4. CUMULATIVE IMPACTS

4.1 Introduction

For the purposes of this Environmental Impact Report (EIR), cumulative effects would be significant if the incremental effect of Phase 2 of the South Bay Salt Pond (SBSP) Restoration Project at Eden Landing, though individually limited, is cumulatively considerable when viewed in connection with the effects of past, current, and probable future projects (CEQA Guidelines 15064[h][1]). National Environmental Policy Act (NEPA) provides a similar definition of cumulative impacts. NEPA regulations (40 Code of Federal Regulations [CFR] 1508.7) define a cumulative impact as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor collectively significant actions taking place over a period of time."

This EIR provides a project-level evaluation and analysis of the SBSP Restoration Project, Phase 2 at the southern Eden Landing ponds. The 2007 SBSP Restoration Project Final Environmental Impact Statement/Report (2007 Final EIS/R), which was both a programmatic and a Phase 1 level document, analyzed the larger, program-wide details of the SBSP Restoration Project. Where feasible and appropriate, this EIR uses information and analysis from the 2007 Final EIS/R for analysis of the project-level impacts of Eden Landing Phase 2.

The 2007 Final EIS/R evaluated a program-level No Action Alternative[1] and two program-level Action Alternatives for restoring or enhancing the former salt ponds in the SBSP Restoration Project area. The two Action Alternatives established a set of "bookends" for the long-term project goals. Under these bookends, Programmatic Alternative B would work toward a gradual restoration of 50 percent of the total project acreage being restored to tidal marsh. The other 50 percent would be maintained or improved to enhanced managed ponds. Programmatic Alternative C would continue past the 50 percent tidal marsh goal and end in 90 percent of the total project area being restored to tidal marsh, leaving only 10 percent in enhanced managed ponds. Programmatic Alternative A is the alternative under which no actions would have been taken (the No Action Alternative).

The 2007 Final EIS/R evaluated the environmental impacts of these programmatic alternatives and found that Programmatic Alternative A would not meet the project purpose and need of restoring tidal marshes in South San Francisco Bay (South Bay). The 2007 Final EIS/R selected Programmatic Alternative C, because the SBSP Restoration Project would need many years and multiple project-level phases to even approach the 50 percent tidal marsh goal of Programmatic Alternative B. As that level of tidal marsh restoration was being approached, the Project Management Team and other stakeholders would use the findings of the Adaptive Management Plan (AMP) and the directed scientific research questions to determine whether to stop at the 50 percent tidal marsh goal or continue progress toward the 90 percent goal or some other percentage between those bookends.

The Eden Landing Phase 2 project alternatives evaluated in this EIR would advance the program-level goals of both Programmatic Alternatives B and C. Completing Phase 2 would move the larger project

[1] "No Action Alternative" is the NEPA term. It corresponds to the CEQA term "No Project Alternative." This EIR uses No Action throughout.

closer to the 50 percent tidal marsh/50 percent managed ponds goal of Alternative B, but it would not reach it. Thus, completing Phase 2 would still allow the project to cease restoration activities at some point between the bookends of Programmatic Alternatives B and C.

4.2 Cumulative Setting

The 2007 Final EIS/R analysis of cumulative impacts was prepared from a list of past, current, and probable future projects that could result in similar impacts and benefits as those of the SBSP Restoration Project. Regional plans were also reviewed to characterize development trends and growth projections in the South Bay over the long-term planning period, which the 2007 Final EIS/R set at 50 years. These projects are considered in the cumulative impact discussion, together with the SBSP Restoration Project, to determine if the combined effects of all of the projects would be cumulatively considerable and thus would result in significant cumulative impacts. This EIR expands on that cumulative setting by reviewing additional general and regional plans and considering other reasonably foreseeable projects envisioned since the 2007 Final EIS/R was adopted.

4.2.1 General and Regional Plans

Plan Bay Area

Plan Bay Area is a long-range integrated transportation and land-use/housing strategy through 2040 for the San Francisco Bay (or Bay) Area. On July 18, 2013, the plan was jointly approved by the Association of Bay Area Governments Executive Board and the Metropolitan Transportation Commission (MTC). The plan includes the region's Sustainable Communities Strategy and the 2040 Regional Transportation Plan and represents the next iteration of a planning process that has been in place for decades.

Plan Bay Area marks the nine-county region's first long-range plan to meet the requirements of California's landmark 2008 Senate Bill 375, which calls on each of the state's 18 metropolitan areas to develop a Sustainable Communities Strategy to accommodate future population growth and reduce greenhouse gas (GHG) emissions from cars and light trucks. Working in collaboration with cities and counties, the Plan Bay Area advances initiatives to expand housing and transportation choices, create healthier communities, and build a stronger regional economy.

San Francisco Bay Plan—San Francisco Bay Conservation and Development Commission

The McAteer-Petris Act (Cal. Govt. Code Sections 66600–66694) is the California state law that established the San Francisco Bay Conservation and Development Commission (BCDC) as a state agency; prescribes BCDC's powers, responsibilities, and structure; and describes the broad policies BCDC must use to determine whether permits can be issued for activities in and along the shoreline of San Francisco Bay. BCDC's jurisdiction, regulations, and plans are described in Section 3.5, Biological Resources; Section 3.6, Recreation Resources; and Section 3.16, Visual Resources.

Alameda County General Plan

The Eden Landing Phase 2 project area is designated as Open Space in the Alameda County General Plan. The Alameda County General Plan, adopted in 1973, does not include a Land Use Element, and instead incorporates land use elements from each city General Plans and unincorporated area specific plans.

However, policies applicable to the Salt Ponds are discussed in the May 4, 1995 Amended Open Space Element and are described as follows:

Shoreline and Bay Open Space - Principles for Shoreline and Bay Open Space

- Preserve Natural Ecological Habitats in Shoreline Areas: Outstanding natural ecological habitats in shoreline areas of the County should be designated for protection and maintenance as wildlife preserves as a means of protecting marine and wildlife and to permit ecological studies; and
- Provide for Orderly Transition of Phased out Salt Extraction Areas to Uses Compatible with the Open Space Plan: Salt extraction areas, which will be operative through the plan period, should be designated as permanent open space. Areas that will not be active through the plan period should be phased out according to a planned program in such a manner as to maintain salt production cycles. Phased out areas should be converted to uses permitted within waterfront open spaces such as wildlife refuges or recreation areas. No filling of salt extraction areas should be permitted except for recreation purposes in selected areas as indicated on adopted local or regional plans (Alameda County 1995).

City of Fremont General Plan

The City of Fremont General Plan was adopted in December 2011. The City is divided into planning areas, one of which is the Baylands Planning Area which includes lands under the Bay, salt ponds, wetlands, seasonal wetlands, and other uses associated with the Bay and wildlife habitat.

The goals, policies and implementation measures contained in the Open Space Element related to salt ponds include the following (City of Fremont 2011):

- Goal 2-6: Open Space. An open space "frame" around Fremont, complemented by local parks and natural areas, which together protect the City's natural resources, provide opportunities for recreation, enhance visual beauty, and shape the City's character.

Policy 2-6.3: Baylands. Manage Fremont's Baylands as permanent open space. The habitat and ecological value of these areas should be conserved and restored to the greatest extent possible… Planning for the baylands should consider the effects of climate change and sea level rise.

City of Hayward General Plan

The Hayward 2040 General Plan was adopted on July 1, 2014 (City of Hayward 2014). No land use policies make specific reference to the SBSPs; however, the Land Use element of the General Plan recognizes that Baylands (*e.g.,* Marshes and Salt Ponds) comprise nine square miles within Hayward. The Hayward 2040 General Plan Land Use Diagram identifies the pond complex as Baylands (City of Hayward 2014).

The Natural Resources Element of the Hayward 2040 General Plan includes the following goal concerning the baylands (*e.g.* Marshes and Salt Ponds) (City of Hayward 2014):

- Goal NR-3: Preserve, enhance, and expand natural baylands, wetlands, marshes, hillsides, and unique ecosystems within the Planning Area in order to protect their natural ecology, establish the physical setting of the city, provide recreational opportunities, and assist with improved air quality and carbon dioxide sequestration.

Union City General Plan

The 2002 General Plan Policy Document was adopted in 2002 (City of Union City 2002). No land use policies make specific reference to the SBSP Restoration Project or the Reserve.

The eastern edge of the Eden Landing pond complex is directly adjacent to Union City. The majority of the land within the Union City limits is zoned for Open Space. The Open Space designation is described as follows in the Union City General Plan Land Use Element:

- The purpose of this [Open Space] designation is to conserve lands that should remain as open space for passive and active recreation uses, resource management, flood control management and public safety. Uses that would typically be appropriate in this land use designation include but are not limited to public parks, playgrounds, golf courses and driving ranges, parkways, vista areas, wetlands, wildlife habitats and outdoor nature laboratories; stormwater management facilities; and buffer zones separating urban development and ecologically sensitive resources (p. LU-7) (City of Union City 2002).

However, some land abutting the complex is zoned Civic Facility and Special Industrial. The Civic Facility designation is applied to:

- …the City's major public buildings and facilities owned by City, County, state, federal or other public agencies that serve the general public. Uses include but are not limited to wastewater treatment facilities, water tanks, electrical substations, public educational facilities, community centers, libraries, museums, government offices and courts (*e.g.*, Civic Center), transit facilities and stations, and public safety facilities (*e.g.*, police and fire stations) (p. LU-7).

The Special Industrial designation provides:

- (s)pace for the lightest industrial operations and non-manufacturing uses that support nearby manufacturing that exhibit virtually no nuisance characteristics. Non-manufacturing uses include educational, administrative, sales and service activities. This designation provides for a smaller scale of uses, on smaller sites than would typically be found in Light Industrial designated areas. In Special Industrial designated areas, nuisance characteristics of noise, odor, traffic generation, unsightliness or hazardous materials storage or handling are avoided, and almost all uses will be conducted entirely within enclosed buildings (p. LU-6).

The Special Industrial designation typically includes small scale, high quality industrial park developments and is often applied as a buffer adjacent to major thoroughfares where large landscaped setbacks are provided and as a transition area between higher intensity industrial uses and other lower intensity uses. Performance standards are applied to eliminate, or minimize to the extent reasonably possible, any potential for adverse effects (City of Union City 2002).

4.2.2 Cumulative Projects

Table 4-1 lists recently completed past projects, projects currently under construction, and probable future projects that would overlap with project construction and/or operation and that could impact the same resources. This table provides a brief description of the projects included in the cumulative impact analysis, their locations, their estimated construction schedules, related major roadways and waterways, and the potential cumulative impacts that could occur in combination with those of the proposed project.

Table 4-1 Projects Considered in Cumulative Impacts Analysis for the South Bay Salt Pond Restoration Project

PROJECT	PROJECT DESCRIPTION	LOCATION	PROJECT PHASE	RELATED MAJOR ACCESS ROADS	RELATED WATERWAYS	POTENTIAL CUMULATIVE IMPACT ISSUES	CUMULATIVE IMPACT CONTRIBUTION
Ongoing Mosquito Abatement Projects							
Alameda County Mosquito Control	The county's mosquito control agency treats tidal pools and salt marshes during high tide with a larvacide to reduce mosquito populations.	Alameda County	Ongoing	I-880	Coyote Creek, Alviso Slough	Public health and vector management	No considerable contribution; project is considered in baseline analysis
Restoration Projects							
San Francisco Estuary Invasive Spartina Project	The Invasive Spartina Project has been implementing a coordinated, region-wide eradication program comprising a number of on-the-ground treatment techniques to stave off the invasion of non-native invasive cordgrasses (Spartina alterniflora and its hybrids and S. densiflora, S. patens, and S. anglica). The project is focused within the nearly 40,000 acres of tidal marsh and 29,000 acres of tidal flats that constitute the shoreline areas of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano, Sonoma, and Sacramento Counties.	Bay Area	Ongoing	Not applicable (NA)	San Francisco Bay	Hydrology, flood management, and infrastructure; water quality and sediment; biological resources; cultural resources	No considerable contribution; project is considered in baseline analysis
Shoreline Study	The study assesses the need for flood protection in the South Bay, extends along South Bay and includes the three pond complexes within the SBSP Restoration Project area as well as shoreline and floodplain areas in Alameda, San Mateo, and Santa Clara Counties.	South Bay	Ongoing	I-880, SR 237, U.S. 101	Coyote Creek; Mud, Alviso, and Guadalupe Sloughs	Hydrology, flood management, and infrastructure; water quality and sediment; geology, soils, and seismicity; biological resources; recreation resources; cultural resources	No considerable contribution; project is considered in baseline analysis
Final Damage Assessment and Restoration Plan for the November 7, 2007 Cosco Busan Oil Spill	Under the Oil Pollution Act of 1990, the Natural Resource Trustees prepared the Damage Assessment and Restoration Plan/Environmental Assessment (DARP/EA) to assess injuries and evaluate restoration alternatives for natural resources injured by the Cosco Busan Oil Spill. The DARP/EA describes multiple restoration actions to benefit natural resources and compensate for loss of recreation services, including wildlife habitat projects, eelgrass restoration, sandy beach and salt marsh/mudflat habitat restoration, and recreation/human use projects.	San Francisco Bay Area	Ongoing	NA	San Francisco Bay Area, all ponds	Hydrology, flood management, and infrastructure; water quality and sediment; biological resources; recreation resources	Project could contribute to cumulative impacts
Joint Lower Alameda Creek Fish Passage Improvements	Alameda County Water District's (ACWD) and Alameda County Flood Control and Water Conservation District's (ACFCWCD) Joint Lower Alameda Creek Fish Passage Improvements include (1) the construction of a new fishway at ACWD's Rubber Dam 1 and ACFCWCD's drop structure; (2) the construction of a new fishway at ACWD's Rubber Dam 3 and the replacement of existing Rubber Dam 3 material, equipment and controls with new materials; (3) the replacement of existing Rubber Dam 1 equipment and controls with new materials; and (4) construction of new Shinn diversion and fish screening facility and decommissioning the existing unscreened diversion pipelines.	City of Fremont	Planning	SR-238	Alameda Creek	Hydrology, flood management, and infrastructure; water quality and sediment; biological resources	Project could contribute to cumulative impacts
Kaiser Fish Screen Project	The project involves construction of a new diversion pipeline and cylindrical fish screen to abandon the existing unscreened pipeline. The replacement facility will be constructed about 530 feet downstream of the existing diversion pipe and 2,400 feet upstream of Alameda County Water District's (ACWD's) Rubber Dam 1, where the Union Pacific Railroad (UPRR) and San Francisco Bay Area Rapid Transit District (BART) bridges cross over Alameda Creek.	City of Fremont	Completed	I-880	Alameda Creek	Hydrology, flood management, and infrastructure; water quality and sediment; biological resources; cultural resources	No considerable contribution; project is completed

Table 4-1 Projects Considered in Cumulative Impacts Analysis for the South Bay Salt Pond Restoration Project

PROJECT	PROJECT DESCRIPTION	LOCATION	PROJECT PHASE	RELATED MAJOR ACCESS ROADS	RELATED WATERWAYS	POTENTIAL CUMULATIVE IMPACT ISSUES	CUMULATIVE IMPACT CONTRIBUTION
Water Resources Projects							
Maintenance Dredging of the Federal Navigation Channels in San Francisco Bay, Fiscal Years 2015–2024	Operation and maintenance dredging to remove sediment to authorized depths to fulfill the USACE's Navigation Mission to provide safe, reliable, and efficient waterborne transportation systems (channels, harbors, and waterways) for the movement of commerce, national security needs, and recreation.	San Francisco Bay Area	Ongoing	NA	San Francisco Bay	Hydrology, flood management, and infrastructure; water quality and sediment; biological resources; recreation resources	Project could contribute to cumulative impacts
Old Canyon Road Bridge Foundation Protection Repair Project	This project would remove grouted rock rip-rap and install rock riprap and cobble in the creek channel to stabilize the bridge footings.	City of Fremont	Planning	SR-84	Alameda Creek	Hydrology, water quality, and flood management	Project could contribute to cumulative impacts
San Francisco Public Utilities Commission's (SFPUC) Water System Improvement Project (WSIP)	The SFPUC proposes to adopt and implement WSIP to increase the reliability of the regional water system, which provides drinking water to 2.4 million people in San Francisco, San Mateo, Santa Clara, Alameda, and Tuolumne Counties. The WSIP is a program to implement the service goals and system performance objectives established by the SFPUC for the regional water system in the areas of water quality, seismic reliability, delivery reliability, and water supply through the year 2030.	San Francisco Bay	Ongoing	NA	San Francisco Bay	Water quality and sediment; geology, soils, and seismicity; utilities	Project could contribute to cumulative impacts
South Bay Advanced Recycled Water Treatment Facility (ARWTF) Project	The ARWTF treats up to 10 million gallons per day of secondary effluent from the San Jose/Santa Clara Water Pollution Control Plant (WPCP) with advanced tertiary treatment and blends the high-purity effluent with tertiary effluent from the San Jose/Santa Clara WPCP for use in the South Bay Water Recycling system.	City of San Jose	Ongoing	SR 237	San Francisco Bay, Coyote Creek, Guadalupe Creek	Hydrology, flood management, and infrastructure; water quality and sediment; biological resources; utilities	Project could contribute to cumulative impacts
City of Hayward Recycled Water Project	The project would install a new recycled water facility at the city's treatment plant. The new recycled water facility would deliver 290 acre feet per year of recycled water to 22 customers for irrigation and industrial use. The project also includes construction of a 1 million gallon storage tank, pump station, and 10 miles of pipelines including installation of customer connections to distribute tertiary treated recycled water to irrigation and industrial customers.	City of Hayward	Planning	I-580	NA	Water resources, effects to the City's storm drain system	Project could contribute to cumulative impacts
Development Projects							
Turk Island Landfill Consolidation and Residential Subdivision	The project proposes removal of landfill debris from the 6.3 acre site at Westport Way and Carmel Way in Union City and depositing of debris onto the adjacent Turk Island Landfill followed by backfill of clean soil onto the site and development of a 33 unit single family detached residential subdivision. Improvements to the adjacent Sea Breeze Park are also proposed as a part of the project.	City of Union City	Planning	I-880. SR-84, Carmel Way, and Westport Way	San Francisco Bay, Alameda Creek	Hydrology, water quality, flood management, and recreation resources	Project could contribute to cumulative impacts
Lincoln Landing	Project is a large-scale mixed-use development consisting of 476 multi-family residential units above 80,500 square feet of commercial uses with a combination of surface and structured. The existing 335,000-square-foot office building and 5,310-square-foot commercial building would be demolished to accommodate the project.	City of Hayward	Planning	I-238, I-880, I-580	San Lorenzo Creek	Traffic, effects to the City's storm drain system and San Lorenzo Creek	Project could contribute to cumulative impacts
Maple & Main Mixed-use Residential Project	The applicant proposes to demolish all buildings on the project site except the medical office building on the corner of Maple Court and McKeever Avenue, and construct a residential building. The new residential building would include 240 rental apartments, ground floor retail and a leasing office.	City of Hayward	Planning	I-238, I-880, I-580	San Lorenzo Creek	Traffic, effects to the City's storm drain system and San Lorenzo Creek	Project could contribute to cumulative impacts

Table 4-1 Projects Considered in Cumulative Impacts Analysis for the South Bay Salt Pond Restoration Project

PROJECT	PROJECT DESCRIPTION	LOCATION	PROJECT PHASE	RELATED MAJOR ACCESS ROADS	RELATED WATERWAYS	POTENTIAL CUMULATIVE IMPACT ISSUES	CUMULATIVE IMPACT CONTRIBUTION
Fairview Orchards & Fairview Meadows Residential Subdivision	Project proposes to subdivide two parcels equaling 9.78 acres into 31 single family residential lots.	City of Hayward	Planning	I-580, SR-238	San Lorenzo Creek	Effects to the City's storm drain system and San Lorenzo Creek	Project could contribute to cumulative impacts
Niles Mixed-Use Project	The project applicant (Valley Oak Partners, LLC) is proposing to develop 98 dwelling units and 3,620 square feet of non-residential uses	City of Fremont	Planning	SR-84	Alameda Creek	Effects to the City's storm drain system and Alameda Creek	Project could contribute to cumulative impacts
Industrial Projects							
U.S. Pipe and Foundry Retention Basin Project	U.S. Pipe and Foundry Company, LLC, is proposing to develop a stormwater retention basin on its industrial property at 1295 Whipple Road, an iron smelting facility and ductile iron pipe manufacturing plant. The purpose of the retention basin is to capture and retain stormwater runoff from the plant property so as to reduce or prevent the discharge of pollutants via stormwater into downstream waters.	City of Union City	Planning	I-880, SR-258	Alameda Creek	Water quality	Project could contribute to cumulative impacts
Transportation Projects							
Transportation 2035 Plan for the San Francisco Bay Area	The proposed Transportation 2035 Plan is the Bay Area's long-range regional transportation plan; it lays out the transportation policies and projects to address the mobility, accessibility, and performance needs of the region through the 2035 planning horizon.	San Francisco Bay Area	Ongoing	NA	None	Recreation resources, traffic, air quality, greenhouse gas emissions	Project could contribute to cumulative impacts
Route 262/Warren Avenue/I-880 Interchange Reconstruction and I-880 Widening	Improve the interchange at SR 84 and Palomares Road, and realign the intersection. Roadway improvements, including bridge replacement and High Occupancy Vehicle lanes in each direction on a portion of I-880 and SR 262 in and near the cities of Milpitas and Fremont.	City of Fremont	Ongoing	I-880	Coyote Creek	Traffic, air quality, greenhouse gas emissions	Project could contribute to cumulative impacts
Pacific Gas and Electric Company (PG&E) NERC Compliance Efforts	The Federal Energy Regulatory Commission grants the North American Electric Reliability Corporation (NERC) the legal authority to establish and enforce reliability standards for the bulk-power system. PG&E's efforts to comply with NERC have included the upgrading of many of PG&E's overhead transmission systems to meet the requirements of NERC.	San Francisco Bay	Ongoing	NA	NA	Hydrology, flood management, and infrastructure; water quality and sediment; geology, soils, and seismicity; biological resources; cultural resources; visual resources	Project could contribute to cumulative impacts
Recreation Projects							
San Francisco Bay Area Water Trail Plan	The plan provides recommendations and guidance for a network of landing and launching sites at various locations on the margins of San Francisco Bay and its tributaries. Water Trail access is being considered for at least 112 locations. The plan would also increase use of San Francisco Bay by non-motorized small boats.	San Francisco Bay	Ongoing	NA	None	Recreation resources	Project could contribute to cumulative impacts

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For future projects, the analysis was based on estimated construction schedules. Where construction schedules were unavailable, it was conservatively assumed that construction periods would overlap with the project, which would be constructed during the dry season over 3 years from 2016 to 2019.

To gather relevant projects, projects and plans for the cities of Fremont, Hayward and Union City and the county plan for Alameda. Only those projects or plans far enough along in the development stage to assess their potential contribution to cumulative impacts were included in this analysis.

4.3 Cumulative Impacts and Mitigation Measures

This section evaluates the potential environmental impacts of the proposed project when considered together with other projects. The analysis addresses only the types of impacts that could occur as a result of project construction and operation, based on the significance criteria provided for each resource discussion in Chapter 3, Environmental Setting, Impacts, and Mitigation Measures.

The project's potential to adversely contribute to cumulative air quality, greenhouse gas emissions, traffic, noise, and recreation resources impacts would occur primarily during construction. Operational cumulative impacts could occur to biological resources; hydrology, flood management, and infrastructure; water quality and sediment; and public health and vector control.

The analysis of cumulative impacts followed a multi-step approach. First, an evaluation was made as to whether a significant cumulative impact existed within each relevant study area for the impact under consideration. This evaluation was made by reviewing the conclusions of the No Action Alternative in the "Cumulative Impacts" section of the 2007 Final EIS/R. Then those conclusions were re-examined based on the updated cumulative project information presented in Table 4-1. Next, the Eden Landing Phase 2 project impacts were evaluated as to whether they, in combination with impacts from the other projects, would create a new significant cumulative impact. If so, then a potentially significant impact was found, and mitigation measures from Chapter 3, Environmental Setting, Impacts, and Mitigation Measures, were identified and included to reduce this impact to a less-than-significant level. In cases where a significant cumulative impact already exists, even without the SBSP Restoration Project, the Eden Landing Phase 2 project's impacts were examined to determine if they would make a considerable contribution to that impact. If it was determined that the Eden Landing Phase 2 project impacts would not make a considerable contribution to a significant cumulative impact, the impacts were determined to be less than significant.

If an Eden Landing Phase 2 project impact were to have a considerable contribution to a cumulative impact, then mitigation from the project impact analysis in Chapter 3 would be proposed to reduce the project's contribution to cumulative impacts to a level that is less than considerable. However, no considerable contributions to a cumulative impact were found. In contrast to this approach, the 2007 Final EIS/R determined that if a significant cumulative impact existed even without the project, the project cumulative impact was deemed significant regardless of the project's contribution to that impact.

4.3.1 Hydrology, Flood Management, and Infrastructure

The geographic scope for the cumulative impacts analysis for hydrology, flood management, and related infrastructure encompasses the creeks, sloughs, and other waterways within the project area that feed into South Bay. These waterways include Old Alameda Creek (OAC) and the Alameda Creek Flood Control Channel (ACFCC), and to a lesser extent the southern end of North Creek at its confluence with OAC, which is just outside of Pond E1.

The types of projects listed in Table 4-1 that could contribute to cumulative impacts associated with hydrology, flood management, and infrastructure include restoration projects, flood risk management projects, and some transportation projects (e.g., bridge replacements). Review of the 2007 Final EIS/R and the cumulative projects listed in Table 4-1 indicates that less-than-significant or beneficial cumulative impacts exist in the study area associated with hydrology, flood management, and infrastructure in the project area.

Cumulative Impacts of No Action Alternative

No new activities would occur under the Eden Landing Phase 2 No Action Alternative and southern Eden Landing would continue to be monitored and managed through the activities described in the AMP and in accordance with current California Department of Fish and Wildlife (CDFW) practices.

Under the No Action Alternative, some of the levees around the Eden Landing Phase 2 project area are high-priority levees, to be maintained for inland de facto flood protection. These levees would be maintained (or repaired after unexpected failure) by CDFW and/or by the Alameda County Flood Control and Water Conservation District (ACFCWCD), depending on the levees in questions. Because the existing levels of de facto flood protection would be maintained and adaptive management would be used to actively monitor and assess flood risk management measures, impacts to flood risk management under the No Action Alternative would be less than significant.

The existing pond operations and filling-and-draining patterns would be maintained. Some ponds would be operated to allow extremely muted tidal exchange; others would be managed to be seasonally dried for different wildlife species. The potential for erosion from water circulating within the ponds and accretion rates within the ponds would be minimal because some ponds are not operated to receive tidal flows and because flows are mediated through tide gates or other engineered water control structures. The Eden Landing Phase 2 project area currently contains few navigable sloughs and waterways—the major sloughs have silted in over a period of decades, reducing navigability. At low tide, navigation into or out of shallow sloughs can be problematic. Small craft (e.g., kayaks) are more amenable to the shallow water environments and are more likely to navigate tidal sloughs.

Under the No Action Alternative, no new improvements to existing levees would occur. Some existing levees would be maintained. As such, no additional maintenance (beyond that described above) to repair or improve portions of levees for increased performance during a tsunami and/or seiche would occur under. However, because no habitable structures would be constructed and warning systems would allow for evacuation of the shoreline in such an event, inundation by tsunamis or seiches would not expose people to potential injury or death.

As discussed above, no significant cumulative impacts associated with hydrology, flood management, and infrastructure exist in the project area. The Eden Landing Phase 2 No Action Alternative would cause less than significant hydrology impacts. Existing levels of de facto flood protection would be maintained and adaptive management would be used to actively monitor and assess flood risk management measures. No habitable structures would be constructed and warning systems would allow for evacuation of the shoreline during a tsunami. There would not be a significant cumulative hydrology impact caused by the Eden Landing Phase 2 No Action Alternative.

Cumulative Impacts of Eden Landing Phase 2 Action Alternatives

Under the Eden Landing Phase 2 Action Alternatives, some or all of the ponds at southern Eden Landing would be breached or otherwise connected to tidal flows to enable sediment accretion, support hydraulic connectivity, alter circulation patterns, and increase habitat complexity. Increases in sediment accumulation and/or sediment distribution in the ponds could help achieve a future flood risk management goal of ensuring that the rate of sediment accretion and marsh development keeps pace with expected future sea-level rise.

More specifically, at the Bay Ponds in all Action Alternatives and at the Inland Ponds and Southern Ponds in Alternative Eden B, tidal flows would be introduced through new breaches. In Alternatives Eden C and Eden D, water control structures would instead allow controlled flows to the Inland Ponds and the Southern Ponds. Sediment accretion would begin after breaching, and some erosion of the adjacent mudflats would be expected, though observations of changes in mudflats following the Phase 1 actions indicate that mudflat losses have been less than initially expected and that mudflats area has increased in some locations.

All of these changes would require at least some levee improvements to ensure that the existing levels of de facto flood protection are retained or improved. The Eden Landing Phase 2 designs include several improvements to existing levees and berms to maintain or enhance the levels of flood risk management currently provided by the former salt ponds and other flood risk management infrastructure. Monitoring and adaptive management would be used at all areas to verify that the Phase 2 actions are performing as intended and to modify or correct those that aren't. Changes to coastal and fluvial flood risk would be minimal for the above-mentioned reasons, and therefore the impacts would be less than significant.

Habitat transition zones would be constructed in all of the Eden Landing Phase 2 Action Alternatives, but the location of the zone would vary by alternative. These habitat transition zones would perform several functions: adding some flood risk management, buffering against sea-level rise, and adding transitional wildlife habitat. Because adaptive management would be used to actively monitor and assess flood risk management measures and existing levels of de facto flood protection would be maintained, impacts to flood risk management would be less than significant.

Under the Eden Landing Phase 2 Action Alternatives, drainage patterns within some ponds would change because they would be breached and because pilot channels would be created to make the filling and draining more efficient and complete within each tidal cycle. Sediment would accrete, and marsh channels in portions of the ponds would develop, increasing habitat complexity. The new breaches and the marsh channels would be affected by tidal scour. Levee breaches would increase tidal flows in the sloughs downstream of the breaches, widening and deepening the sloughs over time. Slough width and depths upstream of the breaches would be less affected by levee breaching.

The long-term regional sediment supply in the far South Bay has been studied by Shellenbarger et al. (2013) for the SBSP Restoration Project area. It is estimated that between 29 and 45 million cubic meters of sediment would be required to raise all of the SBSP Restoration Project area to mean tidal level. Sediment influx from the South Bay (north of the Dumbarton Bridge) would supply this amount of sediment in about 90 to 600 years.[2] This estimate reflects the long-term regional sediment supply

[2] These data are based on using water year 2009 and 2010 sediment budget results. Also, Programmatic Alterative C, analyzed in the 2007 Final EIS/R, had an upper range of 90 percent tidal restoration, not 100 percent tidal restoration.

assuming that there is no net loss of mudflats and marshes in the area and that the volume of sediment needed in the ponds does not change due to sea-level rise or construction. However, some of the subsided ponds would be maintained as managed ponds and not restored to tidal action and the bottom elevations of some ponds would be raised through beneficial reuse of dredge materials, so the SBSP Restoration Project as a whole, and Eden Landing Phase 2 in particular, would require less sediment than the estimate provided here. Furthermore, to meet the sediment deficit without overly scouring mudflats, restoration is being phased over many decades to match sediment demand with the rate at which sediment naturally enters the far South Bay, and ponds may be partially filled with clean dredged sediments and/or upland material to reduce their demand.

The Eden Landing Phase 2 Action Alternatives would not result in significant adverse impacts to navigation. Over a period of years, some sloughs are expected to scour, increasing channel dimensions. Larger channel cross-sectional areas would reduce the short-term velocity increases associated with the breaches and provide improved navigation in the long term.

The Eden Landing Phase 2 Action Alternatives would not include construction of habitable structures. Also, existing warning systems (e.g., the National Weather Service) would allow for evacuation of the shoreline during a tsunami or seiche, so inundation by tsunamis or seiches would not expose people to potential injury or death.

As discussed above, no significant cumulative impacts associated with hydrology, flood management, and infrastructure exist in the project area. The Eden Landing Phase 2 Action Alternatives would cause less than significant hydrology impacts. Changes to coastal and fluvial flood risk would be minimal and existing levels of de facto flood protection would be maintained. Minor tidal scour and mudflat erosion could occur from breaching of levees but these effects would be monitored through the AMP and corrective actions would be implemented if performance metrics are not met. The magnitude of the impacts is so small relative to the background dynamics in the existing environment that there would not be a significant cumulative hydrology impact caused by the Eden Landing Phase 2 Action Alternatives.

4.3.2 Water Quality

The former salt ponds are at the interface between the urban environment and San Francisco Bay. The geographic scope for water quality cumulative impacts includes the South Bay itself, the SBSP Restoration Project pond complexes, and the lower, adjacent portions of upland watershed areas.

The types of projects listed in Table 4-1 that could contribute to cumulative impacts associated with water quality include restoration projects, flood protection projects, and development projects. Review of the 2007 Final EIS/R and the cumulative projects listed in Table 4-1 indicates that potentially significant cumulative impacts relative to water quality exist in the study region. Restoration of salt ponds to tidal marsh habitat has the potential to increase phytoplankton (algae) abundance and composition as levees are breached. Phytoplankton abundance could increase as a result of biostimulation due to increased light penetration as sediment accretion creates localized areas of low turbidity outside of breached levees. Other cumulative tidal habitat restoration projects have the potential to cause similar impacts. Risk factors that could cause increased algal abundance are biostimulation due to excessive nutrients or increased water transparency. One risk factor that could cause changes in phytoplankton composition is the opening of new breaches between ponds and Bay waters, thereby introducing new or exotic algal species. Another risk factor is the release of substances toxic to algae from urban runoff, herbicide application, and other sources, thereby selecting for species more resistant to toxicants. Project activities (proposed by the SBSP

Restoration Project or by the cumulative projects) that are likely to cause one or more of these risk factors would result in a potentially significant impact.

Some of the cumulative projects would have potentially significant impacts when considering the long-term cumulative impacts of discharge of biological oxygen demand and/or chemical oxygen demand into the Bay, because they would involve opening breaches between ponds and the Bay. Without appropriate adaptive management, it is assumed that other cumulative projects would have potentially significant impacts.

Mobilization and transport of mercury-contaminated sediments is a regional issue that is regulated by the Bay Total Maximum Daily Load (TMDL) requirement to drive down the inventory of mercury in the actively resuspended sediment layer. The risk factors for mobilization and transport of mercury-contaminated sediments would come from projects that would involve substantial earthmoving and dredging activities or that would enhance tidal scour and that are near known or suspected sources of mercury-contaminated sediments. Some of the cumulative projects would have impacts when considering the long-term cumulative impacts of mobilization and transport of mercury-contaminated sediments and do not as yet have well-defined AMPs and therefore have potentially significant impacts. On balance, the cumulative impacts of other cumulative projects would be potentially significant.

Some cumulative projects would result in a potential increase in net methylmercury production and bioaccumulation and were deemed to have potentially significant impacts because they do not include an AMP, or the monitoring tools and adaptive management actions for those projects have not yet been defined. For the purposes of this analysis, it is assumed that the other cumulative projects would have potentially significant impacts.

Because it is not known whether other cumulative projects would implement policies and regulations that are required, and there is uncertainty about the scope and timing of regulations to manage particle-associated contaminants such as polychlorinated biphenyls (PCBs) and legacy pesticides, it is assumed that other cumulative projects would result in potentially significant water quality impacts from other contaminants.

Cumulative Impacts of No Action Alternative

Under the Eden Landing Phase 2 No Action Alternative, no new breaches or other connections to the Bay would be made at southern Eden Landing. The existing gated connections would be left in place, and the managed and muted exchange would remain the dominant hydrology. The ponds would persist as the seasonally managed ponds (Inland Ponds and Southern Ponds) or deep-water managed ponds (Bay Ponds) they are now. In all of these cases, adaptive management would be used to address adverse changes in algal species abundance and composition. If triggers are exceeded as a result of high risk factors, then adaptive management actions would be implemented to convert high-risk factors to low-risk factors. The Inland Ponds and Southern Ponds would continue to be operated with limited directional circulation. Maintaining adequate dissolved oxygen levels is an occasional water quality challenge, as is not violating the salinity requirements for discharge water to the Bay. Adaptive management practices have been implemented to successfully address these potential issues. Under the No Action Alternative, these adaptive management measures would be implemented during low dissolved oxygen conditions (e.g., changing residence times and/or water depths). Because of monitoring and implementation of adaptive management measures, all of these potential impacts would be less than significant.

Sediment mercury concentrations in the ponds are expected to be similar to concentrations found in suspended sediments in the overall South Bay but lower than those in the far South Bay (near the Alviso pond complex). Ponds in that part of the Bay have elevated mercury concentrations in sediments due to deposition of mercury-laden sediments from the Guadalupe River watershed. Long-term mercury concentrations in the sediment of the far South Bay are greater than the target concentration of 0.2 milligram per kilogram (mg/kg), but similar to other areas of the Bay. Managed ponds could have higher rates of net methylmercury production than fully tidal systems. The large pool of easily degraded organic matter in managed ponds (from algal production) could lead to higher methylmercury concentrations in sediment, water, and biota. Labile organic matter fuels the bacteria that methylate inorganic mercury. Ponds that experience very high rates of primary production would likely benefit (in terms of lowering current methylmercury concentrations) from tidal flushing (Grenier et al. 2010). Adaptive management would continue to be used to monitor effects from managed ponds. Adaptive management monitoring could include methylmercury concentrations in water and sediments and special studies of methylmercury production, degradation, transport, and changes in food web indicators and sentinel species. Adaptive management actions would be triggered when the mercury concentrations of sentinel species increase substantially, regardless of whether they are over or under desirable levels. If triggers are exceeded, then adaptive management actions would be implemented.

Although construction activities would not occur under the No Action Alternative, hazards could result from the routine maintenance activities required for managed ponds, which may include levee repair, small-scale construction, and general cleaning. Hazardous materials that could lead to water or sediment quality impairments if spilled would primarily include spills and leaks of liquids (fuels and oils) from maintenance vehicles and equipment. Project proponents would implement control measures specified in the project's waste discharge permit (Water Quality Order No. R2-2008-0078, as revised by R2-2012-0014, or current version). Provisions include specifications for repair, replacement, and servicing of existing facilities; dredging and placement of dredge and/or imported fill material on existing levees; placement of riprap; and general maintenance activities. Implementations of control measures for Operations and Management (O&M) activities would ensure that impacts would be less than significant.

There are potentially significant cumulative impacts relative to water quality in the study region. Other cumulative tidal habitat restoration projects have the potential to increase phytoplankton (algae) abundance and composition as levees are breached. Some of the cumulative projects would have potentially significant impacts when considering the long-term cumulative impacts of discharge of biological oxygen demand and/or chemical oxygen demand into the Bay. Some of the cumulative projects would have impacts when considering the long-term cumulative impacts of mobilization and transport of mercury-contaminated sediments and do not as yet have well-defined AMPs and therefore have potentially significant impacts.

However, the contribution of the Eden Landing Phase 2 No Action Alternative to these cumulative impacts would not be considerable. As discussed above, all impacts to water quality from the Eden Landing Phase 2 No Action Alternative are less than significant. Adaptive management measures would be used to address harmful changes in the abundance and composition of algal species. Adaptive management measures (e.g., changing residence times and/or water depths) also would be implemented to reduce the potential for the adverse conditions associated with high salinity, low dissolved oxygen, or substantial methylmercury levels. Because adaptive management measures would be implemented for the Eden Landing Phase 2 No Action Alternative, their contribution to a significant cumulative water quality impact would not be considerable relative to the existing environment.

Cumulative Impacts of Eden Landing Phase 2 Action Alternatives

Under the Eden Landing Phase 2 Action Alternatives, breaches and other connections between the Bay and the ponds at southern Eden Landing would introduce full tidal inundation, gated tidal exchange, or managed intermittent filling and draining of the ponds. The exact mix of these different mechanisms varies by Action Alternative.

Tidal flows would bring slough water through the openings, near which suspended sediments would settle out from the water prior to ebb flows. Areas near these new levee breaches would have increased accretion. Accretion in the ponds would decrease suspended sediment supply in the surrounding sloughs and the open waters of the Bay, potentially resulting in increased light penetration and algal abundance outside of the ponds. Fully tidal systems (both tidal ponds and sloughs) have relatively short retention times, are well mixed by tidal flows, and are often subject to wind and wave action. In general, Phase 2 actions would increase both the amount and the spatial distribution of tidal mixing, and in no cases would these actions reduce this mixing. Therefore, risk factors are low and potential changes in algal abundance are likely to be minimal. Furthermore, monitoring and implementation of adaptive management measures would be used to address harmful changes in the abundance and composition of algal species. Therefore, impacts would be less than significant.

In Alternative Eden C and Eden D, some of the southern Eden Landing ponds (the Inland Ponds and the Southern Ponds) would not be opened to fully tidal flows but would instead be enhanced as managed ponds with controlled flows through water control structures. If not well managed, these ponds could become stagnant and rich in nutrients, and therefore would have higher risk factors for changes to algal abundance. However, these alternatives include several new water control structures to provide increased and improved control over directional circulation and other management activities to minimize adverse effects. Should managed ponds cause adverse changes to algal abundance and composition, adaptive management measures would be implemented to reduce potential impacts (e.g., manipulating hydraulic residence time or altering the depths of the managed ponds). In all of these cases, adaptive management would be address adverse changes in algal species abundance and composition. If triggers are exceeded as a result of high risk factors, then adaptive management actions would be implemented to convert high-risk factors to low-risk factors. Because of monitoring and implementation of adaptive management measures, all of these potential impacts would be less than significant.

Initial breaching, channel excavation, or other project implementation actions at the ponds may temporarily increase the amount of biological oxygen demand in ebb flows, but tidal currents would also provide mixing, improve reaeration, and dilute nutrients, and the shallow water environment would allow dissolved oxygen from surface reaeration to rapidly become vertically well mixed. Some ponds – the specific ones would again depend on the alternative – would continue to have limited tidal mixing and the residence time in the ponds could be on the order of hours to days. If residence times were long, water in the managed ponds would likely be stagnant and rich in nutrients, particularly in summer months, and therefore dissolved oxygen concentrations may be low. Adaptive management measures (e.g., changing residence times and/or water depths) would be implemented during low dissolved oxygen conditions to reduce the potential for the adverse conditions associated with low dissolved oxygen levels, such as mortality of aquatic or benthic organisms, odors that cause nuisance, or degraded habitat. Because of monitoring, active management, and the implementation of adaptive management measures, these impacts would be less than significant.

The increasing tidal flows in the Bay Ponds (and also in the Inland and Southern Ponds in Alternative Eden B) resulting from the breaching levees would allow full tidal inundation to these ponds and increase tidal flows and scour in adjacent sloughs. Although wetting and drying cycles could enhance methylmercury production, the conversion of deep or stagnant ponds to fully tidal marsh would likely lessen the risk of a mercury problem within the pond. The restored tidal marsh would produce less labile organic matter than what is produced in the managed pond, providing less fuel for methylating bacteria and leading to less methylmercury production. There is a potential risk associated with the remobilization of mercury-laden sediment in sloughs downstream of breaches due to scour from the increased tidal prism following reconnection of ponds to full tidal flows. This scour could increase the amount of inorganic mercury that is available for methylmercury production and uptake into the food web, at least in the short term. However, the remobilized sediment would mix with other sediment, be dispersed by the tides, and proceed through various fates of deposition, burial or further transport (Grenier et al. 2010). Adaptive management would be used to monitor effects from tidal marsh restoration and could include methylmercury concentrations in water and sediments and special studies of methylmercury production, degradation, transport, and changes in food web indicators and sentinel species. Adaptive management actions would be triggered when the mercury concentrations of sentinel species increase substantially, regardless of whether they are over or under desirable levels. If triggers are exceeded, then adaptive management actions would be implemented to avoid significant impacts. Examples of such actions include capping with clean fill, removing mercury-contaminated sediments, or manipulating other factors such as dissolved oxygen concentrations, light penetration, or encouraging development of favorable plant species. Because adaptive management would be used to minimize adverse effects, impacts would be less than significant.

Construction-related activities could lead to short-term, transient adverse water quality impacts during or shortly after the period of construction. Construction activities that could affect water and sediment quality include the placement of dredge materials, placement and grading of levee fill, placement of fill material for habitat transition zones, breaching levees, and construction of hardened crossings, all of which could result in short-term increases in turbidity. Construction activities would also increase the possibility of exposure to or release of hazardous materials and waste associated with construction, such as fuels or oils, as a result of accidents or equipment malfunction or maintenance. Hazards could also result from the routine maintenance activities required for the ponds and public access facilities; such activities may include levee repair, dredging, small-scale construction, and general cleaning. Hazardous materials that could lead to water or sediment quality impairments if spilled would primarily include spills and leaks of liquids (fuels and oils) from the offloading facility and pumps and from maintenance vehicles and equipment. Potential effects to water quality from contaminants other than mercury, methylmercury, and dissolved oxygen could occur. With proper management and oversight, impacts associated with construction activities should not result in exceedances of any thresholds of significant impact. Also, it is unlikely that the impacts associated with mobilization and transport of contaminated sediment would be of a sufficient magnitude or extent as to cause exceedances of the thresholds identified after mitigation. Programmatic mitigation measure **SBSP Mitigation Measure 3.3-4a: Storm Water Pollution Prevention Plan**, would be implemented to further reduce this impact to less than significant.

There are potentially significant cumulative impacts relative to water quality in the study region. Other cumulative tidal habitat restoration projects have the potential to increase phytoplankton (algae) abundance and composition as levees are breached. Some of the cumulative projects would have potentially significant impacts when considering the long-term cumulative impacts of discharge of waters with biological oxygen demand and/or chemical oxygen demand into the Bay. Some of the cumulative

projects would have impacts when considering the long-term cumulative impacts of mobilization and transport of mercury-contaminated sediments and do not as yet have well-defined AMPs and therefore have potentially significant impacts. As discussed above, all impacts to water quality from the Eden Landing Phase 2 Action Alternatives are less than significant. Many of the Eden Landing Phase 2 Action Alternatives would actually improve water quality conditions or reduce a water quality management hurdles by increasing tidal flows and/or by improving the degree of special and temporal control over water levels, temperatures, and salinities in the ponds. Adaptive management measures would be used to address harmful changes in the abundance and composition of algal species. Adaptive management measures (e.g., changing residence times and/or water depths) also would be implemented to reduce the potential for the adverse conditions associated with low dissolved oxygen levels and substantial methylmercury levels. Because adaptive management measures would be implemented for all Eden Landing Phase 2 Action Alternatives, their contribution to a significant cumulative water quality impact would not be considerable relative to the existing environment.

4.3.3 Geology, Soils, and Seismicity

The geographic scope of potential cumulative geology, soils, and seismicity impacts is limited to the vicinity of the Eden Landing Phase 2 project. The NEPA- and CEQA-related impacts associated with geological hazards are generally site-specific and depend on localized geologic and soil conditions. As a result, they are not typically additive or cumulative in nature.

Due to the nature of impacts associated with geology, soils, and seismicity, only projects in close proximity to the southern Eden Landing ponds are considered in the cumulative analysis. Cumulative projects considered in the 2007 Final EIS/R and those listed in Table 4-1would consider local ongoing and future settlement and subsidence from consolidation of bay mud and liquefaction as part of their design and construction. Review of the 2007 Final EIS/R and the cumulative projects listed in Table 4-1 indicates that less-than-significant cumulative impacts are associated with geology, soils, and seismicity in the study region.

Cumulative Impacts of No Action Alternative

Under the Eden Landing Phase 2 No Action Alternative, the existing southern Eden Landing pond levees would be allowed to continue to degrade, and no new structures or weight would be added that could expedite any already occurring rates of subsidence or increase the risks associated with liquefaction or fault rupture. Therefore, implementation of the No Action Alternative would not increase the risk of any of these hazards. This impact would be less than significant.

No significant cumulative impacts associated with geology, soils, and seismicity exist in the project area, and the contribution of the Eden Landing Phase 2 No Action Alternative to cumulative impacts related geology, soils, and seismicity would not be considerable and would not trigger a significant cumulative impact.

Cumulative Impacts of Eden Landing Phase 2 Action Alternatives

Under the Eden Landing Phase 2 Action Alternatives, raising or improving levees, building habitat islands, or constructing habitat transition zones would add additional weight to some areas underlain by bay mud, thereby potentially increasing the existing rate of settlement. However, the levees and other improvements would be designed and constructed to compensate for settlement and consolidation that would prevent tidal overtopping and be intended to prevent flooding. Also, the levees and other features

would be improved and designed to withstand seismic events to the extent practicable. These features would not be placed so as to create new impacts or worsen existing potential impacts on people or property. The long-term settlement of improved levees and other structures resulting from increased weight would be offset by required maintenance to ensure minimum elevations are achieved and potential effects on people and property would be less than significant. The nearby associated infrastructure (roads, railways, bridges, utility access structures, etc.) would continue to be maintained as needed. As such, potential effects from settlement due to consolidation of bay mud would be less than significant.

The Eden Landing Phase 2 Action Alternatives would not cause habitable structures to be constructed within the project areas and would not create new opportunities to expose people to damages resulting from liquefaction, lateral spreading, or fault rupture.

No significant cumulative impacts associated with geology, soils, and seismicity exist in the project area. As discussed above, the Eden Landing Phase 2 Action Alternatives would create less than significant geology impacts. The long-term settlement of improved levees resulting from increased weight would be offset by required maintenance to ensure minimum elevations are achieved. Any failures of upland flood control levees caused by liquefaction or lateral spreading would be repaired similar to what would occur under the management strategy of the AMP. Improved levees would be constructed to withstand failure from fault rupture to the extent practicable. Also, given the site-specific nature of geology impacts under CEQA or NEPA, the Eden Landing Phase 2 Action Alternatives contribution to cumulative impacts would not trigger a significant cumulative impact.

4.3.4 Biological Resources

The geographic scope for the biological resources cumulative impact analysis encompasses areas (including wetlands, intertidal areas, sensitive habitats, streams, and riparian habitats) that could be affected by the proposed project and the projects identified in Table 4-1. This region is appropriate because the habitats and wildlife species that would be affected by the project are part of a broader ecosystem, and the potential disturbance of individual areas has repercussions for a wider region than the immediate project vicinity.

The cumulative impact projects with the greatest potential to affect these are the restoration projects, water treatment plant projects, port enhancements or dredging projects, and flood protection projects because those projects have the greatest potential to have effects to biological resources in the estuarine environment. Review of the 2007 Final EIS/R and the updated cumulative projects listed in Table 4-1 indicates that potentially significant cumulative impacts relative to biology exist in the study region. Additional tidal restoration efforts that are underway or proposed in San Francisco Bay could reduce the availability of high-tide habitat for small shorebirds to some degree. High-tide roosting habitat is unlikely to limit populations, however, because pond levees, islands, and other alternative habitats can support high densities of roosting birds. However, conversion of existing ponds to tidal habitats would reduce the numbers of sites where shorebirds can congregate at high tide, potentially resulting in increased predation, crowding effects (possibly including increased susceptibility to disease), and increased disturbance (and associated increases in energy expenditure) by predators and humans. The effects of restoration projects in other parts of the Bay on high-tide foraging habitat are expected to be fairly minor, because the highest numbers of shorebirds using salt ponds in the Bay Area occur in the South Bay.

Tidal wetland restoration projects are expected to influence mudflat habitat acreage and productivity, whereas other cumulative projects are expected to have minimal effect on mudflat habitat acreage or

productivity. Approximately 2,500 acres of tidal wetlands have been restored or are planned to be restored in the South Bay in addition to the SBSP Restoration Project. Additional current pond habitat is planned to be opened to the tides and begin accreting sediment to form tidal wetlands. The sediment demand associated with the cumulative amount of tidal wetland restoration in San Francisco Bay, and the South Bay in particular, in light of sea-level rise would potentially result in a loss of mudflat area. Furthermore, some mudflat loss may be offset by increases in mudflat productivity due to marsh restoration and the transport of organic material from restored marshes to mudflats. Therefore, the extent to which mudflat loss would result in a decline in mudflat-associated wildlife species is uncertain. Nevertheless, because of the potential loss of mudflats as a result of sea-level rise and the cumulative tidal wetland restoration projects, a potentially significant cumulative impact would occur. The potential loss of mudflats as a result of cumulative tidal wetland restoration projects and sea-level rise is expected to reduce the area of mudflat foraging habitat for small shorebirds. As a result of this potential mudflat loss, coupled with the conversion of high-tide foraging habitat in managed ponds to tidal habitats, other tidal restoration projects and sea-level rise could potentially result in a significant cumulative impact to small shorebird numbers and the populations of other mudflat-dependent species in the South Bay.

Cumulative Impacts of No Action Alternative

This section first summarizes the discussions of significance determinations in Section 3.5, Biological Resources, for each of the 25 numbered impacts at southern Eden Landing under the No Action Alternative. The discussion generally follows the order of those numbered impacts. It then discusses whether the Eden Landing Phase 2 No Action Alternative makes a considerable contribution to any existing or newly identified cumulatively significant impacts.

Under the Eden Landing Phase 2 No Action Alternative, there would either be less-than-significant impacts or no impacts to biological resources, depending on the ponds and impacts in question. Under the No Action Alternative, no new construction activities would occur. The CDFW would continue to operate and maintain the ponds in accordance with ongoing management practices that have been in place since the implementation of Initial Stewardship Plan actions and the adoption of the AMP and the 2007 Final EIS/R, as well as CDFW-specific operations plans for the Reserve. In general, small shorebird habitat would remain relatively unaffected, resulting in less-than-significant impacts to small shorebirds. There would be no change to intertidal mudflat habitat and less-than-significant or no impacts to wildlife species in the South Bay.

Several species of small shorebirds (examples of common species include semipalmated plover, western sandpiper, least sandpiper, dunlin, short-billed dowitcher, and long-billed dowitcher) occur in the San Francisco Bay Area, primarily during migration and in winter (roughly July through April). San Francisco Bay is one of the most important stopover and wintering areas on the west coast for these species. Within San Francisco Bay, the majority of these birds are typically found in the South Bay. There are potentially significant cumulative impacts to small shorebirds in the project area. However, the Eden Landing Phase 2 No Action Alternative would cause no impacts to shorebirds. Therefore, the Eden Landing Phase 2 No Action Alternative would not have a considerable contribution to a cumulative impact.

Western snowy plovers have found suitable habitat conditions in some former salt ponds that are now seasonally wet ponds. At southern Eden Landing, several of the Inland Ponds and Southern Ponds presently provide western snowy plover habitat. Under the No Action Alternative, there would be no change in impacts to snowy plover habitat at these ponds. Also, CDFW continues to manage portions of northern Eden Landing specifically and successfully for western snowy plover. Further, the United States

Fish and Wildlife Service (USFWS) Refuge is planning and implementing a number of habitat enhancements and other management techniques to increase western snowy plover populations. These techniques may include treating the nesting substrates with shells and other surfaces to increase camouflage and thus nesting success. These treatments include constructing habitat islands to provide isolated nesting areas at Eden Landing Ponds E12 and E13 and Refuge Pond SF2, conducting social attraction experiments such as those currently underway at Pond SF2, and harassing predator species. Portions of both Eden Landing and the Refuge will continue to be actively monitored and managed for western snowy plover, and the results of those experiments will continue to be adapted and reapplied to implement appropriate actions to maintain western snowy plover populations and protect their habitat.

American avocets, black-necked stilts, Forster's terns, and Caspian terns are colonial waterbirds that nest and forage within portions of the SBSP Restoration Project area. These birds nest on islands within ponds and, in the case of stilts and avocets, on salt pond levees; in dry salt panne habitat; in marshes on higher ground around marsh ponds; and in other bayside habitats. There would be no changes in available nesting, roosting, and foraging habitat for pond-associated waterbirds over time under the No Action Alternative, and no changes to the baseline populations are expected.

Diving ducks, such as lesser and greater scaup, bufflehead, canvasbacks, and other species, occur in the South Bay primarily during the nonbreeding season. No construction activities or actions would be conducted under the No Action Alternative, so there would be no changes over time to the baseline foraging habitat of diving ducks. The southern Eden Landing ponds would be maintained in their current condition and would generally continue to provide the same habitat functions as they do now. These operations are not expected to produce substantial declines in flyway-level populations or reduce the population of diving ducks 20 percent below baseline levels.

Although small numbers of ruddy ducks breed in the South Bay, this species occurs in the project area primarily during their winter migration. In contrast with most of the diving ducks addressed above, ruddy ducks are diving ducks that, in the South Bay, forage primarily in salt ponds, with relatively few individuals using tidal habitats in the South Bay. Currently, a small number of ruddy ducks use the ponds and adjacent sloughs at southern Eden Landing for foraging. These ponds would be maintained in their current condition and would continue to provide suitable ruddy duck foraging habitat. However, open water habitat for ruddy ducks is present elsewhere in the South Bay. Neither substantial declines in flyway-level populations nor a 15 percent reduction in population is expected under the No Action Alternative.

Dabbling ducks forage in a variety of habitats in the South Bay, including mudflats, shallow subtidal habitats, tidal sloughs and marsh channels, marsh ponds, managed and muted tidal marsh, seasonal wetlands, managed ponds, and water treatment plants. There would be no impacts to dabbling ducks in the Eden Landing Phase 2 No Action Alternative.

The California least tern uses levees in the South Bay as post-breeding roosting sites. After breeding (primarily at Central Bay sites), adult California least terns bring their juvenile offspring to the South Bay to forage before migration. The No Action Alternative would have less-than-significant impacts on the California least tern at the southern Eden Landing because of the ample substitute forage and roosting habitat available to this species.

No changes would occur to pickleweed-dominated tidal salt marsh at southern Eden Landing under the Eden Landing Phase 2 No Action Alternative, though small losses of pickleweed-dominated tidal marsh

may occur if uncontrolled levee breaching occurs due to erosion and scour. Because such breaches would be unintentional, the locations and extent of habitat loss would not be controlled at all, and thus salt marsh harvest mouse and wandering shrew dispersal in any given area may be adversely affected in the short term.

In the South Bay, managed ponds support lower diversity of native fishes than tidal habitats do. Conversely, many of the fish recorded in the South Bay use tidal channels and mudflats at high tide, when they are inundated. These tidal habitats are particularly important as nursery habitat for juvenile fish. These habitats are present in the sloughs and channels around southern Eden Landing, and the ACFCC is a known steelhead run. There would be no impacts to steelhead or estuarine fish in the Eden Landing Phase 2 No Action Alternative.

The piscivorous birds (e.g., pelicans, cormorants, grebes) of the South Bay forage in a variety of habitats and locations where prey fish are available. The low-salinity salt ponds that support fish, tidal sloughs and channels, edges of intertidal mudflats, non-tidal ponds and channels, and artificial lakes provide the highest-quality foraging areas. The ponds at southern Eden Landing currently large areas provide foraging opportunities for piscivorous birds. There would be no impacts to piscivorous birds at Eden Landing under the No Action Alternative.

Pacific harbor seals are currently the only marine mammals that are permanent residents of San Francisco Bay. Harbor seals forage in nearshore marine habitats on a variety of fishes and invertebrates. The No Action Alternative would have no impacts on harbor seals at southern Eden Landing. Also, under the No Action Alternative, no increased recreation access would be provided, and no new impacts to sensitive species and their habitats would occur from recreation-orientated activities.

Currently, no threatened or endangered plants species are known to occur in the Eden Landing Phase 2 project area, but several other special-status species have some potential to occur. Because there would be no actions implemented under the No Action Alternative, there would be no impact to any of these plant species under the No Action Alternative.

Regarding invasive cordgrass (*Spartina alternaflora*), the potential uncontrolled nature of levee breaching or failure under the No Action Alternative could lead to locations and timing of tidal restoration that temporarily increase colonizable land in areas where control is difficult due to access. However, in general, Spartina colonization is expected to be controlled by the Invasive Spartina Project. Monitoring and management of changes in abundance of smooth cordgrass and its hybrids in the SBSP Restoration Project area are described in the AMP. With the AMP, which would be implemented under all alternatives, and in collaboration with the Invasive Spartina Project, Spartina would be monitored and controlled to reduce impacts to a less than significant level. Large stands of Lepidium are present along channels to the south of Eden Landing (shown on Figure 3.5-5), but there is not an existing cumulative impact. Nothing in the Eden Landing Phase 2 No Action Alternative would increase the chance of further establishment of this species.

Of the wildlife diseases that could potentially affect species in the South Bay, those affecting birds are of greatest concern because of the ease with which they may be transmitted (due to birds' mobility) and the large numbers of individuals that can potentially be exposed to diseases in flocks or colonies. Avian botulism, the avian disease with the greatest potential to affect large numbers of birds, is caused by a toxin produced by the bacterium *Clostridium botulinum*. Under the No Action Alternative, CDFW would continue to maintain the managed low-salinity Bay Ponds and the seasonally managed Inland Ponds and

Southern Ponds in their current states. Under the No Action Alternative, there would be no increase in exposure of wildlife to avian botulism and other diseases.

The epifaunal invertebrate community in the South Bay is dominated by several species of shrimps and crabs. Two native caridean shrimps, the California bay shrimp and the blacktail bay shrimp, are common in tidal sloughs and in the Bay itself. Bay shrimp may utilize tidal sloughs within the marsh as nurseries. Under the No Action Alternatives, there would be no change in the discharges compared to baseline. Bay shrimp and other invertebrates would not be affected by the continued management and operation of the ponds at southern Eden Landing.

Jurisdictional wetlands and non-wetland waters of the United States occur at southern Eden Landing. Under the No Action Alternative, there would be no changes in the area of waters or wetlands other than the current slow dynamics of fringing marshes in the surrounding waterways. Impacts to existing jurisdictional wetlands or waters would be less than significant.

Potentially significant cumulative impacts associated with biological resources are present in the Eden Landing Phase 2 project area. There is a potential loss of mudflats as a result of sea-level rise and the cumulative tidal wetland restoration projects. As a result of this potential mudflat loss, coupled with the conversion of high-tide foraging habitat in managed ponds to tidal habitats, other tidal restoration projects and sea-level rise could potentially result in a significant cumulative impact to small shorebird numbers and the populations of other mudflat-dependent species in the South Bay. Under the Eden Landing Phase 2 No Action Alternative small shorebird habitat would remain relatively unaffected. As stated above, impacts of the Eden Landing Phase 2 No Action Alternative to biological resources would either be less than significant or have no impact. The less than significant impacts are relatively minor and would not trigger a significant cumulative impact when combined with the impacts of other cumulative projects.

Cumulative Impacts of Eden Landing Phase 2 Action Alternatives

As discussed in Section 3.5, Biological Resources, under the Eden Landing Phase 2 Action Alternatives, there would be less-than-significant impacts or no impacts to biological resources under all of the Eden Landing Phase 2 Action Alternatives. Also, as expected under a restoration project, many of the individual impacts on biological resources would be beneficial under NEPA.

Under the Eden Landing Phase 2 Action Alternatives, levees would be breached and/or lowered or removed to introduce tidal flows to some or all (depending on the alternative selected) of the former salt production ponds to either begin their transition to tidal marsh habitat. The Action Alternatives also include habitat improvements such as islands, habitat transition zones, and pilot channels. In all alternatives, though the locations would vary, levee raising and other improvements would be made to maintain or improve the existing levels of flood protection. The Eden Landing Phase 2 Action Alternatives' habitat enhancements and public access features would include trails and one or more viewing platforms. There would also be new water control structures and other hydraulic connections to surrounding waterways that would allow connectivity of the ponds with flows from the ACFCC in all Action Alternatives and into the OAC in some of them. These structures would allow enhanced managed ponds to would provide CDFW with improved control over water levels, quality, and timing in these ponds to allow a different type of managed pond habitat, depending on the Action Alternative selected. The various Action Alternatives present variations in the number, location, and size of these breaches; other levee and pond modifications; habitat enhancements; water control structures; and public access features.

All of these Action Alternative changes are discussed in detail in Chapter 2, Alternatives. The expected effects of 25 individually numbered impacts were analyzed for each Action Alternative and presented in depth in Section 3.5, Biological Resources. To simplify the cumulative impacts analysis, this section describes the significance determination of those impacts in a high-level/overview fashion that is intended to identify the types of changes that could have potential to cause a new cumulative adverse impact or to make a considerable contribution to an existing cumulative impact.

The Eden Landing Phase 2 Action Alternatives were found to have the potential to affect biological resources in a number of ways:

- Habitat conversion or loss;
- Import and placement of material;
- Disturbance from recreational use of public access features;
- Construction-related effects;
- Increased crowding or susceptibility of wildlife species to predation or disease;
- Creating conditions that are suitable for establishment of invasive plant species; or
- Loss of jurisdictional wetlands and waters of the United States.

As Section 3.5, Biological Resources, explains in detail, most of these changes are expected to be beneficial or neutral to most of the specific biological resources or types/categories of them included in the 2007 Final EIS/R. Program-level avoidance and minimization measures, implementation of the AMP and other standard management practices used by CDFW, ongoing collaboration with the adjacent county agencies (ACFCWCD), and continued implementation of monitoring and control programs such as the Invasive Spartina Project are expected to be effective in reducing impacts to levels that are less than significant, even on a cumulative basis.

Thus, in almost all cases, the potential for cumulative adverse impacts on biological resources is minimal; most of the effects of the SBSP Restoration Project would be beneficial to at least some of these resources. In the cases where small and short-term adverse impacts are expected and planned for—for example, excavating a channel through an existing fringing tidal marsh to connect a pond to the Bay—the long-term benefits are expected to be much greater: the acreage of the restored tidal marsh in the former pond would be several orders of magnitude larger than that lost in the excavated channel. Further, many of the cumulative impact projects listed in Table 4-1 are similarly oriented toward some form of habitat restoration, meaning that many of the cumulative impacts are themselves beneficial when taken in the aggregate.

The exceptions to this general statement were found to be limited to those biological resources that utilize the existing former salt ponds and/or their surrounding levees in their current configuration. Some wildlife species or guilds—most notably, birds that use shallow or deep-water ponds or dry salt pannes and their surroundings for nesting, roosting, and/or foraging—would see an overall reduction in the quantities of those habitats. However, with the exception of dry salt pannes, these habitat types are not in short supply in the South Bay. As discussed in Section 3.5, Biological Resources, in most cases the affected species do not wholly depend on these particular habitats or features, and Section 3.5 concluded that affected species would be able to gradually relocate to other, similar habitats in the vicinity without

losses of individuals in high enough numbers to trigger a significance impact. Nevertheless, the Eden Landing Phase 2 Action Alternatives do include islands and other habitat enhancements intended to help minimize the adverse effects of restoring tidal flows to those ponds by increasing the quality of certain habitats even as the absolute quantities of them are diminished.

Western snowy plover have in recent years made limited use of the dry salt panne habitat provided by seasonal pond operations at the Inland Ponds and Southern Ponds for nesting, and they forage in adjacent waters. This habitat would be reduced in Alternative Eden B. In Alternatives Eden C, the plover habitat enhancements recently completed at northern Eden Landing were seen as effective enough to offset these adverse impacts to a less-than-significant level.

Several species of small shorebirds (examples of common species include semipalmated plover, western sandpiper, least sandpiper, dunlin, short-billed dowitcher, and long-billed dowitcher) occur in the San Francisco Bay Area, primarily during migration and in winter (roughly July through April). Restoration of former salt ponds to tidal habitats is expected to increase the availability of intertidal mudflat foraging area at low tide in the short term, as some of the breached ponds would provide intertidal mudflat habitat for some time before accreting enough sediment to become vegetated. However, in the long term, sedimentation patterns of the South Bay are expected to result in a loss of intertidal mudflat.

The Eden Landing Phase 2 Action Alternatives could potentially affect numbers of diving ducks in the South Bay in several ways. By converting ponds that currently provide foraging habitat for diving ducks to tidal habitats or enhanced managed ponds with a different hydrological regime, the Phase 2 actions would result in an overall loss of managed pond habitat relative to the baseline. This conversion is expected to adversely affect habitat for bufflehead, which occur in the South Bay primarily in managed ponds and make relatively little use of tidal waters. However, subtidal habitat in sloughs and larger channels within restored ponds would provide foraging habitat for species such as canvasbacks and scaup, potentially offsetting the effects of the loss of managed pond habitat. Because there is so little existing forage habitat for diving ducks at Eden Landing now, the Phase 2 activities are unlikely to affect enough individuals to cause a population decline of 20 percent below baseline level or substantially reduce flyway-level populations. Also, open water habitat for diving ducks is present elsewhere in the South Bay.

Although small numbers of ruddy ducks breed in the South Bay, this species occurs in the project area primarily during winter-spring and their migration. Because ruddy ducks in the South Bay make little use of tidal waters, the Eden Landing Phase 2 Action Alternatives would likely result in declines in ruddy duck numbers within the South Bay due to conversion of managed ponds to tidal habitats. These changes are not expected to produce substantial declines in flyway-level populations or reduce the population of ruddy ducks 15 percent below baseline levels. Compared to the habitat present for ruddy ducks in the South Bay, the changes to habitat would be small and less than significant.

The tidal marshes that develop under the Eden Landing Phase 2 Action Alternatives are expected to provide roosting and foraging habitat for dabbling ducks. There would be less-than-significant impacts or no impacts to dabbling ducks with any of the Eden Landing Phase 2 Action Alternatives.

During the transition to tidal marsh following breaching of the southern Eden Landing levees, Lepidium could become established, particularly along the margins of new channels that develop within the ponds. The AMP, as discussed in the 2007 Final EIS/R, addresses monitoring and control of Lepidium colonization. The implementation of the AMP would reduce this impact to less than significant in itself

and would not contribute to a cumulative impact. Similar logic applies to invasive Spartina, for which no cumulative impact currently exists because of the successful implementation of the Invasive Spartina Project.

Increased recreational access resulting from Eden Landing Phase 2 Action Alternatives may impact sensitive species and their habitats. However, such disturbance would likely be limited to relatively narrow corridors along the edges of the ponds where trails get added or improved. Further, these effects would be monitored and managed, and implementation of the AMP would ensure that impacts do not reach significant levels. Public access has considerable potential to result in long-term benefits to sensitive species in the South Bay by improving public education concerning the importance of the SBSP Restoration Project and habitat restoration and South Bay conservation in general. With monitoring and implementation of the AMP, impacts of recreation would be less than significant, and there would be no new cumulative impact associated with it.

In sum, the ongoing balancing of SBSP Restoration Project impacts across many locations as part of the AMP allows minor losses or conversions of some area of one type of habitat in one location can be offset with enhancement of that same type of habitat in that same location or elsewhere. Such enhancements would allow smaller areas of habitat to be equally valuable and beneficial to that particular species or other biological resources.

Because of the less-than-significant impacts or the lack of adverse impacts summarized above most types of cumulative impacts were ruled out categorically. The remaining ones are potential effects to western snowy plover, small shorebirds, and ducks. The effects on these resources were considered in combinations with the expected impacts of the cumulative impact projects listed in Table 4-1. In other cases where potential impacts were identified but concluded to be less than significant, the magnitude of the impacts is so small relative to the background dynamics in the existing environment that there would not be a considerable contribution to any significant cumulative impact that may exist. The impacts of construction-related noise on wildlife species is an example.

4.3.5 Recreation Resources

The geographic scope for cumulative impacts on recreational resources includes the cities and other communities where the proposed project and cumulative projects would be located (the cities of Hayward, Fremont, and Union City and portions of unincorporated Alameda County). This geographic scope is appropriate for this analysis because the displacement of recreational uses from one area can result in the increased use of recreational facilities in another.

The types of projects listed in Table 4-1 that could contribute to cumulative impacts associated with recreation resources include restoration projects, flood protection projects, development projects, and recreation projects. Review of the 2007 Final EIS/R and the cumulative projects listed in Table 4-1 indicates no significant cumulative impacts associated with the provision of new public access and recreation facilities in the study region. Recreation-related projects (e.g., construction of trails and viewing platforms) identified in the planned project lists of local jurisdictions and other cumulative restoration and flood risk management projects would provide new recreation opportunities (both active and passive) through the development of public access, trails, or other recreation features. Also, it is possible that some of these cumulative trail projects would fill the gaps of the regional Bay Trail network. Other cumulative projects (e.g., residential or commercial development projects) may also require the installation of recreational components.

Cumulative Impacts of No Action Alternative

Under the Eden Landing Phase 2 No Action Alternative, no new recreation activities would occur, and no new facilities would be provided. The ponds at southern Eden Landing would continue to be monitored and managed by CDFW according to its plans and policies and other activities described in the AMP. Existing recreation use near southern Eden Landing would continue to be similar to that under existing conditions and would not change in the long term.

No significant cumulative impacts associated with recreation resources exist in the project area, and the contribution of the Eden Landing Phase 2 No Action Alternative to cumulative impacts related to recreation resources would not be considerable and would not trigger a significant cumulative impact.

Cumulative Impacts of Eden Landing Phase 2 Action Alternatives

In general, the Eden Landing Phase 2 Action Alternatives would increase the availability and quality of public access and recreation opportunities in the communities surrounding the alternatives. The Eden Landing Phase 2 Action Alternatives are not expected to cause any significant adverse environmental effects on recreational facilities or to affect long-term recreational use of the study area except for temporary closures of certain parks, parking areas, or trails associated with the actual construction of some of the Action Alternatives. When considered in conjunction with the projects listed in the 2007 Final EIS/R and Table 4-1 and the ongoing uses of the study region, the effects of the Eden Landing Phase 2 Action Alternatives on recreational resources are not expected to cause or contribute to cumulatively significant short-term interruptions of recreational use of regional facilities such as the Bay Trail; short-term or long-term losses of recreational opportunities (trails and boating); or short-term or long-term needs for construction of new recreational facilities.

The Eden Landing Phase 2 Action Alternatives generally provide greater recreational benefits than currently exist and have less than significant impacts to recreation resources. Restoration of the former salt production ponds to tidal marsh habitat and/or enhanced managed ponds involves activities that would cause changes to the existing trail system in the form of new Bay Trail spine and spur trails and improved connectivity. New trail segments would be constructed as part of the Eden Landing Phase 2 project. With these improvements, the contribution of the Eden Landing Phase 2 Action Alternatives to cumulative impacts to the recreational trail network is not considerable.

Urban infill and increased public access at refuges and reserves in the Bay Area have caused conflicts with hunting. These trends are expected to continue, causing even greater limitations to hunting opportunities in the Bay Area. For the purposes of this analysis, it is assumed that past and current practices, as well as other cumulative projects, would cause a significant cumulative impact (lost hunting opportunities) regardless of actions taken within the Eden Landing Phase 2 project area.

Hunting opportunities would be constrained in the southern Eden Landing ponds during project construction, particularly at the Bay and Inland Ponds with the placement of dredge material, and during post-construction due to public use of some trail segments. These impacts are considered less than significant because nearby alternative locations would be available for hunting in the northern Eden Landing managed ponds. Therefore, the lost hunting opportunities associated with Eden Landing Phase 2 Action Alternatives would not provide a cumulatively considerable incremental contribution to the significant cumulative impact.

4.3.6 Cultural Resources

The geographic scope for cultural resources cumulative impacts includes all areas that would be disturbed by the projects identified in the 2007 Final EIS/R and those listed in Table 4-1. This scope is appropriate because it is large enough to encompass a representative sample of prehistoric and historic populations that once occupied the region.

The cumulative projects that involve ground disturbance or that would generate groundborne vibration could affect cultural resources by uncovering previously undiscovered archaeological or paleontological resources or by damaging historic structures, potentially resulting in additional cumulative impacts on these resources. The past, present, and reasonably foreseeable future actions considered by this cumulative impacts analysis are residential and non-residential development in the cumulative study area that could affect cultural resources.

All of the types of projects listed in Table 4-1 that would cause ground-disturbing activities could contribute to cumulative impacts associated with cultural resources. Review of the 2007 Final EIS/R and the cumulative projects listed in Table 4-1 indicates that no significant cumulative impacts to cultural resources occur in the study region. By law, all projects are required to take appropriate actions in the event of a find of cultural resources, as stated in **SBSP Mitigation Measure 3.8-1** of the SBSP Restoration Project (see Section 3.8, Cultural Resources, of the 2007 Final EIS/R). These required actions include stopping work, having a qualified archaeologist examine and determine the significance of the find, determining measures for treatment of the cultural resources, and contacting a Native American most likely descendant. Because such measures are required to address the potential for disturbance to cultural resources, the impacts associated with cumulative projects would be less than significant.

There is a wide range of known and unknown cultural resources that may be disturbed by some aspect of individual restoration activities. Because so many of these resources are probably obscured, they may only be encountered during project-related earthmoving activities. Accidental discoveries made during construction may be unavoidable; however, as emphasized in the National Historic Preservation Act, CEQA, and local plans and policies, wherever practicable, preservation of cultural resources is preferred over additional damage and/or data recovery.

Cumulative Impacts of No Action Alternative

Under the Eden Landing Phase 2 No Action Alternative, the southern Eden Landing ponds and their surroundings would continue to be monitored and managed through the activities described in the AMP. No new activities would occur and no cultural resources would be adversely affected.

No significant cumulative impacts associated with cultural resources exist in the project area, and the contribution of the Eden Landing Phase 2 No Action Alternative to cumulative impacts related to cultural resources would not be considerable and would not trigger a significant cumulative impact.

Cumulative Impacts of Eden Landing Phase 2 Action Alternatives

Under the Eden Landing Phase 2 Action Alternatives, there is the potential that previously undocumented cultural resources are present below the surface and could be affected by project activities. However, implementation of **SBSP Mitigation Measure 3.8-1** and **Mitigation Measure 3.8-2** (described in Chapter 2, Alternatives) would reduce project-related impacts to recorded or unrecorded cultural resources to less-than-significant levels.

No significant cumulative impacts associated with cultural resources exist in the project area. As discussed above, the Eden Landing Phase 2 Action Alternatives would create less than significant impacts to cultural resources since **SBSP Mitigation Measure 3.8-1** and **SBSP Mitigation Measure 3.8-2** would be implemented as part of the project. Therefore, the contribution of the Eden Landing Phase 2 Action Alternatives to cumulative impacts would not be considerable and would not trigger a significant cumulative impact.

4.3.7 Land Use

The geographic scope for cumulative impacts on land use includes the cities and communities where the proposed project and cumulative projects would be located (the cities of Fremont, Hayward and Union City and portions of unincorporated Alameda County).

Review of the 2007 Final EIS/R and the cumulative projects listed in Table 4-1 indicates that no significant cumulative impacts on land use and planning resources occur in the study region. Most cumulative projects (especially residential, commercial, and industrial development) are required to conform to the designated uses of general plans and the zoning ordinances of affected jurisdictions before approval. These projects include the cumulative projects listed in the 2007 Final EIS/R and those listed in Table 4-1. Development projects, in particular, must go through the affected jurisdiction's review process to determine conformity with designated uses, and if required, applicants must apply for a land use zoning amendment for the proposed development parcel before obtaining project approval and construction. Some cumulative public projects may not conform to designated land uses or zoning, but proposed uses are typically compatible with surrounding land uses (e.g., water-related projects within residential areas). Because all projects need to either conform to the appropriate land use designations or be compatible with surrounding land uses, cumulative land use impacts associated with other cumulative projects would be less than significant.

Cumulative Impacts of No Action Alternative

Under the No Action Alternative, the southern Eden Landing ponds would continue to be monitored and managed according to the *Eden Landing Ecological Reserve (Baumberg Tract) Restoration and Management Plan* (1999) and the *Eden Landing Ecological Reserve System E2 and E2C Operation Plan* (Operations Plan), which implemented the Initial Stewardship Plan and describes the current pond management activities that are carried out to meet the goals and objectives for managed ponds within the Eden Landing Phase 2 project area. No new activities would occur.

No significant cumulative impacts associated with land use exist in the project area, and the contribution of the Eden Landing Phase 2 No Action Alternative to cumulative impacts related to land use would not be considerable and would not trigger a significant cumulative impact.

Cumulative Impacts of Eden Landing Phase 2 Action Alternatives

None of the activities that would occur under the Eden Landing Phase 2 Action Alternatives would create a land use incompatibility. The preservation of open space areas, protection of wildlife habitat, and provision of new recreation facilities would result in a beneficial impact and would be consistent with land use plans and other plans adopted for the purposes of avoiding or mitigating an environmental impact. Therefore, the Eden Landing Phase 2 Action Alternatives would not introduce land uses that would be incompatible with surrounding uses.

Because all projects need to either conform to the appropriate land use designations or be compatible with surrounding land uses, no significant cumulative impacts associated with land use exist in the project area. As stated above, all Eden Landing Phase 2 Action Alternatives would have less than significant land use impacts. The contribution of the Eden Landing Phase 2 Action Alternatives to cumulative impacts related to land use would not be considerable and would not trigger a significant cumulative impact.

4.3.8 Public Health and Vector Management

The geographic scope for public health and vector management includes the Alameda County Mosquito Abatement District. The district uses source reduction, source prevention, larvicide programs, fish programs, mosquito monitoring, vectorborne disease monitoring, and other tools to avoid, reduce, and manage mosquito problems. The district sprays larvicide into the salt marshes and other waterways at various times, as needed, and contributes to the cumulative condition for public health vector management.

The ongoing mosquito abatement project listed in Table 4-1 could contribute to avoiding cumulative impacts associated with public health and vector management. Review of the 2007 Final EIS/R and the cumulative projects listed in Table 4-1 indicates that no significant cumulative impacts regarding public health vector management exist in the study region. In other parts of the Bay, ongoing and proposed tidal restoration projects are expected to reduce the extent and quality of mosquito breeding habitat, thus reducing the need for vector management. Such reductions would result from the conversion of impounded and diked habitats, which often contain standing water with vegetation, to well-drained tidal marshes that are less suitable for use by breeding mosquitoes. Other cumulative projects listed in the 2007 Final EIS/R and in Table 4-1 (e.g., development and transportation or flood protection projects) are not expected to increase or decrease mosquito populations. Cumulative projects would result in a less-than-significant cumulative impact associated with increases in mosquito populations.

Cumulative Impacts of No Action Alternative

Under the No Action Alternatives, the southern Eden Landing ponds would continue to be monitored and managed through the activities described in the AMP. No new activities would occur.

No significant cumulative impacts associated with public health and vector management exist in the project area, and the contribution of the Eden Landing Phase 2 No Action Alternative to cumulative impacts related to public health and vector management would not be considerable and would not trigger a significant cumulative impact.

Cumulative Impacts of Eden Landing Phase 2 Action Alternatives

The Eden Landing Phase 2 Action Alternatives, for the most part, would likely result in an overall decrease in potential mosquito breeding habitat for the salt-marsh-dwelling mosquito species by providing more thorough tidal flushing. However, in some instances, opening ponds to tidal flows could result in an increase in mosquito habitat relative to the existing conditions. Tidal marshes (once they are established) are suitable habitat for some mosquito species, while the currently large salt ponds with vigorous wind action provide minimal habitat. Thus, there could be an increase the potential habitat for some types of salt marsh mosquito species. Also, the planned habitat transition zones could result in an overall increase in potential mosquito breeding habitat if they are not designed, constructed, and maintained so that water does not pool in them and allow mosquito breeding. Mosquito and vector management would continue to follow the general O&M procedures of the abatement districts and the Refuge and use the AMP for vector

control. By design, the implementation of the AMP management actions would occur early enough, due to the established AMP management triggers, to avoid substantial increases in the need for vector management activities while minimizing potential increases in mosquito populations.

No significant cumulative impacts associated with public health and vector management exist in the project area. For the Eden Landing Phase 2 Action Alternatives mosquito and vector management would continue to follow the general O&M procedures of the abatement districts and the Reserve and use the AMP for vector control minimizing potential increases in mosquito populations. The contribution of the Eden Landing Phase 2 Action Alternatives to cumulative impacts related to public health and vector management would not be considerable and would not trigger a significant cumulative impact.

4.3.9 Socioeconomics and Environmental Justice

The study area for the socioeconomics and environmental justice cumulative impacts analysis includes the cities of Fremont, Hayward, and Union City in the vicinity of the southern Eden Landing ponds.

Review of the 2007 Final EIS/R and the cumulative projects listed in Table 4-1 indicates that less-than-significant cumulative impacts regarding socioeconomics exist in the study area. Cumulative projects would likely have substantial effects on the local economy by increasing the number of residents, jobs, and commerce. For example, the increase in new residential, commercial, and industrial uses could increase the tax base of the affected jurisdictions, which in turn would lead to improved public services (including police, fire, and recreation services). Recreation-related cumulative projects would increase recreation opportunities in the region, which in turn would increase commerce for businesses that cater to recreational users.

The 2007 Final EIS/R concluded that the extent to which the cumulative projects would disproportionately affect minority and low-income communities (environmental justice) over the 50-year planning period cannot be determined. For example, industrial or utilities projects could be constructed near minority or low-income communities, which would result in a disproportionate land use compatibility effects such as air quality, traffic, and noise impacts. Because specific information is not available, it cannot be assumed that cumulative impacts of other cumulative projects would be less than significant. Therefore, it is assumed that the other cumulative projects would have a potentially significant cumulative impact on minority and low-income populations.

Cumulative Impacts of No Action Alternative

Under the No Action Alternative at the southern Eden Landing ponds, no new activities would occur as part of the SBSP Restoration Project. The ponds would continue to be monitored and managed through the activities described in the AMP and in accordance with current USFWS practices. Recreation activities would remain similar to those under existing conditions and would not be expected to change business conditions in the long term. Therefore, no impact to area businesses would occur and the communities would remain similar to existing conditions.

No significant cumulative impacts associated with socioeconomics exist in the project area. Since no impact to area businesses would occur and the communities would remain similar to existing conditions, the contribution of the Eden Landing Phase 2 No Action Alternative to cumulative impacts related to socioeconomics would not be considerable and would not trigger a significant cumulative impact.

Although there are potentially significant cumulative impacts relative to environmental justice in the study region (because specific information is not available, it cannot be assumed that cumulative impacts of other cumulative projects would be less than significant), the Eden Landing Phase 2 No Action Alternative would have no disproportionate effects on low income or minority populations and would not contribute to Environmental Justice cumulative impacts.

Cumulative Impacts of Eden Landing Phase 2 Action Alternatives

The Eden Landing Phase 2 Action Alternatives propose the construction of a range of new recreational and public access facilities at the southern Eden Landing ponds as well as restoration activities. An increase in use of the additional recreational and public access facilities may incrementally increase activity at businesses associated with recreational users. Construction of the Eden Landing Phase 2 Action Alternatives would result in some new recreation facilities. These facilities would primarily be extensions of existing services (e.g., viewing platforms, interpretative stations, and some new trails) and are not expected to substantially increase the recreational uses of the facilities. Business activity at surrounding businesses that cater to these recreational users could expect a slight increase in their business revenues. Further, the planned restoration activities are generally a long-term environmental benefit to surrounding communities in terms of improving water or air quality, maintaining or improving flood protection, and so on.

No significant cumulative socioeconomic impacts exist in the project area. Socioeconomic impacts under the Eden Landing Phase 2 Action Alternatives would generally be beneficial. The contribution of the completed Eden Landing Phase 2 project activities to cumulative impacts regarding socioeconomics would not be considerable and would not trigger a significant cumulative socioeconomic impact.

The Eden Landing Phase 2 Action Alternatives would involve earthmoving activities at the southern Eden Landing ponds that may cause short-term construction disturbance impacts (e.g., noise from construction equipment, increase in dust, and truck traffic). These activities would also occur at some distance from residents and be similarly experienced by non-residents in the nearby business parks and on public roads and trails. Users of these facilities are drawn from the general population. Construction activities would be temporary and generally would not occur exclusively in areas where the minority population is a greater percentage than that of the surrounding cities' populations.

There are potentially significant cumulative impacts relative to environmental justice in the study region (because specific information is not available, it cannot be assumed that cumulative impacts of other cumulative projects would be less than significant). However, the Eden Landing Phase 2 Action Alternatives would have no disproportionate effect on minority or low income communities. Therefore, the contribution of the Eden Landing Phase 2 Action Alternatives to cumulative impacts related to environmental justice would not be considerable.

4.3.10 Traffic

The geographic scope for cumulative traffic impacts includes the South Bay area in the vicinity of Hayward, Union City, and Fremont, as well as surrounding portions of other cities and unincorporated areas within Alameda County. Areas farther away than this from Eden Landing would not experience cumulative traffic impacts from this project. The transportation network in and around the Eden Landing Phase 2 project area at Eden Landing consists of highways, surface streets, bicycle routes, public transit, railways, and air transportation facilities.

Review of the 2007 Final EIS/R and the cumulative projects listed in Table 4-1 indicates that potentially significant cumulative impacts regarding construction-related traffic exist in the study region. The development of future cumulative projects, specifically large-scale residential, commercial, and industrial development as well as restoration and flood control projects, would require construction activities that necessitate the transportation of equipment, machinery, soils, and workers to and from the work sites. Construction-related traffic would be expected to increase on the local and regional transportation network if these projects were to occur simultaneously. Specifically, if all construction-related traffic were to occur during the weekday peak hours, then significant cumulative traffic levels on roadways or intersections could occur, because traffic congestion within the Bay Area occurs primarily during the weekday peak hours. Cumulative projects would likely be scattered both geographically (throughout the entire South Bay) and over time (over the 50-year planning period). Also, construction-related traffic for the cumulative projects would likely occur throughout the day, rather than being concentrated only during the peak hours. However, because the number of construction-related truck trips is not known for the combination of cumulative projects that would be occurring at any given time, potential impacts from other cumulative projects must be assumed to be potentially significant.

The population of the South Bay and Alameda County in particular is expected to increase over the next 25 years. This increase would result in a corresponding increase in long-term traffic volumes. The increase in long-term traffic, particularly during the weekday peak hours, could potentially degrade traffic levels on a roadway or at an intersection. Projects identified in the MTC Transportation 2035 Plan (2009) are intended to maintain, manage, and improve surface transportation in the Bay Area. Project proponents are typically required to mitigate for adverse operational-traffic effects generated by their projects either by improving traffic facilities (e.g., widening roads, installing signals) or contributing to a regional fund for traffic improvements. Although MTC projects and mitigation measures for individual development projects are expected to address the potential for long-term degradation of traffic levels on roadways and intersections, due to the uncertainty of funding for these projects and the actual implementation of mitigation measures by project proponents, potential operational-traffic-related effects from cumulative projects would be potentially significant.

With the exception of worker vehicles that are primarily passenger cars, construction-related vehicles would involve the use of heavy trucks. These trucks would be required to follow the local jurisdictions' designated haul routes to the extent feasible; these routes consist primarily of larger roads capable of handling heavy loads. The increase in truck trips could increase wear and tear on local and regional roadways. Although major arterials and collectors are designed to accommodate a mix of vehicle types, including heavy trucks, residential streets are not designed with a pavement thickness that can withstand substantial truck traffic volumes. Because the increase in construction-related truck traffic traveling on designated routes and road improvements for the cumulative projects is not known, the impacts on roadways from cumulative construction projects would be potentially significant.

Cumulative Impacts of No Action Alternative

Because the No Action Alternative at the southern Eden Landing ponds would not involve construction of new facilities or features within the ponds, no construction-related traffic would be generated. As such, no increase in wear and tear on the designated haul routes during construction would occur under the No Action Alternative. Consequently, the No Action Alternative would not contribute to cumulative impacts.

Operation of the southern Eden Landing ponds under the No Action Alternative would require limited, intermittent vehicular traffic associated with O&M activities over the 50-year planning period; this traffic would constitute a less-than-significant contribution to cumulative impacts.

Although potentially significant cumulative impacts relative to construction traffic exist in the study region, the contribution of the Eden Landing Phase 2 No Action Alternative to cumulative impacts related to traffic would not be considerable.

Cumulative Impacts of Eden Landing Phase 2 Action Alternatives

Implementation of the Eden Landing Phase 2 Action Alternatives would involve several construction activities that generate construction traffic. The construction traffic would be temporary in nature, lasting the duration of the construction phase. Construction activities would generate traffic associated with the transport of materials and equipment at southern Eden Landing , and the delivery of fill material which could be done in a single construction seasons but could also be spread out over two or three seasons, depending on material availability. Truck trips would be required for the transport of equipment at the beginning and end of each construction season and for worker commuting on a daily basis. As discussed in Section 3.11.3, Environmental Impacts and Mitigation Measures, if all material is available at once and delivered as rapidly as possible, there could be up to 200 trips per day for 70 days (in the most extreme Action Alternative). In this case, the trips to deliver this material would contribute to increases in local traffic delays at the I-880 Southbound Ramps / Whipple Road / Dyer Street intersection during peak commute hours.

During construction of the Eden Landing Phase 2 Action Alternatives, construction traffic would be directed to use designated haul routes. The designated access routes are classified as major arterial streets. As such, these roads were designed to withstand substantial truck traffic. If residential streets are part of the designated haul routes, a video record of road conditions would be prepared before the start of construction for the residential streets affected by the project. A similar video of road conditions would be prepared after project construction is completed. An agreement would be entered into before construction that would detail the pre-construction conditions and post-construction requirements of the roadway rehabilitation program.

O&M activities for components of the Phase 2 action would continue as described in the existing regulatory permits, according to maintenance needs identified annually, and as described in Pond Operations Plans, and would be informed by relevant AMP activities. These activities would include pond maintenance, levee maintenance, nesting island maintenance, habitat transition zone maintenance, and maintenance of public access and recreational features. The increase in traffic volumes associated with routine maintenance and monitoring activities would be minimal relative to the baseline.

Under the Eden Landing Phase 2 Action Alternatives, new facilities would be installed to improve recreation and public access. Operation of the new recreational facilities would be anticipated to result in small increases in visitation. However, the increased visitation is not anticipated to result in a substantial increase in vehicle traffic relative to the traffic volumes of the local network. Due to the periodic nature of the O&M traffic, the limited number of trips generated by workers visiting the ponds, and the minimal increase in visitation, the implementation of the Action Alternatives would not result in a substantial increase in traffic volumes compared to the current traffic levels in the area.

There are potentially significant cumulative impacts relative to traffic in the study region. Construction-related traffic would be expected to increase on the local and regional transportation network if the

cumulative projects were to occur simultaneously. Trips resulting from the delivery of equipment and workers during construction could noticeably contribute to local traffic delays. Also, cumulative projects would likely be scattered both geographically (throughout the South Bay) and over time (over the 50-year planning period). There would be very little additional traffic associated with operation of the Eden Landing Phase 2 Action Alternatives. Therefore, the contribution of the Eden Landing Phase 2 Action Alternatives to cumulative impacts related to traffic would not be considerable.

4.3.11 Noise

Noise and vibration impacts are localized such that the geographic area in which cumulative impacts may occur is limited to the vicinity of the proposed project and the areas adjacent to the proposed construction access and haul routes.

Review of the 2007 Final EIS/R and the cumulative projects listed in Table 4-1 indicates that less-than-significant cumulative impacts regarding short-term construction noise exist in the study region. The development of future cumulative projects, specifically large-scale residential, commercial, and industrial development as well as restoration and flood control projects, would require construction activities that generate noise. However, cumulative projects would likely be scattered both geographically (throughout the South Bay) and over time (over the 50-year planning period). Also, because project proponents are required to comply with the requirements of the noise regulations of affected jurisdictions, and exemptions are provided specifically for construction noise, the potential noise effects of cumulative projects during construction would be less than significant.

Cumulative Impacts of No Action Alternative

Under the No Action Alternative, no new construction would occur under Phase 2 and southern Eden Landing would continue to be monitored and managed through the activities described in the AMP and in accordance with current CDFW and ACFCWCD practices.

No significant cumulative impacts associated with noise exist in the project area, and the contribution of the Eden Landing Phase 2 No Action Alternative to cumulative impacts related to noise would not be considerable and would not trigger a significant cumulative impact.

Cumulative Impacts of Eden Landing Phase 2 Action Alternatives

As described above, other cumulative projects in the vicinity of the project area would generally result in less-than-significant, short-term construction noise cumulative impacts because project proponents are required to comply with the requirements of noise regulations of the affected jurisdictions. Further, exemptions are provided specifically for construction noise. Implementation of the Eden Landing Phase 2 Action Alternatives would involve noise-generating construction and earthmoving activities as well as noise related to construction traffic. The Eden Landing Phase 2 project has incorporated programmatic mitigation measure **SBSP Mitigation Measure 3.13-1,** which ensures that construction activities shall be limited to the days and hours or noise levels designated for the local jurisdictions where work activities occur. Therefore, construction activities will not occur during noise-sensitive hours. The Eden Landing Phase 2 project has also incorporated programmatic mitigation measure **SBSP Mitigation Measure 3.13-2,** which requires trucks to avoid residential areas for haul routes to the extent feasible.

Periodic maintenance of the pond infrastructure would be required following construction under the Eden Landing Phase 2 Action Alternatives. Maintenance would require approximately one CDFW staff person

to travel to southern Eden Landing one or two times a week to perform activities such as water control structure operations, predator control, general vegetation control, and vandalism repairs. Also, AMP monitoring activities would occur, which could require additional workers (e.g., staff, scientific researchers) to access the project area. The frequency of visits to conduct AMP monitoring activities would depend on the actual activities and would vary by season (e.g., during the bird breeding season, there could be more trips to the site than during the non-breeding season). However, the number of trips to the project site for maintenance is not expected to increase over the baseline number by more than a few trips per week.

No significant cumulative impacts associated with noise exist in the project area. There would be very little additional noise associated with operation of the Eden Landing Phase 2 Action Alternatives. Construction noise would temporary. Noise resulting from the delivery of equipment and workers during construction would not noticeably increase the ambient noise levels in the project area. Noise from construction activities at the ponds would not exceed the applicable local noise standards. Also, cumulative projects would likely be scattered both geographically (throughout the South Bay) and over time (over the 50-year planning period). Therefore, the contribution of the Eden Landing Phase 2 Action Alternatives to cumulative impacts related to construction-related noise would not be considerable and would not trigger a significant cumulative noise impact.

4.3.12 Air Quality

The geographic study area for cumulative air quality impacts is the area surrounding the proposed construction activities in the ponds and the San Francisco Bay Area Air Basin (SFBAAB) in general. To address cumulative impacts on regional air quality, the Bay Area Air Quality Management District (BAAQMD) has established thresholds of significance for construction-related and operational emissions of criteria pollutants. These thresholds represent the levels at which a project's individual emissions of criteria pollutants and precursors would result in a cumulatively considerable contribution to the region's existing air quality conditions. In developing thresholds of significance for air pollutants, BAAQMD considered the emission levels for which a project's individual emissions would be cumulatively considerable. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions. Therefore, additional analysis to assess cumulative impacts would be unnecessary.

The simultaneous construction of cumulative projects, including residential, commercial, industrial, restoration, flood risk management, and recreation projects, would generate air pollutant emissions, and if these project overlap geographically, could create a significant cumulative impact.

Cumulative Impacts of No Action Alternative

Under the Eden Landing Phase 2 No Action Alternative, no construction activities would occur. Although O&M activities would be ongoing, they would be the same as those that occur now. Further, they are considered part of project operation and not construction. As such, no construction-generated emissions would occur.

Under the No Action Alternative, operations would involve no new activities. Southern Eden Landing would continue to be monitored and managed through the activities described in the AMP and in accordance with current CDFW and ACFCWCD practices. The level of activity would be the same as the activities occurring under existing conditions and would not result in a change in emissions. O&M

activities could require the use of diesel-powered equipment and vehicles that have the potential to generate toxic air contaminant (TAC) emissions. However, the use of this equipment would be limited in extent and occur intermittently and rarely over the multi-decadal lifetime of the project. As such, the potential for exposure of sensitive receptors to TAC emissions from use of diesel-powered equipment and vehicles would be less than significant. Therefore, potential impacts from long-term operational emissions would be less than significant.

Because of existing air quality conditions in the Bay Area, potentially significant cumulative impacts relative to air quality exist in the study region. Under the Eden Landing Phase 2 No Action Alternative, however, the level of activity would be the same as the activities occurring under existing conditions and would not result in a change in emissions. Therefore, the contribution of the Eden Landing Phase 2 No Action Alternative to cumulative impacts related to air quality would not be considerable.

Cumulative Impacts of Eden Landing Phase 2 Action Alternatives

Alameda County is currently designated as a marginal nonattainment area with respect to the national 8-hour ozone standard and as a moderate nonattainment area for the 24-hour fine particulate matter ($PM_{2.5}$) standard. Alameda County is also a maintenance area for carbon monoxide (CO).

Implementation of the Eden Landing Phase 2 Action Alternatives could involve the beneficial reuse of dredge materials; levee breaches; lowering, removal, or improvement of levees; excavation of channels; construction of habitat islands and habitat transition zones; installation of water control structures; and construction of public access and recreational facilities. The dredge material component of the construction would likely last 74 to 93 months and other construction activities would likely last 27 to 29 months, depending on the alternative chosen, but the traffic, noise, air quality, and greenhouse gas impacts analysis assumed a shorter and more concentrated construction period. Construction activities would result in the temporary generation of emissions from earthmoving activities; exhaust from off-road equipment, material hauling, worker commute activity; and other miscellaneous activities.

As shown in Section 3.13, Air Quality, construction-generated daily emissions of reactive organic gases (ROGs), respirable particulate matter (PM_{10}) exhaust, and $PM_{2.5}$ exhaust would not exceed the applicable regional significance thresholds. Annual emissions of ROGs, CO, and $PM_{2.5}$ would not exceed applicable *de minimis* thresholds for general conformity. Therefore, construction of the Eden Landing Phase 2 Action Alternatives would conform to the State Implementation Plan (SIP) for these parameters.

Construction-generated average daily NO_x emissions would exceed applicable regional significance thresholds during import and placement of dredge materials. Project-specific mitigation measures will be used to reduce NO_x emissions to the greatest extent feasible for those options where diesel fuel is used to power the offloading facility and booster pumps during import and placement of dredge materials, but NO_x emissions would still exceed the regional threshold of significance. By its very nature, air pollution is largely a cumulative impact. If a project exceeds the identified significance thresholds, its emissions would be cumulatively considerable, resulting in significant adverse air quality impacts to the region's existing air quality conditions. The regional thresholds of significance set forth by BAAQMD are considered the emission levels for which a project's individual emissions would be cumulatively considerable. Therefore, significant and unavoidable cumulative impacts for NO_x emissions would occur for each Action Alternatives if diesel fuel is used to power the offloading facility and booster pumps during import and placement of dredge materials.

Annual NO_x emissions would be below general conformity *de minimis* levels with incorporation of the project-specific mitigation measures. Therefore, construction-related emissions associated with diesel-powered construction equipment would conform to the SIP, and a formal conformity analysis would not be required.

Earthmoving activities would result in temporary construction fugitive dust emissions that have the potential to represent a significant impact with respect to air quality. Project design features include several dust control measures that would meet the BAAQMD's current Basic Construction Mitigation Measures Recommended for All Proposed Projects from the 2011 Guidelines (BAAQMD 2011), and therefore the Action Alternatives would not result in significant fugitive dust impacts.

Because the construction activities associated with the Eden Landing Phase 2 Action Alternatives would conform to the SIP, result in construction-generated emissions that would not exceed a significance threshold, incorporate program and project-specific mitigation measures to reduce construction-generated emissions to the greatest extent feasible, and include adequate fugitive dust control measures, the short-term construction-generated air pollutant emissions resulting from the Eden Landing Eden Landing Phase 2 Action Alternatives for ROGs, CO, PM_{10} and $PM_{2.5}$ would be less than significant.

Operations under the Eden Landing Phase 2 Action Alternatives would be similar to existing conditions and would not result in a substantial increase in emissions compared to the existing operational activity. Therefore, the potential impacts from long-term operational emissions would be less than significant for all Eden Landing Phase 2 Action Alternatives.

The BAAQMD's CEQA Guidelines also require evaluation of the project's contribution to cumulative TAC exposure of sensitive receptors (including schools, hospitals, and residential areas) in the project vicinity by considering all sources within 1,000 feet of the project site. In accordance with these guidelines, a project would have a cumulatively considerable impact if the total of these local sources plus the contribution from the project exceeds BAAQMD's cumulative risk and hazard thresholds of 100 in a 1 million excess cancer risk, a Hazard Index (chronic and acute non-cancer risks) of 10, or an annual average $PM_{2.5}$ concentration of 0.8 micrograms per cubic meter ($\mu g/m^3$).

Construction of the Eden Landing Phase 2 Action Alternatives would result in short-term diesel exhaust emissions from on-site heavy duty equipment. Sensitive receptors (residences) are approximately 1,000 feet away from the eastern boundary of major project activities at southern Eden Landing. BAAQMD recommends that a site screening be conducted to determine if the project would result in the receptors being within 1,000 feet of a particulate matter (PM) or TAC source. Construction would occur throughout southern Eden Landing, and many construction activities would occur at distances much greater than 1,000 feet from these receptors. Because of the distance of these sensitive receptors and the temporary use of off-road construction equipment, short-term construction activities would not expose sensitive receptors to substantial TAC emissions. In addition, construction activities at the Bay Trail spine would occur away from the main project boundary and extend to areas located in the vicinity of other sensitive receptors (also residences). These residences are located less than 100 feet from where the Bay Trail spine would be placed on existing levees along the eastern edge of northern Eden Landing. The construction activities at these existing levees would be minimal, and would only be anticipated to take no more than 8 weeks to complete. Because the generation of TACs from these activities would be temporary and would only occur within an influential distance of sensitive receptors over a short amount of time, these activities would not be anticipated to result in the exposure of sensitive receptors to substantial concentrations. Furthermore, Office of Environmental Health Hazard Assessment indicates that an

evaluation of cancer risk is would not be recommended for exposure from projects lasting less than two months (OEHHA 2012). Therefore, short-term construction activities would not expose sensitive receptors to substantial PM and TAC emissions.

Project design features for the Action Alternatives would include requirements for the preparation of a Health and Safety Plan that would reduce the potential for workers and nearby residents to be exposed to airborne TACs entrained in fugitive dust during construction.

None of the cumulative projects are within close proximity to the southern Eden Landing and the air quality effects would not overlap with the Maximally Exposed Individual potentially affected by the Eden Landing Phase 2 Action Alternatives. Therefore, the project's contribution to cumulative risk and hazard impacts would not be cumulatively considerable.

The only criteria pollutant emissions associated with operation of the project would result from maintenance traffic and activities and would remain similar to those associated with existing maintenance activities. Therefore, there would not be a substantial increase in operational risk and hazard impacts associated with operation of the project, and the project would not have a cumulatively considerable contribution to the region's existing air quality conditions as a result of project operation. Visits to some of the Phase 2 Eden Landing ponds could increase somewhat following the addition of some new public access and recreation opportunities, but emissions from these visits would be not be a substantial increase compared to the background emissions that already exist.

O&M activities would require the use of diesel-powered equipment and vehicles that have the potential to generate TAC emissions. However, the use of this equipment would be limited in extent and occur intermittently over the lifetime of the project and would not substantially differ from existing O&M activities. As such, the potential increased exposure of sensitive receptors to TAC emissions during operations would not occur.

Given the use of a Health and Safety Plan, the great distances, intermittent nature of operational activities, the impacts to sensitive receptors from the Eden Landing Phase 2 Action Alternatives would be less than significant.

Although there are potentially significant cumulative impacts relative to air quality in the study region, because the potential increased exposure of sensitive receptors to TAC emissions during operations would not occur, the contribution of the Eden Landing Phase 2 Action Alternatives to cumulative impacts related to air quality would not be considerable.

4.3.13 Public Services

The geographic scope for cumulative impacts on public services includes the cities and communities where the proposed project and cumulative projects would be located (the cities of Hayward, Union City, and Fremont).

Review of the 2007 Final EIS/R and the cumulative projects listed in Table 4-1 indicates that less-than-significant cumulative impacts regarding public services exist in the study region. Development and operation of many cumulative projects, particularly residential, commercial and industrial projects, would increase the demand for fire and police protection services. Municipalities respond to increases in demand for emergency services by expanding their fire and police protection departments to keep with their service ratio goals. As part of this response, municipalities plan to ensure that sufficient services are

provided for future growth. Therefore, impacts on fire and police protection services from cumulative projects would be less than significant.

Cumulative Impacts of No Action Alternative

Under the Eden Landing Phase 2 No Action Alternative, southern Eden Landing and its surroundings would continue to be monitored and managed through the activities described in the AMP and in accordance with current practices. No new public services facilities would be provided under the No Action Alternative; thus, there would be no substantial increases in visitor use or increased demand for fire and police protection services. Similarly, the habitat restoration actions and the various flood protection actions would not change the demand for public services or the ability of agencies to provide them.

No significant cumulative impacts associated with public services exist in the project area, and the contribution of the Eden Landing Phase 2 No Action Alternative to cumulative impacts related to public services would not be considerable and would not trigger a significant cumulative impact.

Cumulative Impacts of Eden Landing Phase 2 Action Alternatives

Under the Eden Landing Phase 2 Action Alternatives, some ponds would be breached to introduce tidal flows, others may be retained and enhanced as managed ponds, and other habitat enhancement features would be added. Existing trails on many of the levees would continue to be maintained, and construction of the Eden Landing Phase 2 Action Alternatives would also result in new recreation facilities. These facilities would be primarily an extension of existing services (e.g., viewing platforms and trails) and would not be expected to substantially increase the need for police and fire protection services in a manner that would require new facilities or additional staff. The proposed recreation facilities would be designed in a manner that would facilitate the movement of emergency service providers in the event of an emergency (e.g., sufficient trail width to accommodate vehicles and provision of entrances). The Eden Landing Phase 2 Action Alternatives would not be expected to increase the need for public services to such an extent that they would cause a reduction in the acceptable response time or outpace natural growth in the region and require construction of new police and fire protection stations.

No significant cumulative impacts associated with public services exist in the project area. The Eden Landing Phase 2 Action Alternatives would not be expected to increase the need for public services to such an extent that they would cause a reduction in the acceptable response time or outpace natural growth in the region and require construction of new police and fire protection stations. The contribution of the Eden Landing Phase 2 Action Alternatives to cumulative impacts related to public services would not be considerable and would not create a significant cumulative impact.

4.3.14 Utilities

The geographic scope for cumulative impacts on utilities includes the cities and communities where the proposed project and cumulative projects would be located (the cities of Hayward, Union City, and Fremont, all of which are in Alameda County).

The types of projects listed in Table 4-1 that could contribute to cumulative impacts associated with utilities include flood protection projects and development projects. Review of the 2007 Final EIS/R and the cumulative projects listed in Table 4-1 indicates less-than-significant cumulative impacts regarding utilities exist in the study region except for potential effects to storm drains. Tidal inundation of ponds as

a result of unplanned levee breaches, along with other tidal habitat restoration projects, could contribute to reduced access to PG&E towers in the baylands at a time when continued population growth in the Bay Area is expected to increase the demand on these facilities. Other types of cumulative projects are not expected to contribute to reduced access to PG&E towers in the baylands. Other tidal wetland restoration projects are in areas containing towers for power transmission or distribution lines and may result in reduced PG&E access. The number of towers in these tidal restoration areas is small compared to the total number of towers in the South Bay and compared to the number of towers PG&E maintains in existing tidal areas. Impacts at restoration locations where the towers can be accessed by road are expected to be negligible. Therefore, cumulative projects would not significantly reduce access to PG&E towers in the South Bay.

Unplanned breaches in other portions of the SBSP Restoration Project area could affect storm drains in the vicinity of those breaches, and storm drain improvements implemented as part of other projects in the area would not offset adverse effects in these areas. These cumulative impacts would therefore be potentially significant.

Other cumulative projects are not expected to result in changes in water level, tidal flow, or sedimentation near pumping facilities and sewer force mains and outfalls.

Other cumulative projects are not expected to disrupt Hetch Hetchy Aqueduct services and are not expected to disrupt rail service.

Cumulative Impacts of No Action Alternative

Under the Eden Landing Phase 2 No Action Alternative, no new activities would be implemented as part of Phase 2. The southern Eden Landing ponds would continue to be managed through the activities described in the AMP and in accordance with current CDFW practices. In addition to levee maintenance, PG&E tower improvements would be made as part of routine maintenance, to comply with PG&E's internal requirements, and/or to adapt to sea-level rise. These improvements may involve raising towers and/or raising and strengthening the foundations or superstructures of towers. Because of the continued maintenance of levees and ponds and improvements planned for the towers under the NERC program, PG&E's ability to access existing towers via levees and boardwalks would be maintained.

Unplanned levee breaches could temporarily affect water level, tidal flow, and sedimentation near storm drain systems, but no changes are expected to water surface elevations during high tide. Therefore, any potential changes resulting from unplanned breaches are not expected to affect the ability to operate storm drain systems.

Impacts resulting from changes in water level, tidal flow, or sedimentation near pumping facilities would be less than significant. There are no sewer force mains or outfalls in close proximity to any of the Phase 2 Eden Landing ponds. Therefore, there would be no potential for changes in water level, tidal flow, or sedimentation near sewer force mains and outfalls.

The Eden Landing Phase 2 No Action Alternative would have no impacts regarding disruption of rail service.

There are potentially significant cumulative impacts relative to changes in water level, tidal flow, and sedimentation near storm drain systems in the study region. Unplanned breaches in other portions of the SBSP Restoration Project area could affect storm drains in the vicinity of those breaches. Under the Eden

Landing Phase 2 No Action Alternative, unplanned levee breaches could temporarily affect water level, tidal flow, and sedimentation near storm drain systems, but no changes are expected to water surface elevations during high tide. Therefore, any potential changes resulting from unplanned breaches are not expected to affect the ability to operate storm drain systems. Therefore, the contribution of the Eden Landing Phase 2 No Action Alternative to cumulative impacts related to storm drain systems would not be considerable.

No significant cumulative impacts associated with other utilities exist in the project area. Under the Eden Landing Phase 2 No Action Alternative, the existing access to PG&E's transmission towers would be maintained. Operation of storm drain systems are not expected to be affected. No sewer force mains or outfalls are within any of the southern Eden Landing ponds. Therefore, the contribution of the Eden Landing Phase 2 No Action Alternative to cumulative impacts related to other utilities would not be considerable and would not trigger a significant cumulative impact.

Cumulative Impacts of Eden Landing Phase 2 Action Alternatives

Under the Eden Landing Phase 2 Action Alternatives, one PG&E distribution line and the wooden poles supporting it would be removed, because it would no longer be necessary. A second (and only other) PG&E line would be retained on the existing levee, along with whatever improvements to the pole foundations are necessary. No changes to the access to this line would be made. There would be no changes to storm water management, or other utilities are planned at most of the ponds.

Other potential impacts to utilities include sedimentation near storm drain systems, pumping facilities, and sewer force mains and outfalls; disruption to Hetch Hetchy Aqueduct service; disruption of rail service; and reduced access to sewer force mains. However, as with the Eden Landing Phase 2 No Action Alternative, none of the Eden Landing Phase 2 Action Alternatives would directly affect or modify these systems, impair the functioning or operation and maintenance of these systems or their infrastructure, or otherwise adversely affect them.

There are potentially significant cumulative impacts relative to changes in water level, tidal flow, and sedimentation near storm drain systems in the study region. Unplanned breaches in other portions of the SBSP Restoration Project area could affect storm drains in the vicinity of those breaches. Overall, the expected changes in water levels and sedimentation patterns associated with the Eden Landing Phase 2 Action Alternatives are not expected to substantially affect the operation of storm drain systems or pumping facilities. Therefore the contribution of the Eden Landing Phase 2 Action Alternatives to cumulative impacts related to storm drain systems would not be considerable.

No significant cumulative impacts associated with other utilities exist in the project area. The Eden Landing Phase 2 Action Alternatives would have no impacts to the other utilities in the project area (i.e., electrical transmission lines, towers, sewer force mains, Hetch Hetchy Aqueduct, or rail). As such, the contribution of the Eden Landing Phase 2 Action Alternatives to cumulative impacts related to utilities would not be considerable and would not create a significant cumulative impact.

4.3.15 Visual Resources

The geographic scope for the visual resources cumulative impact analysis consists of the immediate, publicly viewable area within or surrounding the existing salt ponds.

Review of the 2007 Final EIS/R and the cumulative projects listed in Table 4-1 indicates potentially significant visual resources cumulative impacts exist within the study region. Cumulative projects (including residential, commercial, industrial, flood control, restoration, and recreation projects) would alter views of the South Bay, including the SBSP Restoration Project area, through construction of new facilities (e.g., buildings, recreational features, levees, floodwalls) or expansion of existing facilities (e.g., expansion of commercial centers). For those cumulative impact projects that would include features that could alter views, these changes would be required to comply with applicable government policies and guidelines related to aesthetic resources pertaining to the location of development, height restrictions, and architectural design. These policies and guidelines are intended to limit development of incongruous visual features and maximize visual integration. Flood protection projects and development projects could construct facilities that would obstruct scenic views. Because it is not known whether the cumulative projects would obstruct views or where facilities obstructing views would be constructed, the potential effects on views cannot be evaluated. Consequently, for this analysis, it is assumed that impacts on views resulting from cumulative projects would be potentially significant.

Cumulative Impacts of No Action Alternative

Under the No Action Alternative, the ponds at southern Eden Landing would continue to be managed through the activities described in the AMP and there would be no alteration of views in the Phase 2 Eden Landing SBSP Restoration Project area.

Although there are potentially significant cumulative impacts relative to visual resources in the study region, the contribution of the Eden Landing Phase 2 No Action Alternative to cumulative impacts related to visual resources would not be considerable.

Cumulative Impacts of Eden Landing Phase 2 Action Alternatives

Some of the Eden Landing Phase 2 Action Alternatives would open some ponds to tidal flows to restore them to tidal marsh, improve levees to provide additional flood protection, create habitat transition zones and other habitat enhancement features, increase pond connectivity, and add or improve public access features. The major effect of these actions would be the creation of tidal marsh habitat, which would change the visual environment of the southern Eden Landing ponds in various ways. At Eden Landing, the Action Alternatives would change the Bay Ponds from deepwater ponds to vegetated marshes, which would alter the texture and color of the views. The Inland Ponds and the Southern Ponds, would change these seasonal and managed ponds to either vegetated marshes or enhanced managed ponds (depending on the alternative selected), which would alter the texture and color of the views.

There are potentially significant cumulative impacts relative to visual resources in the study region. Cumulative projects would alter views of the South Bay, including the SBSP Restoration Project area, through construction of new facilities or expansion of existing. The Eden Landing Phase 2 Action Alternatives would create a less than significant impact to visual resources by altering the texture and color of the views and introducing a minor visual change. Although this represents a change to the visual character, this very minor change to the visual character of the study region as a whole would not be a considerable contribution to the cumulative impact.

4.3.16 Greenhouse Gas Emissions

Because GHG emissions affect global climate change, the evaluation of GHG emissions is inherently a cumulative impact issue. However, it is not feasible to evaluate GHG emissions impacts based on the sum

of all past, present, and reasonably foreseeable future projects on a global scale. Therefore, the geographic scopes for cumulative GHG emissions impacts are the SFBAAB and the state of California as a whole.

Cumulative Impacts of No Action Alternative

Under the No Action Alternative, no construction activities would occur within the southern Eden Landing ponds. Although limited O&M activities would be ongoing, they are considered part of baseline operations, not construction. As such, no additional construction-generated GHG emissions would occur. Operations under the No Action Alternative would involve limited O&M activities, such as levee repair, railroad track maintenance, and biological surveys. These activities would occur intermittently over the 50-year lifetime of the project. O&M activities would generate GHG emissions associated with the use of vehicles and other equipment. However, the level of activity would be similar to the O&M activities occurring under existing conditions and would not result in a substantial increase in GHG emissions compared to the existing operational activity. Therefore, potential impacts from long-term operational GHG emissions under the No Action Alternative would be less than significant and would not make a considerable contribution to a cumulative impact.

Cumulative Impacts of Eden Landing Phase 2 Action Alternatives

Implementation of the Eden Landing Phase 2 Action Alternatives would involve GHG-emitting activities such as levee improvements, creation of nesting islands, creation of habitat transition zones, and construction of recreational facilities. Close to 100,000 cubic yards of material would be transported from off-site locations, depending on the alternative selected. The Eden Landing Phase 2 Action Alternatives would generate construction-related GHG emissions from off-road construction equipment, material hauling, and worker commute activity.

The environmental impacts of GHG emissions are long-term and global in nature. For that reason, unlike any of the other environmental resources or impacts analyzed in this EIR, it is useful to include an estimate of the maximum GHG emission from the combined actions at southern Eden Landing. Assuming the Action Alternative with the most GHG emissions is selected, the estimated GHG emissions values from Table 3.17-1 (in Section 3.17) can be used to analyze this highest potential emissions scenario. As in that section, the construction GHG emissions from the most highly emitting alternatives were summed and amortized over the 50-year lifetime of the project. The estimated GHG emissions from construction actions under Alternative Eden D is 694 metric tons of CO_2e. Amortized over the 50-year project lifetime, this sum is 14 metric tons of CO_2e per year. This value for amortized construction GHG emissions would not exceed the bright line emissions threshold of 1,100 metric tons of CO_2 per year, which is the applicable regional significance threshold, and would thus be less than significant.

Further, the restored tidal marshes are projected to be a net absorber of carbon dioxide, the most common GHG, which would reduce the net emissions from the project. Relative to the overall emissions of GHGs in the southern portions of the SFBAAB and in California as a whole, the GHG emissions from Eden Landing Phase 2 Action Alternatives are extremely minor. As a result, this impact would be less than significant and would not make a considerable contribution to a cumulative impact.

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