development, commercial and office space, hotels, restaurants, major entertainment facilities, public open space, improvements to the existing harbor, and relocation of the existing boat channel in the south San Diego Bay (South Bay).

Implementation of the Chula Vista Bayfront Master Plan is anticipated to span approximately 30 years. Potential significant impacts identified in the environmental impact report for the Master Plan include impacts on land/water use compatibility, traffic and circulation, aesthetics/visual quality, hydrology/water quality, air quality, energy, noise, terrestrial biological resources, marine biological resources, paleontological resources, hazards and hazardous materials/public safety, public services, public utilities, and seismic/geologic hazards (Port 2008).

Multiple Species Conservation Planning

Preservation of the San Diego region's biological resources is being addressed through the implementation of regional habitat plans. In southwestern San Diego County, the Multiple Species Conservation Program (MSCP) would preserve a network of habitat and open space in an effort to conserve various species and protect the region's biodiversity. The MSCP is designed to preserve native vegetation and meet the habitat needs of multiple species, rather than focusing preservation efforts on one species at a time.

Several jurisdictions and various special districts are participating in the MSCP, including the cities of San Diego and Chula Vista and the County of San Diego (County). These jurisdictions have completed subarea plans that identify core biological resource areas targeted for conservation and describe specific mechanisms for implementing habitat preserves. To ensure the implementation of the subarea plans and the identified preserves, each jurisdiction has entered into an agreement with the U.S. Fish and Wildlife Service and the California Department of Fish and Wildlife. Impacts to biological resources are managed through the various subarea plans. Compliance with the subarea plans, along with conformance to Federal and State regulations, is intended to reduce significant cumulative impacts to biological resources to below a level of significance.

The Otay River Floodplain Site and the Pond 15 Site, as well as adjacent properties, are located within the City of San Diego's (City's) Multi-Habitat Planning Area – Southern Area (City of San Diego 1997). The South San Diego Bay Unit and the Sweetwater Unit within the San Diego Bay National Wildlife Refuge (NWR) Complex represent the Federal government's contribution to the MSCP.

Naval Base Coronado Coastal Campus

The Naval Base Coronado Coastal Campus project involves consolidating Naval Special Warfare Command facilities to one location on Silver Strand Training Complex South. The project includes design and construction of logistical support buildings, equipment use and

maintenance training facilities, classroom and tactical skills instruction buildings, storage and administrative facilities, utilities, fencing, roads, and parking. The U.S. Department of the Navy (Navy) prepared a Draft Environmental Impact Statement (EIS) for public review in July 2014. This document, which is currently in the process of being finalized based on public comments received, includes analysis of four potential alternatives: the Silver Strand Training Complex–South Bunker Demolition, the Silver Strand Training Complex–South Bunker Retention, the Multi-Installation Alternative, and the No Action Alternative.

Potential environmental impacts addressed in the EIS include land use, recreation, geology and soils, air quality, hazardous materials and waste, water quality and hydrology, noise, biological resources, cultural resources, traffic and circulation, socioeconomics and environmental justice, public health and safety, utilities and public services, coastal uses and resources, and aesthetics.

Otay River Watershed Management Plan and Special Area Management Plan

The County of San Diego, in cooperation with the Port of San Diego and the cities of Chula Vista and Imperial Beach, is currently developing a watershed management plan for the Otay River drainage. The plan involves characterizing the watershed's various resources and land uses, identifying goals and objectives, and assessing and prioritizing threats to existing beneficial uses and natural resources. The plan would also provide a strategy to ensure high water quality standards and protect natural aquatic and upland resources in the watershed.

The County has also obtained Federal funds for the development of a Special Area Management Plan (SAMP) for the Otay River watershed. A SAMP is a comprehensive plan intended to provide for natural resource protection and reasonable economic growth in geographic areas of special sensitivity. This comprehensive planning effort is to be used to assist the Federal, State, and local regulatory agencies with their decision making and permitting authority to protect aquatic resources. Approval of these plans by the U.S. Army Corps of Engineers would result in the issuance of General Permits under the Clean Water Act for projects within the Otay River watershed. The SAMP would identify baseline conditions of the watershed, including water quality and the extent of wetlands, that can be used in other programs.

The SAMP could facilitate development within the watershed that has the potential to result in issues generally related to urbanization of natural areas, including changes in landform, visual quality, hydrology, and air quality; increases in traffic volumes; loss or degradation of native habitat; and impacts to cultural resources.

River Partners Otay River Delta Habitat Restoration Project

River Partners is a 501(c)(3) nonprofit public benefit corporation based in Chico, California, that specializes in restoration planning, riparian habitat restoration, monitoring and research,

land acquisition, agriculture, education and outreach, and non-structural floodplain management. River Partners and the San Diego Bay NWR are restoring 55 acres of riparian habitat by replacing non-native vegetation with structurally diverse native plants to support a variety of neotropical migratory birds, including several listed species, as well as an array of other native wildlife. The project is located in the open space immediately east of the Otay River Floodplain Site.

Redevelopment of Pond 20A

Pond 20A, located immediately south of the Otay River Floodplain Site, is owned by the Port. The long-term plans for this area call for an 84-acre wetland mitigation bank in the center of the site; a 3.1-acre commercial area on the western edge of the site that is intended to complement Imperial Beach's Bikeway Village development; and a 7.9-acre area designated for low-intensity commercial development on the eastern edge of the site.

Port of San Diego Master Plan Update

The Port Master Plan is a document intended to provide the official planning policies, consistent with a general State-wide purpose, for the physical development of the tide and submerged lands conveyed and granted in trust to the San Diego Unified Port District. The update is anticipated to be complete in 2019 (Maher, pers. comm. 2015).

South Bay Wildlife Advisory Group Management Plan

The South Bay Wildlife Advisory Group was formed following a settlement agreement in May 2010 between the Port, the City of Chula Vista, and the Bayfront Coalition. The settlement agreement requires the Chula Vista Bayfront Master Plan to adopt environmental protections that go above and beyond those required by Federal, State, and local laws and regulations, including preparation of a Natural Resources Management Plan for the Chula Vista Bayfront. This is a plan to avoid impacts to natural resources based on the Chula Vista Bayfront.

Merkel Contract to Identify Restoration Opportunities in South San Diego Bay

At a Board of Port Commissioners meeting on January 13, 2015, a resolution was authorized for an agreement between the Port and Merkel & Associates to identify alternatives for the enhancement and restoration of the Chula Vista Bayfront in an amount not to exceed $200,000 in compliance with the Chula Vista Bayfront Master Plan Settlement Agreement with the Bayfront Coalition. Restoration and enhancement options are being discussed for connecting J Street Marsh and the adjacent uplands; naturalizing J Street Channel and Telegraph Creek; accommodating anticipated sea-level rise with recommendations for soft or natural infrastructure; providing habitat connectivity; conducting a hydraulic analysis of water

movement in South Bay; and enhancing mudflats, eelgrass, and existing salt marshes in the area (Port 2014). Implementation of this project is associated with the Chula Vista Bayfront Master Plan (Maher, pers. comm. 2015).

San Diego Bay Integrated Natural Resources Management Plan

This plan, which was sponsored by the Navy and the Port, presents a long-term management strategy for the San Diego Bay. Approved in September 2013, the document was intended to provide direction for stewardship of the Bay's natural resources, while also supporting the ability of the Navy and Port to meet their missions and continue operating within the Bay. The plan's goal is to "Ensure the long-term health, recovery, and protection of San Diego Bay's ecosystem in concert with the Bay's economic, Naval, recreational, navigational, and fisheries needs." The core strategies of the plan include managing and restoring habitats, populations, and ecosystem processes; planning and coordinating projects and activities so they are compatible with natural resources; improving information sharing, coordination, and dissemination; conducting research and long-term monitoring that supports decision making; and creating a stakeholders' committee to ensure collaborative, ecosystem-based problem-solving. The plan contains over 1,000 strategies for achieving better management of the Bay, including the protection, enhancement, and restoration of the Bay's coastal habitats. An important objective of the plan is to improve the effectiveness and success of mitigation and enhancement projects by building a consensus of prioritized need among regulators and project proponents (Port 2013).

South Bay Substation Relocation Project

This project includes the relocation of the existing South Bay Substation in the City of Chula Vista. The existing substation is being relocated approximately 0.5 miles south, to the proposed Bay Boulevard Substation site, which is approximately 2 miles south of the City of National City, approximately 5 miles northeast of the City of Imperial Beach, and approximately 7 miles southeast of downtown San Diego. The existing station, an aging 138/69 kilovolt (kV) substation, is undersized for current transmission system conditions. The updated line would include a bulk replacement power source to connect to the 230 kV transmission lines in the area, including the Otay Metro Power Loop. A Final Environmental Impact Report for the project was published on April 26, 2013. The project is currently under construction, with an anticipated completion date of July 2017 (CPUC 2015).

Charles Company Proposed Development of the Magnesium Chloride Salt Ponds

This restoration project includes an extension of the Bayshore Bikeway from 13th Street along the periphery of Pond 20 with an upland buffer parallel to Palm Avenue and through the City's Otay Valley Regional Park. The intent is to increase bicycle and pedestrian traffic in the area and improve connectivity of the Bayshore Bikeway with bicycling staging areas at the terminus of

19th Street. The project also includes a 1.0-acre visitor-oriented commercial area including bike services, bike rentals, coffee and refreshments, and a potential restaurant overlooking the wetland restoration area (Charles Company 2012). Implementation of this project is not anticipated to begin construction until 2025 (Maher, pers. comm. 2015).

4.6.2 Cumulative Impacts Analysis

4.6.2.1 Cumulative Impacts to the Physical Environment

Topography/Visual Quality

Cumulative impacts to topography and visual quality include modifications to the existing landform from this and other past, present, and reasonably foreseeable actions; if the combined actions would be reasonably expected to substantially alter the overall appearance of the southeastern perimeter of San Diego Bay, the cumulative impact would be considered significant.

The majority of the projects included in the cumulative impacts analysis involve proposals that would alter the existing topography and visual appearance of the area. As discussed in Section 4.2.1, Topography/Visual Quality, implementation of Alternative B (the preferred alternative) and Alternative C would temporarily affect the aesthetic views of the site during construction and in the long term would have beneficial impacts on the visual quality of the project site and the Bay. Potentially significant impacts to visual quality were identified as discussed in Section 4.2; however, with implementation of MM-VIS-1, all impacts would be reduced to a level that is less than significant. As such, the project under either Alternative B or Alternative C would not contribute to a significant adverse impact to the local topography or visual quality. Although some of the projects identified in the general vicinity of the project may alter the appearance of the southeastern perimeter of San Diego Bay, the proposed action would not represent a cumulatively considerable portion of this potential cumulative impact for the reasons identified above. No significant cumulative impacts are anticipated.

Geology, Soils, and Agricultural Resources

Under either action alternative, through implementation of mitigation measures proposed, the ORERP would not trigger or accelerate substantial slope instability, subsidence, ground failure, or erosion affecting on-site facilities, such as levees, or adjacent facilities, such as roadway and railway embankments and bridge abutments and pilings. Several projects included in the cumulative study area would potentially contribute to soil erosion during construction. However, the mitigation measures provided to reduce these impacts would ensure that no cumulative impacts to geology or soils would occur.

Impacts to agricultural resources would be considered cumulatively significant if the proposed action in combination with other past, present, and reasonably foreseeable actions would result in the conversion of a substantial area of land identified by the State as Farmland of Local Importance to non-agricultural uses. Restoration of the project site under either Alternative B or Alternative C would not result in significant impacts to these designated lands. Several of the parcels in the surrounding area are currently designated as Farmland of Statewide or Local Importance, but none are designated as Prime Farmland on the California Department of Conservation's San Diego County Important Farmlands 2010 Map (CDOC 2013). Potentially significant impacts were identified due to potential erosion; however, with implementation of MM-GEO-1and MM-GEO-2, all impacts would be reduced to a less than significant level. Additionally, no active agricultural operations are located in this area, and it has not been an active agricultural area for more than 20 years. Because the proposed action would not result in the conversion of land identified as Prime Farmland or Farmland of Statewide Importance to non-agricultural use, implementation of either Alternative B or Alternative C would not contribute to a significant cumulative impact on agricultural resources.

Mineral Resources

The project site is classified by the City as a Mineral Resource Zone 1, which is an area where no significant mineral deposits are present or where it is judged that there is little likelihood for their presence (City of San Diego 2008). There are no mineral resource zones with high likelihood of mineral and gemstone resources. Therefore, implementation of either Alternative B or Alternative C would not contribute to a significant cumulative adverse impact on mineral resources.

Paleontological Resources

Mitigation measure (MM) PALEO-1 has been provided to ensure that the proposed action would not directly or indirectly damage a unique paleontological resource or site, or disturb resources in a paleontologically sensitive area. Although there may be a potentially significant impact to paleontological resources at the project-level, implementation of either Alternative B or Alternative C would not represent a cumulatively considerable portion of a potential impact.

Hydrology and Water Quality

Cumulative impacts related to fluvial or tidal hydraulics would be considered significant if the proposed action, in combination with other projects in the vicinity, would increase the currently projected 100-year flood elevations upstream or downstream of the project site or could increase flood flow or tidal velocities resulting in measurable scour or erosion upstream or downstream of the project site. Cumulative water quality impacts would be considered significant if the proposed action, in combination with other projects in the vicinity, would result in violations of water quality

standards or waste discharge requirements, substantial increase of downstream sedimentation, or introduction of contaminants (non-point source pollution) into the watershed.

Several projects included in the cumulative impacts analysis would alter the existing flood characteristics within the Otay River floodplain. As natural areas are converted to urban development, the acreage of impervious surfaces increases, which in turn increases the volume and velocity of urban runoff and decreases water quality. During construction, there is a potential for significant impacts, but these impacts would be avoided or minimized through the implementation of best management practices (BMPs) and mitigation measures proposed in Section 4.2.5, Hydrology and Water Quality. Potentially significant impacts to hydrology and water quality were identified as discussed in Section 4.2; however, with implementation of MM-HYD-1, MM-HYD-2, MM-HYD-3, and MM-HYD-4 all impacts would be reduced to a less than significant level. Following completion of the restoration, the restored wetlands would contribute beneficial impacts to regional water quality. As discussed in Section 4.2.2, Geology, Soils, and Agricultural Resources, analysis conducted for the project under both Alternative B and Alternative C indicates that with the incorporation of specific mitigation measures into the scope of the proposed action, the proposed changes associated with wetlands restoration would avoid exacerbating known flooding issues downstream of the project site or increasing potential impacts associated with scouring or erosion.

Additionally, with avoidance of contaminated soils on the eastern portion of the Otay River Floodplain Site and in the vicinity of the project site in the Otay River floodplain, significant impacts are not anticipated with either action alternative. With similar site-specific soils analysis and avoidance measures implemented for additional projects in the area, the proposed action would not result in a cumulative impact with respect to hydrology or water quality. Therefore, the proposed action under either Alternative B or Alternative C would not contribute to a cumulatively significant impact related to hydrology or water quality.

Air Quality

Cumulative air quality impacts are generally analyzed based on consistency with the local air quality plan for the basin in which the proposed action is located. For the San Diego Air Basin (SDAB), the Regional Air Quality Strategy (RAQS) serves as the long-term regional air quality planning document for the purpose of assessing cumulative emissions in the basin to ensure the SDAB continues to make progress toward National Ambient Air Quality Standards and California Ambient Air Quality Standards attainment status. As such, cumulative projects located in the San Diego region would have the potential to result in a cumulative impact to air quality if, in combination, they would conflict with or obstruct implementation of the RAQS. Similarly, individual projects that are inconsistent with the regional planning documents on which the RAQS

is based would have the potential to result in cumulative operational impacts if they represent development and population increases beyond regional projections.

The SDAB has been designated as a Federal nonattainment area for ozone (O_3) and a State nonattainment area for O_3, coarse particulate matter (particulate matter less than or equal to 10 microns in diameter; PM_{10}, and fine particulate matter (particulate matter less than or equal to 2.5 microns in diameter; $PM_{2.5}$). PM_{10} and $PM_{2.5}$ emissions associated with construction generally result in near-field impacts. The nonattainment status is the result of cumulative emissions from all sources of these air pollutants and their precursors within the basin. The emissions of all criteria pollutants for the proposed action would be below the "de minimis" thresholds, as analyzed in Section 4.2.6, Air Quality. Construction under the proposed action would be short term and temporary in nature. It is possible that other projects could be constructed in the same general time frame as the proposed action; however, analysis of cumulative emissions of volatile organic compounds (VOCs), carbon monoxide (CO), and sulfur oxides (SO_x) in terms of construction emission concentrations of these pollutants would be speculative due to variability in project construction schedules and mobile source trip routes. Additionally, background concentrations of these pollutants are typically very low relative to the California Ambient Air Quality Standards and National Ambient Air Quality Standards in the project site area because this area is not characterized by substantial urban activity that would otherwise result in higher ambient pollution concentrations. Regarding PM_{10}, $PM_{2.5}$, and NO_x, cumulative emissions of these pollutants would be temporary; would be primarily localized to the project site, particularly during site preparation and grading activities; and would not be emitted over long distances. During construction, each of the cumulative projects identified previously would be required to comply with San Diego Air Pollution Control District and California Air Resources Board rules regulating air quality. Moreover, as described in Section 4.5.2, Traffic, Circulation, and Parking, the proposed action's contribution to on-road passenger vehicle and road travel would not be substantial. Once construction is completed, construction-related emissions would cease. Therefore, the proposed action's minimal on-site and mobile emissions, when added to other projects in the vicinity, would not result in a cumulatively significant impact.

Regarding long-term cumulative operational emissions in relation to consistency with local air quality plans, the State Implementation Plan and RAQS serve as the primary air quality planning documents for the State and SDAB, respectively. The State Implementation Plan and RAQS rely on San Diego Association of Governments growth projections based on population, vehicle trends, and land use plans developed by the cities and the County as part of the development of their general plans. Therefore, projects that involve development that is consistent with the growth anticipated by local plans would be consistent with the State Implementation Plan and RAQS and would not be considered to result in cumulatively considerable impacts from operational emissions. As a restoration project, the proposed action would not result in the

generation of substantial vehicle trips or other operational-related air emissions that would contribute to a cumulative air quality impact, and thus would not result in significant regional growth that is not accounted for within the RAQS. As a result, the proposed action would not result in a cumulatively considerable contribution to regional criteria pollutant concentrations. Cumulative impacts would be less than significant.

Noise

Cumulative noise impacts would be considered significant if the incremental increases in noise generated during construction, along with noise from other existing or anticipated actions in the area, would exceed accepted noise standards for any sensitive receptors. Construction of the proposed restored wetlands under Alternatives B and C would cause a temporary increase in noise associated with the necessary operation of equipment and vehicles.. Potentially significant impacts to noise were identified as discussed in Section 4.2; however, with implementation of MM-NOI-1, all impacts would be reduced to a less than significant level. Once construction is complete, the ORERP under either action alternative would not result in an increase in ambient noise levels. Therefore, implementation of either Alternative B or Alternative C would not contribute to any permanent significant cumulative noise impacts.

Climate Change/Sea-Level Rise

Although the habitat types proposed under both Alternative B and Alternative C would be altered under the 2050 sea-level-rise scenario, neither action alternative would exacerbate the impacts of sea-level rise on adjacent development or native habitat. Further, the restored coastal wetlands would provide benefits related to climate change as a result of the amount of carbon that these wetlands would sequester over time. Overall, the implementation of either Alternative B or Alternative C would not result in significant cumulative adverse or beneficial impacts related to climate change or sea-level rise.

Greenhouse Gases

Due to the nature of assessment of greenhouse gas emissions and the impacts of global climate change, impacts can currently only be analyzed from a cumulative context; therefore, the analysis provided in Section 4.2.9, Greenhouse Gases, includes the analysis of both the proposed action and cumulative impacts. As outlined in detail in that section, the proposed action would not result in cumulatively significant greenhouse gas emissions.

Contaminants

As outlined in detail in Section 3.2.10, Contaminants, of this EIS, with avoidance of contaminated soils east of Nestor Creek within the Otay River Floodplain Site, and within the

general vicinity of both project sites, significant impacts are not anticipated with either action alternative. Potential impacts associated with implementation of various projects in the general vicinity of the site would not increase with the addition of the ORERP. Therefore, implementation of either Alternative B or Alternative C along with other projects identified within the cumulative study area would not result in a significant contribution to a cumulative impact associated with contaminants.

4.6.2.2 Cumulative Impacts to Biological Resources

Many of the projects being considered for implementation in the vicinity of the wetland restoration sites could result in disturbance to wildlife. Some of the uses proposed within the vicinity could also result in disturbance to wildlife if appropriate controls, such as seasonal restrictions, are not imposed. With the implementation of MM-BIO-1 through MM-BIO-11 outlined in Section 4.3, Biological Resources, the only permanent impacts from Alternative B (preferred alternative) and Alternative C would be beneficial impacts to habitat and vegetation, wildlife and fisheries, and endangered species. Therefore, even with potential impacts associated with the cumulative projects list, the proposed action would not result in a significant cumulative impact to biological resources.

Although the wetlands on the project site would be temporarily affected during construction under both Alternative B and Alternative C, these impacts would be more than offset by the ultimate restoration efforts under the proposed action. Therefore, implementation of either Alternative B or Alternative C would result in a net gain of wetland habitat within the San Diego Bay. This net gain in wetland habitat would be considered part of a cumulative net gain when considered with the other wetland restoration projects described above. See Section 4.3.1, Impacts on Habitat and Vegetation Communities, Including Jurisdictional Wetlands and Waters, for a discussion of impacts associated with conversion of non-wetland habitat and salt pond areas to tidal wetlands.

4.6.2.3 Cumulative Impacts to Cultural Resources

Cumulative significant impacts to cultural resources would occur if the proposed action combined with other past, present, and reasonably foreseeable actions resulted in changes to a cultural resource listed in or eligible for listing in the National Register of Historic Places, its landscape, or its setting that collectively could result in a loss of integrity. With adherence to MM-CUL-1 through MM-CUL-5 described in Section 4.4, Cultural Resources, of this EIS, no significant adverse cultural resources impacts are anticipated with implementation of either Alternative B or Alternative C. With similar mitigation measures implemented for the Otay River Floodplain Site, the Pond 15 Site, and associated project features under both alternatives, and due to the nature of impacts to cultural resources, the proposed action would not contribute to a cumulatively significant impact to cultural resources.

4.6.2.4 Cumulative Impacts to the Social and Economic Environment

Land Use

Cumulative impacts would be considered significant if the incremental direct or indirect impacts of the proposed action, when added to other related actions, would substantially alter the use or intensity of uses within the area. As discussed in Section 4.5.1, Land Use, the proposed wetland restoration as described under Alternative B and Alternative C would be consistent with all applicable planning documents and would not result in adverse land use impacts. Therefore, the implementation of either Alternative B or Alternative C is not anticipated to contribute to a cumulatively significant impact with regard to land use.

Traffic, Circulation, and Parking

Cumulative traffic impacts would be considered significant if traffic generated by the proposed action, combined with other past, present, and reasonably foreseeable actions, would result in substantial changes to current traffic volumes, congestion at major intersections, or changes in current roadway conditions. As discussed in Section 4.5.2, Traffic, Circulation, and Parking, once construction is complete, the restored wetlands under either Alternative B or Alternative C would create a minimal increase in traffic trips to the San Diego Bay NWR over the existing condition. Because minimal permanent trips would be added to area roadways, the proposed action would have no adverse or beneficial cumulative impact on the local or regional transportation system.

During construction under Alternative B or Alternative C, the total trips on area roadways would increase, particularly if material is transported from the Otay River Floodplain Site to the Pond 15 Site via the truck transport method. All affected roadways are currently operating below their design capacity. Through implementation of MM-TRA-1 and MM-TRA-2, all potential significant impacts would be reduced to less than significant during construction. There are currently no additional projects scheduled for construction in the immediate vicinity. The implementation of the Chula Vista Bayfront Master Plan is underway, but these projects are in the initial planning stages, and no timeline for construction has been identified. Thus, the construction schedules for other projects in the general vicinity are not likely to overlap with the construction timeline for the proposed action. As a result, implementation of either Alternative B or Alternative C is not anticipated to result in cumulatively significant adverse traffic impacts.

Public Utilities/Easements

Cumulative impacts would be considered significant if the proposed action would have the potential to incrementally affect public utilities and easements in the general vicinity of the proposed action. Construction access to the Otay River Floodplain Site would require the creation of a temporary construction access road that would likely travel along a portion of the

existing bike path east of the site boundary. Through standard construction design, inclusion of the exact locations of all utility lines on final construction documents, and implementation of MM-UTL-1, no damage or significant impact to utilities, utility service, or utility easements would result from the implementation of the action alternatives. Due to the nature of public utility and easement impacts, project impacts are mostly site specific. As noted under Traffic, Circulation, and Parking, there are currently no additional projects scheduled for construction that are in the immediate vicinity or that would impact the same utilities and easements. Therefore, no significant cumulative impacts are anticipated.

Public Access and Recreational Opportunities

Cumulative impacts would be considered significant if the impacts of the proposed action, combined with other past, present, and reasonably foreseeable actions, would substantially alter public access and/or recreational opportunities. Depending on the method of soil transport between the two non-contiguous portions of the project site, the Bayshore Bikeway and the bike path east of the Otay River Floodplain Site may have intermittent interruptions of access, but the bikeway would remain open during all construction activities. Although construction may affect access to both the Bayshore Bikeway and the path east of the Otay River Floodplain Site, these impacts would be temporary and mitigated through measures outlined in MM-REC-1 and MM-REC-2, including the use of a flagger to moderate recreational traffic in these areas during construction. In addition, as outlined under Traffic, Circulation, and Parking, there are currently no additional projects scheduled for construction in the immediate vicinity. Therefore, no temporary cumulative impacts are anticipated. Similarly to the proposed action, the projects within the cumulative study area would not permanently affect recreational facilities, and some would continue to beneficially enhance recreational facilities in the area. Therefore, cumulative impacts on public access and recreational opportunities in the area would be less than significant.

Vectors and Odors

Vectors

Cumulative impacts would be considered significant if the impacts of the proposed action combined with other past, present, and reasonably foreseeable future actions would substantially alter conditions that support mosquito breeding. Both action alternatives take into account the potential for vector production, and implementation of either Alternative B or Alternative C would ensure that the site would drain to avoid ponded water areas where mosquito breeding may increase. Additionally, although Alternative C would not drain the site completely, the proposed action under both alternatives would be designed to allow for continual tidal flow, turbidity, and non-stagnant hydrology such that conditions suitable for mosquito breeding would not readily occur. Moreover, the County Department of Environmental Health protects public health and safeguards environmental quality by regulating mosquito production and preventing

associated diseases carried by mosquitoes. With compliance with County Department of Environmental Health regulations, implementation of Alternative B or Alternative C along with other projects identified within the cumulative study area would not result in a significant contribution to a cumulative impact associated with vector management.

Odors

Cumulative impacts would be considered significant if the impacts of the proposed action, combined with other past, present, and reasonably foreseeable actions, would substantially alter conditions to increase odor generation. As described in Section 4.5.5, Vectors and Odors, the Otay River Floodplain Site would be graded to ensure that it would be inundated at high tide, with no pooling water during low tide. Additionally, the proposed action would increase tidal influence and water circulation in the area, which would reduce the likelihood of objectionable odors in the area. Grading during construction could expose decomposed materials, resulting in temporary objectionable odors. However, these odors would be alleviated through tidal circulation after the completion of construction. Area restoration projects in the cumulative project area would similarly decrease odors, with temporary impacts associated with grading and exposure of decomposed materials. As outlined under Traffic, Circulation, and Parking, there are currently no additional projects scheduled for construction in the immediate vicinity concurrent with the ORERP timeline. Therefore, no temporary cumulative impacts are anticipated, and the proposed action is not anticipated to contribute to cumulatively considerable effects from odors.

Economics/Employment

Cumulative impacts would be considered significant if the proposed action resulted in the incremental direct or indirect impacts on economic and employment opportunities. Both action alternatives would create temporary construction jobs. The restoration projects and other development projects outlined above would either benefit area economics or create job opportunities. With the implementation of MM-ECO-1, all potentially significant impacts to the salt works operation would be minimized. Therefore, the proposed action would not cumulatively contribute to a significant adverse or beneficial impact related to economics or employment.

Environmental Justice

Cumulative environmental impacts would be considered significant if the proposed action would result in incremental direct or indirect impacts to undiversified communities. No significant impacts are anticipated as a result of implementation of Alternative B or Alternative C that would result in disproportionate adverse human health impacts or environmental impacts to any low-income or minority populations in the areas surrounding the project site. Similarly, the cumulatively considered projects in the area are not anticipated to disproportionately affect low-income or minority communities. Therefore, no cumulatively considerable impacts to low-income or minority communities would be anticipated.