4. CUMULATIVE IMPACTS

4.1 Introduction

The National Environmental Policy Act (NEPA) regulations (40 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 non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor collectively significant actions taking place over a period of time." The California Environmental Quality Act (CEQA) provides a similar definition of cumulative impacts. For the purposes of this Environmental Impact Statement/Environmental Impact Report (EIS/R), cumulative effects would be significant if the SBSP Restoration Project's incremental effect, 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]).

A list of past, current and probable future projects was compiled for the cumulative setting. These projects (cumulative projects) include other tidal restoration projects in the San Francisco Bay Area which could result in similar impacts and benefits as those of the South Bay Salt Pond (SBSP) Restoration Project. Other cumulative projects which were considered include:

- Related projects discussed in Chapter 1, Introduction, including the Shoreline Study, the Initial Stewardship Plan (ISP), the Invasive Spartina Project, the Eden Landing Ecological Reserve (ELER) Restoration Project, the Alviso Slough Restoration Project, and the Lower Guadalupe River Flood Protection Project;
- Other projects proposed by the United States Army Corps of Engineers (Corps), US Fish and Wildlife Service (USFWS) or California Department of Fish and Game (CDFG) within and around the Project Area;
- City and county development projects (*e.g.*, new or expanded residential, commercial, or industrial development projects);
- Regional and local agency infrastructure projects (*e.g.*, water and wastewater facilities construction and/or improvements and flood protection projects); and
- Pacific Gas & Electric Company (PG&E) projects (*e.g.*, transmission lines/facilities construction and/or improvements; and operations and maintenance [O&M]).

In addition, regional plans were reviewed to characterize development trends and growth projections in the South Bay over the long-term 50-year planning period.

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.

4.2 Cumulative Setting

The cumulative setting includes a program-level component that addresses long-term cumulative projects and trends expected to occur over the next 50 years as well as a project-level component that identifies past, present and reasonably foreseeable future projects that are planned in the near-term (within approximately 10 years).

Many of the local, regional and state agencies identify projects in their planning documents. General plans of local jurisdictions normally cover a 20-year planning period. Most of the projects identified in the general plans would be implemented within five to 10 years. In some cases, long-term development or infrastructural projects within a city or county are identified in general plans. The land use designation maps included in each general plan also illustrate the development strategy within the city or county.

Other development projects are identified in lists of current projects maintained by the community development or planning departments of each local agency. These project lists are periodically updated. Public works and other infrastructural projects are typically identified in capital improvement plans (CIPs). CIPs identify projects likely to occur within a five-year period based on the availability of funding.

As explained in Chapter 2, Description of Alternatives, the SBSP Restoration Project would consist of a series of phases that would be implemented over a 50-year planning period, which is beyond the planning periods of most agencies. Due to the phased nature of the Project, cumulative projects currently identified by local, regional, state, and federal agencies may not be relevant by the time each phase is implemented (because other cumulative projects may either not occur concurrently or within the same geographic zone as subsequent phases of the proposed SBSP Restoration Project). Due to the extended planning horizon of the Project, and the anticipated changes to the agency project lists and/or CIPs, a list of cumulative projects based on these documents would not provide cumulative setting information for the entire 50-year planning period addressed in the program-level evaluation of cumulative impacts. While the list of cumulative projects is considered in the program-level impact analysis, it is most relevant to the project-level evaluation, which considers the Phase 1 actions together with other projects that would be implemented in the near term. Also, as future project-level phases of the SBSP Restoration Project move forward, cumulative impact analyses will be conducted as part of the project-level NEPA/CEQA compliance, as appropriate.

For the program-level cumulative setting, it is impossible to identify every project that will occur over the next 50 years. As such, an alternate approach to characterizing development potential is needed to evaluate potential long-term cumulative impacts. Relevant regional plans were reviewed to identify development and growth predictions in the South Bay. These regional plans provide an understanding of the predicted changes that would occur in the three affected South Bay counties where the Project Area is located, and in some cases, a list of future projects that are likely to occur. Future projects or strategies for development (as illustrated in land use designation maps) presented in local general plans are not specifically discussed in the program-level cumulative setting, as these have been captured by regional plans, as explained further below.

For project-level cumulative setting, the projects identified in local general plans, CIPs, and other project lists within the same geographic context as the Phase 1 actions would be applicable due to the similarity in timeframe of these projects.

The cumulative projects and regional trends and projections that are applicable to the long-term alternatives and the near-term Phase 1 actions are discussed below.

4.2.1 Program-level Cumulative Setting

As discussed above, the development plans and specific cumulative projects that would be implemented over the 50-year planning period for the SBSP Restoration Project are not known. Consequently, a detailed list of cumulative projects was not compiled for the program-level cumulative setting. Instead, regional plans and regulations were reviewed to understand the changes and projects that are likely to occur in the region over the long term. These plans, described in further detail below, include the following:

- Association of Bay Area Governments (ABAG) Projections 2005;
- Metropolitan Transportation Commission (MTC) Regional Transportation Plan;
- California Air Resources Board (CARB) California Almanac of Emissions and Air Quality and Assembly Bill 32;
- Bay Area Air Quality Management District (BAAQMD) Ozone Strategy and Clean Air Plan;
- U.S. Environmental Protection Agency (USEPA) Long-Term Management Strategy for Dredge Material;
- Water Quality Objectives/Total Maximum Daily Loads (TMDL) (303 (d) list of impaired waterbodies);
- National Pollutant Discharge Elimination System (NPDES) General Permit for Construction-related Stormwater Discharges;
- Other regional projects; and
- PG&E O&M Activities.

As noted above, the cumulative projects discussed in the project-level cumulative setting are also considered part of the program-level cumulative setting.

ABAG Projections 2005

Cumulative projects over the long term are linked with projected growth that is forecasted in the SBSP Restoration Project vicinity, because growth represents anticipated development potential. Growth is tied to new residential, commercial, and infrastructural development. It may also be linked to industrial development as new work opportunities also bring in people. ABAG's Projections 2005 provides a forecast of the regional economic and demographic trends in the San Francisco Bay Area through 2030. The projections are based on the assumptions of local and regional policies, land use, economics, transportation, and demographics. These inputs are drawn from various sources, including but not limited

to city and county general plans, local zoning regulations, building permit allocation measures and growth initiatives adopted by the region's jurisdictions, MTC's Regional Transportation Plan, US Census, Congressional Budget Office, and the state Department of Finance. It should be noted that MTC and BAAQMD incorporate ABAG projections, particularly for jobs, households, and population, as inputs for their respective modeling.

Population and housing growth in the three counties where the SBSP Restoration Project Area is located are shown in Tables 4-1 and 4-2. In addition, Tables 4-3 and 4-4 identify the population and household trends for the specific cities adjacent to the SBSP Restoration Project pond complexes. With the exception of Union City and San Jose, the population and number of households in the region is forecasted to change at an annual rate of approximately one percent or less. Although these forecasts do not specifically call out the projects that would be implemented over the 25-year forecast horizon, they do

Table 4-1 Population Projections by County

COUNTY	2005	2030	PERCENT CHANGE
Alameda	1,517,100	1,884,600	24
Santa Clara	1,750,100	2,267,100	30
San Mateo	723,200	848,400	17
Source: ABAG 2005			

Table 4-2 Household Projections by County

COUNTY	2005	2030	PERCENT CHANGE
Alameda	542,540	677,400	25
Santa Clara	595,550	762,720	28
San Mateo	261,280	305,390	17
Source: ABAG 2005			

Table 4-3 Population Projections by City

CITY	2005	2030	PERCENT CHANGE
Hayward	146,300	170,700	17
Union City	71,400	94,100	32
Fremont	211,100	257,200	22
Mountain View	71,900	88,300	23
San Jose	935,300	1,273,200	36
Sunnyvale	131,700	155,100	18
Menlo Park	30,800	36,200	18
Source: ABAG 2005			

Table 4-4 Household Projections by City

CITY	2005	2030	PERCENT CHANGE
Hayward	46,200	54,080	17
Union City	19,640	26,060	33
Fremont	69,830	84,660	21
Mountain View	32,140	39,420	23
San Jose	293,600	397,230	35
Sunnyvale	53,100	62,200	17
Menlo Park	12,450	14,620	17

Source: ABAG 2005

provide an overall understanding of the expected development potential for the subregional areas. During this period, it is expected that development projects (including residential, commercial, industrial, and infrastructure development) would occur in line with the increase in population. However, the precise location of this growth within each city cannot be determined at this time.

Metropolitan Transportation Commission

The MTC's *Mobility for the Next Generation, Transportation 2030 Plan for the San Francisco Bay Area* (February 2005), developed based on ABAG's Projections 2003, charts a 25-year course for transforming the Bay Area transportation system. The Transportation 2030 Plan proposes three broad approaches to enhance mobility and improve access: adequate maintenance, system efficiency, and strategic expansion (MTC 2005). The Plan identifies a list of multi-county and specific county projects to achieve these goals (see Appendix M). These projects could be implemented through 2030. Not all of the MTC projects are construction-related projects that would contribute to the cumulative impacts. Also, it is unlikely that all of the projects would be implemented due to budget constraints. However, it is expected that a number of construction-related projects would occur within the same geographic context as that of the proposed SBSP Restoration Project and concurrently with the construction of SBSP Restoration Project phases. Thus, these projects are included in the cumulative analysis.

California Air Resources Board

The California Almanac of Emissions and Air Quality, 2006 Edition is prepared by CARB to document current and historical air quality and emissions in California. It also identifies air quality trends. According to the almanac, the emission levels for nitrogen oxides (NO_x,) reactive organic gases (ROG), and carbon monoxide (CO) have been trending downward in the San Francisco Bay Area Air Basin (SFBAAB) since 1975 (CARB 2006a). On-road motor vehicles are the largest contributors to these emissions in the SFBAAB; the implementation of stricter mobile source emission standards is expected to continue to decrease vehicle emissions in the SFBAAB through 2020. Controls on stationary source solvent evaporation and fugitive emissions will also continue to reduce ROG emissions through 2020. PM_{10} and $PM_{2.5}$, on the other hand, are expected to increase through 2020. This increase is due to growth in emissions from area-wide sources, primarily fugitive dust sources. Emissions of directly emitted PM_{10}

and $PM_{2.5}$ from diesel motor vehicles have been decreasing since 1990 even though population and VMT are growing, due to the adoption of more stringent emission standards. For the purposes of this analysis, the pollutant emissions generated by other cumulative projects are expected to be captured in the forecasts.

On August 30, 2006, the Governor of California signed Assembly Bill (AB) 32 (Health and Safety Code section 38501, subdivision (a)), legislation intended to combat global climate change. AB 32 recognizes the threat of global climate change to the economic well-being, public health, natural resources, and the environment of California and identifies potential adverse impacts of global climate change that range from air quality problems to impacts on California's industries (*e.g.*, agriculture, wine, and tourism). Although global climate change is an international issue, the intent of AB 32 is for California to exercise its authority to reduce greenhouse gas emissions and encourage other states, the federal government, and other countries to act. AB 32 gives CARB the authority to coordinate with stakeholders to implement this division, which includes developing emissions reduction measures with the California Public Utilities Commission.

Currently, there are no regulatory standards issued by the state on how global climate change should be addressed and evaluated in its environmental review process. It is anticipated that CARB will develop and enforce mitigation strategies in accordance with AB 32. As these strategies are developed, the SBSP Restoration Project will be analyzed for consistency with CARB measures in subsequent project-level environmental documentation. As it currently stands, it would be speculative to make conclusions about the effects of global climate change resulting from the Project without clear quantitative baseline data about the existing pollutants that contribute to global climate change and established thresholds against which to analyze such changes. However, it is likely that the Project would sequester extensive carbon due to the increase in marsh vegetation associated with restoration activities. Tidal marshes of the bay are incredibly productive habitats. Atwater and others (1979) summarized existing studies and note that "the vascular plants of the estuaries tidal marshes average between 500 and 1500 g/m^2/year. Selecting 800 g/m^2/year as a typical value, and multiplying by the present area of tidal marsh yields an estimated above-ground primary productivity of 10^{11} g/yr." They further note that carbon constitutes about 40% of the dry organic matter of this productivity. Using this same average productivity, and the potential ~13,000 acres (~5200 ha) of tidal restoration would yield about 5.2×10^7 g/yr of above ground productivity, or 2.1×10^7 g of carbon sequestered per year. The effects of climate change and sea level rise on the Project over the 50-year planning period were taken into account by including these factors in the modeling efforts conducted for the design of the restoration activities. The proposed improvements, including new levees that provide flood protection, would be sized to account for the change in sea level that is expected to occur over the 50-year planning period.

Bay Area Air Quality Management District

ABAG's projections for population growth and development are used by the BAAQMD to estimate future emissions of air pollutants, and thus to develop strategies to achieve ambient health-based air quality standards. The BAAQMD produced the 2005 Ozone Strategy (January 2006), which is a comprehensive document that describes the Bay Area's strategy for compliance with the state's one-hour ozone standard. In addition, the BAAQMD prepared a 2000 Clean Air Plan (CAP) (December 2000) that

is intended to reduce emissions of certain air pollutants, in particular, reactive organic gases and nitrogen oxides that lead to the formation of ozone (BAAQMD 2000). The CAP identifies feasible measures that are reasonable and necessary, capable of being implemented, and approved or approvable by CARB to reduce ozone precursor pollutant emissions as quickly as possible. Because these plans take into account the ABAG projections, it is assumed that the pollutant emissions generated by other cumulative projects are expected to be captured in the forecasts.

Other Regional Projects

Other projects that are considered for this cumulative impact evaluation include the USEPA Long-Term Management Strategy for Dredged Material and the National Aeronautics and Space Administration (NASA) Ames Development Plan.

The Long-Term Management Strategy for Dredged Material identifies options that guide federal dredged material disposal decisions in the San Francisco Bay region over a 50-year planning horizon (USEPA 1999). The preferred alternative emphasizes beneficial reuse and ocean disposal of dredged material, with limited in-Bay disposal. Specifically, the alternative calls for 20 percent in-Bay disposal, 40 percent ocean disposal, and 40 percent upland/wetland reuse. This alternative provides the greatest amount of reuse for habitat restoration (which can benefit water quality, fish, wildlife habitat, and special-status species) or other projects such as levee maintenance or construction fill (flood control benefits).

The NASA Ames Development Project would transform the 500-acre NASA Ames Research Center and the 1,500-acre former Naval Air Station Moffett Field into an integrated research and education community (NASA Ames Research Center 2002). It would consist of a 213-acre NASA Research Park (including laboratories, office space, classrooms, auditoriums, museums, conference center, open space, burrowing owl preserve, parking and limited retail facilities), 234 acres of research facilities (laboratories, wind tunnels, flight simulators, test facilities and computing systems), 95 acres of mixed-density housing with recreational facilities, and a wetland area.

PG&E Operations and Maintenance Activities

Under current conditions, PG&E conducts regular O&M at its facilities in ponds within the Project Area on the Refuge. These planned and unplanned activities, which require the notification of and a Special Use Permit from USFWS with implementation of a variety of best management practices that protect sensitive biological resources and other conditions, are itemized below:

- Scheduled line patrol and tower inspection (via foot, vehicle, helicopter, boat);
- Scheduled line work (reconductor, replace damaged conductor, splice damaged conductor, replace insulators, shoofly);
- Scheduled tower maintenance (replace damaged steel, replace damaged tower, repair concrete footing, replace damaged footing, raise or otherwise modify tower, concrete footing repair, concrete footing replacement);
- Access road maintenance (blade top of levee, mow vegetation, rut repair);

- Boardwalk maintenance (replace broken planks, rebuild, raise, overbuild or relocate boardwalk); and
- Unscheduled emergency work to mitigate any unplanned event that could result, or has resulted, in (a) a hazard to the public, employees, or the environment; (b) material loss to property; or (c) a detrimental effect on the reliability of any electric or natural gas system. (Emergency, which may be a natural or human caused event, may be confined to the utility infrastructure or may include community-wide damage and emergency response).

4.2.2 Project-level Cumulative Setting (Near-term)

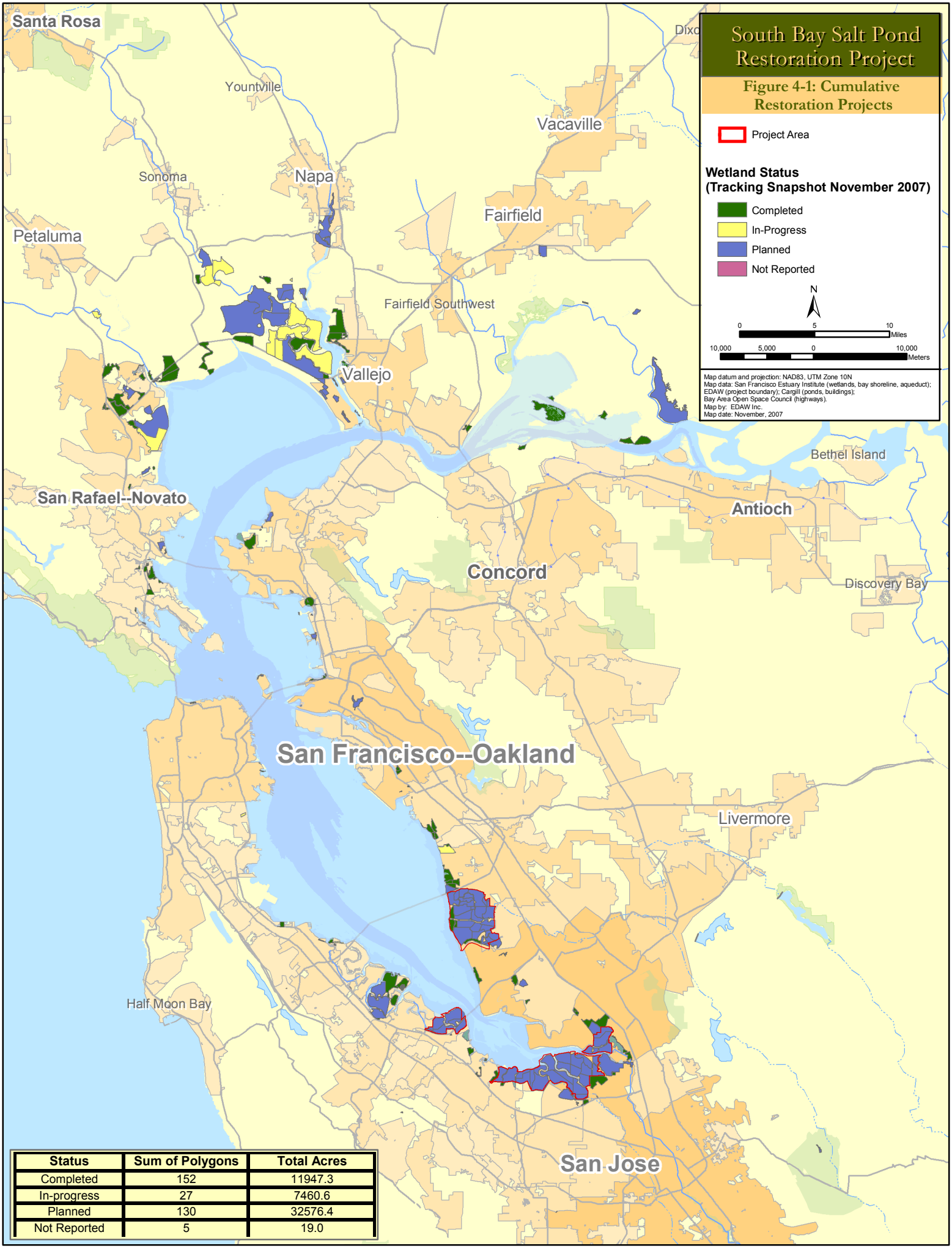
The project-level cumulative setting presented below discusses cumulative projects that will be implemented in the near term, including:

- Related projects described in Chapter 1, Introduction, including the Shoreline Study, the ISP, the Invasive Spartina Project, the ELER Restoration Project, the Alviso Slough Restoration Project, and the Lower Guadalupe River Flood Protection Project;
- Wetland restoration projects (see Table 4-5)
- Flood protection projects (see Table 4-6);
- PG&E Pond A6 Tower and Boardwalk Modification Project;
- Dumbarton Rail Corridor Project;
- Bay Division Pipeline Reliability Upgrade Project;
- Santa Clara Valley Habitat Conservation Plan/Natural Community Conservation Plan (HCP/NCCP);
- PG&E Habitat Conservation Plan (HCP);
- Union City Bay Trail;
- Boat Launch Facility at Alviso Marina County Park;
- Removal of Ravenswood Fishing Pier at the west end of the Dumbarton Bridge;
- San Francisco Bay Area Regional Rail Plan; and
- Residential, commercial and industrial projects identified in general plans, CIPs and project lists of South Bay cities and counties (see Table 4-7).

These projects are directly related to the project-level impact evaluation because they would occur within the same timeframe as the Phase 1 actions. However, they are also considered in the program-level (long-term) cumulative impact analysis.

Wetland Restoration Projects

Other wetland restoration projects in the San Francisco Bay Area could result in impacts and benefits similar to those of the SBSP Restoration Project. Figure 4-1 shows the locations of recently completed and planned wetland restoration projects in the San Francisco Bay Area. Because the loss and restoration of wetlands is a regional concern, and the SBSP Restoration Project is of regional significance, the



Status	Sum of Polygons	Total Acres
Completed	152	11947.3
In-progress	27	7460.6
Planned	130	32576.4
Not Reported	5	19.0

Table 4-5 Planned and Completed Tidal Wetland Projects

PROJECT	COUNTY	APPROXIMATE ACREAGE	STATUS
12th Street Reconstruction Project	Unknown	1	Planned
Albany Bulb Lagoon	Alameda	7	Planned
Albany Salt Marsh Expansion	Alameda	4	Planned
American Canyon Ecosystem Enhancement Project	Napa	635	Completed
Bahia Lagoon	Marin	30	Completed
Bair Island Restoration Project	San Mateo	1,387	3 Planned Sites
Bair Island SFO Mitigation	San Mateo	219	11 Completed Sites
Bayside Business Park - December 2002	Alameda	2	In-progress
Bayside Business Park - Phase I	Alameda	271	3 Completed Sites
Bayside Business Park - Phase II	Alameda	88	Completed
Bel Marin Keys Unit V	Marin	1566	Planned
Belden's Landing	Unknown	15	Completed
Blacklock Ranch	Solano	65	Planned
Bothin Marsh	Marin	0.5	Completed
Breuners Mitigation Bank	Contra Costa	109	Planned
Brisbane Baylands	San Mateo	32	In-progress
Burlingame Lagoon	San Mateo	50	Completed
CalTrans Mitigation Site	Unknown	22	Completed
Cargill Mitigation Marsh	Alameda	49	Completed
Castro Cove	Contra Costa	5	In-progress
Central Avenue Marsh	Contra Costa	189	Completed
Cerrito Creek at Albany Hills	Alameda	1	Completed
Charleston Slough Tidal Marsh Restoration Project	Santa Clara	101	Completed
Chipps Island East	Unknown	270	Completed
Chipps Island West	Unknown	148	Completed
Citation Marsh	Alameda	95	Completed
Codornices Creek Restoration – Nagai Property	Alameda	0.03	Planned
Cogswell Marsh	Alameda	229	Completed
Colma Creek Mitigation	San Francisco	2	Completed
Color Spot	Contra Costa	1	Completed
Cooley Landing	San Mateo	119	Completed
Corte Madera Ecological Reserve Expansion	Marin	8	Completed

Table 4-5 Planned and Completed Tidal Wetland Projects (continued)

PROJECT	COUNTY	APPROXIMATE ACREAGE	STATUS
Coyote Creek Flood Control Project	Santa Clara	67	2 Planned Sites
Crissy Field	San Francisco	14	Completed
Cullinan Ranch	Solano, Napa	1565	Planned
Deak Marsh	Marin	1	Completed
Dunphy Park	Marin	1	Completed
East Shore Park - Berkeley Meadows	Alameda	55	Planned
East Shore Park - Schoolhouse Creek	Alameda	2	Planned
East Shore Park - Strawberry Creek	Alameda	2	Planned
Eden Ecological Preserve Restoration Project	Alameda	768	4 Planned Sites
Edgerley Island Marina	Napa	9	Completed
Emeryville Crescent	Alameda	50	Completed
Emily Renzel Marsh	Santa Clara	36	2 Completed Sites
Faber Tract Marsh	San Mateo	87	Completed
Foster City Mitigation Sites	San Mateo	32	3 In-progress Sites
Gallinas Creek Restoration Project (Phase1, 2, and 3)	Marin	19	Completed
Green Point/Toy Marsh	Marin	57	Completed
Guadalcanal Village Restoration Project	Solano	56	Completed
Hamilton Airfield	Marin	871	In-progress
Harvey Marsh	Santa Clara	52	Completed
Hayward Marsh Brackish	Alameda	59	Completed
Hayward Shoreline Enhancement Project	Alameda	80	Completed
Hayward Shoreline Enhancement Project-Oliver Salt Ponds	Alameda	134	Planned
Hill Slough West Restoration Project	Alameda	223	Planned
Hoffman Marsh Wetland Mitigation Project	Contra Costa	6	Completed
Ideal Marsh	Alameda	129	Completed
KGO Towers	Alameda	1	Completed
Knapp Tract	Alameda	382	Planned
La Riviere Marsh	Alameda	118	Completed
Lake Merritt Restoration	Alameda	153	Planned
Leonard Ranch Wetlands Restoration Project	Unknown	536	2 Completed Sites
Los Osos Creek Riparian Habitat Restoration	Unknown	1	Not Reported
Madera Bay Park	Marin	5	Completed
Madera del Presidio Project (Phase I and II)	Unknown	111	Completed
Mare Island Navy Conservation Areas	Solano	106	4 Planned Sites
Mare Island Navy Mitigation Marsh	Solano	63	2 Planned Sites

Table 4-5 Planned and Completed Tidal Wetland Projects (continued)

PROJECT	COUNTY	APPROXIMATE ACREAGE	STATUS
Mare Island Refuge	Solano	168	3 Planned Sites
Mayhew's Landing	Alameda	110	Planned
Mill Valley Marsh	Marin	6	Completed
Miller Creek	Marin	12	Completed
Martin Luther King, Jr. Regional Shoreline Wetlands Project	Alameda	71	2 Completed Sites
Montezuma Wetlands Project	Solano	2288	Planned
Moseley Tract	San Mateo	61	Planned
Mountain View Tidal Marsh	Santa Clara	29	Completed
Muzzi Marsh	Marin	148	2 Completed Sites
Napa River Flood Control	Napa	941	4 Planned Sites
Napa River Salt Marsh Restoration Project	Napa	7,329	6 Planned Sites; 6 In-progress Sites; 1 Completed Site
Napa River Salt Marsh Restoration Project - Camp 2 Wingo Unit Marsh Restoration	Napa	588	In-progress
Napa River Salt Marsh Restoration Project - Huichica Creek Unit	Napa	15	In-progress
Napa River Salt Marsh Restoration Project - Ringstorm Bay Unit Marsh Restoration	Napa	625	In-progress
Nevada Parcel	Contra Costa	109	Completed
New Chicago Marsh	Santa Clara	387	Completed
North Basin Wetlands	Alameda	5	Completed
North Bothin Marsh Enhancement Project	Marin	0.4	Completed
Northern Outer Bair Island	San Mateo	552	6 Completed Sites
Novato Creek Antenna Field	Marin	134	Planned
Oakland Middle Harbor Enhancement Project	Alameda	5	Planned
Oro Loma Marsh Enhancement Project	Alameda	315	In-progress
Oro Loma Marsh Mitigation Project	Alameda	22	Completed
Pacific Shores Center	San Mateo	146	Completed
Palo Alto Harbor Improvements	Santa Clara	15	2 Completed Sites
Perry Gun Club Mitigation Project	Alameda	17	Planned
Petaluma Marsh Expansion Project	Marin, Sonoma	108	In-progress
Petaluma River Marsh	Sonoma	46	Completed
Pier 94	San Francisco	8	In-progress
Pier 98	San Francisco	9	Completed
Plummer Creek Wetlands Restoration Mitigation Project	Alameda	26	Completed
Point Buckler	Unknown	50	Completed

Table 4-5 Planned and Completed Tidal Wetland Projects (continued)

PROJECT	COUNTY	APPROXIMATE ACREAGE	STATUS
Polhemus Creek Restoration Project	San Mateo	1	Planned
Pond 3	Alameda	110	Completed
Pond A18	Santa Clara	856	Planned
Pond A4	Santa Clara	307	Planned
Port Sonoma Marina Perimeter	Sonoma	9	2 Completed Sites
Richardson Bay Bridge Marshes	Marin	6	2 Completed Sites
Richmond Parkway	Contra Costa	2	Completed
River Park	Solano	39	Planned
Ryer Island	Unknown	930	Completed
San Carlos Airport North Clear Zone	San Mateo	0.4	Completed
San Leandro Shoreline Marshlands Enhancement Project	Alameda	172	3 Completed Sites
San Mateo's Master Shoreline Parks Masterplan	San Mateo	12.3	3 Planned Sites
Sanchez Creek Marsh	San Mateo	3	Completed
Schellville	Sonoma	387	Planned
Seabreeze Marina	Alameda	0.3	3 In-progress Sites
Seal Slough	San Mateo	47	Completed
SFO North Bay Project Area	Sonoma	4,170	2 Planned Sites
Slaughterhouse Point	Sonoma	276	Completed
Sonoma Baylands Salt Marsh Restoration	Sonoma	350	Completed
South Basin Wetlands	Alameda	4	Completed
Stevens Creek Tidal Marsh	Santa Clara	31	Completed
Sunnyvale Baylands Park	Santa Clara	12	3 Completed Sites
Tasman Corridor Light Rail Transit Mitigation Project	Santa Clara	4	In-progress
The Froom Ranch/Home Depot Site Mitigation Project	Unknown	19	Completed
Tolay Creek	Sonoma	306	Completed
Treasure Island	San Francisco	17	2 Planned Sites
Triangle Marsh at Hayward Shoreline	Alameda	9	Completed
Triangle Marsh at Larkspur	Marin	6	In-progress
Triangle Marsh Restoration Project	Unknown	16	Completed
Triangle Marsh, Refuge Entry	Alameda	9	In-progress
Tubbs Island Marsh Restoration Project	Sonoma	68	Completed
Turri Road, Los Osos Creek Remediation Project	Unknown	0.3	Completed
U.S. Maritime Administration Marsh	Unknown	70	Completed
Vallejo Mitigation Sites	Solano	136	5 Completed Sites

Table 4-5 Planned and Completed Tidal Wetland Projects (continued)

PROJECT	COUNTY	APPROXIMATE ACREAGE	STATUS
Walters Creek Riparian Restoration Project	Unknown	0.3	Completed
Webb Ranch Mitigation Site for the Rosewood Sand Hill Hotel and Office Development Project	Unknown	4	Planned
West Navy Marsh	Unknown	64	Completed
Western Stege Marsh Restoration	Contra Costa	9	In-progress
Whales Tail	Alameda	255	2 Completed Sites
Wheeler Island	Unknown	98	Completed
Whipple Ave Mitigation	San Mateo	8	Completed
White Slough	Solano	94	Completed
Wildcat Creek Marsh Restoration Project	Unknown	280	Completed

Note: Information presented in this table was obtained from SFEI using data collected in 2005. Recent updates to certain wetland projects may not be reflected in this table.
Source: SFEI Wetland Tracker 2005; Mid-Peninsula Regional Open Space District (accessed on January 24, 2007)

inclusion of other wetland restoration projects in the San Francisco Bay Area in this cumulative impact evaluation is appropriate. San Francisco Bay, from generally Sonoma County in the north to Santa Clara County in the south, constitutes the geographic context by which potential cumulative impacts are evaluated. A list of the tidal wetland restoration projects in the San Francisco Bay Area considered in this evaluation is shown in Table 4-5. It should be noted that where wetland restoration projects have both tidal and non-tidal components, they are included in the table. Figure 4-1 identifies these tidal wetland restoration projects relative to the SBSP Restoration Project; they generally occur along the San Francisco Bay shoreline. Figure 4-1 also identifies other non-tidal wetland restoration projects that were not considered in this cumulative impact analysis.

A description of each tidal restoration project listed in Table 4-5 is not provided in this EIS/R. However, it can be generally stated that these projects include both tidal restoration and enhancement, and the projects are intended to restore or enhance hydrology, water quality, and ecological functions. Therefore, the goals of these projects are similar to the SBSP Restoration Project Objectives.

Flood Protection Projects

Planned flood protection projects in the San Francisco Bay Area could result in impacts and benefits similar to those of the SBSP Restoration Project, which includes flood protection facilities and improvements. Table 4-6 presents a list of planned flood protection projects in the South Bay that are considered in the cumulative impact analysis. These projects, which include improvements to existing flood protection facilities as well as construction of new facilities, were identified by Santa Clara Valley Water District (SCVWD), Alameda County Flood Control and Water Conservation District (ACFCWCD), and San Mateo County Flood Control District.

Table 4-6 Planned Flood Protection Projects in or Near the SBSP Restoration Project Area

CREEK/LOCATION	COUNTY	PLANNED PROJECTS	STATUS
Alameda County Flood Control Channel	Alameda	Alameda County Flood Control Channel Levee Reconfiguration; possible breaching into the salt ponds to the north	Alternatives development/ preliminary design
Laguna Creek	Alameda	Feasibility Study for Laguna Creek Overflow into Ponds A22 and A23; Feasibility Study for new flood control levees landward of Ponds A22 and A23	Alternatives development/ preliminary design
Old Alameda Creek	Alameda	Levee reconfiguration and possible breaching to salt ponds to the north and south	Alternatives development/ preliminary design
Eden Landing Ecological Reserve	Alameda	Levee construction in coordination with Bay Trail Extension	In construction; scheduled for completion in 2008
Permanente Creek	Santa Clara	San Francisco Bay to El Camino Real Planning Study	Scheduled for completion in 2008
Sunnyvale West Channel	Santa Clara	Guadalupe Slough to Maude Ave. Planning Study	Scheduled for completion in 2010
Sunnyvale East Channel	Santa Clara	Guadalupe Slough to I-280 Planning Study	Scheduled for completion in 2010
Guadalupe River	Santa Clara	Alviso Slough Restoration Project (Gold Street to County Marina) Planning Study	Scheduled for completion in 2009
San Francisquito Creek	Santa Clara/ San Mateo	San Francisquito Creek Feasibility Study	Alternatives development/ feasibility assessment
Redwood Creek/ Flood Slough	San Mateo	Redwood City Salt Ponds Project; planning to determine the fate of salt ponds and inclusion of flood control aspects in the conversion of the salt ponds	Alternatives development

Note: Planning is in process for flood protection projects to be located within the specified reaches. Alternatives development is currently underway, and planning is scheduled to be completed as shown in the STATUS column.

Dumbarton Rail Corridor Project

The Dumbarton Rail Corridor Project is proposed by Caltrain and the Federal Transit Administration, in cooperation with local agencies, to rehabilitate rail bridges and tracks that span the Bay between Redwood City and Newark, and improve existing tracks and signal controls from Newark, through Fremont to Union City. It would also involve the construction of three new passenger rail stations in Menlo Park/East Palo Alto, Newark, Union City, and a new layover facility in the East Bay, as well as upgrade of the Fremont Centerville Station.

The proposed Dumbarton train service would consist of six trains across the bridge during the morning commute and six during the evening commute hours. Morning trains would originate at the Union City

Intermodal Station, cross the Bay to Redwood City, and then three trains would travel north to San Francisco and three would travel south to San Jose. In the evening, all trains would reverse pattern and travel back to Union City.

Environmental studies are currently being conducted for the project and a Draft EIS/R is expected to be published in spring 2008. If the project is approved, rail service could begin in 2012.

Bay Division Pipeline Reliability Upgrade Project

The Bay Division Pipeline Reliability Upgrade Project seeks to build a fifth Bay Division Pipeline along the existing San Francisco Public Utilities Commission (SFPUC) right-of-way, and a tunnel underneath San Francisco Bay. This pipeline would allow the SFPUC to take other sections of pipelines, some of which were built in the 1920s and 1930s, out of service for repair and maintenance, and would provide a lifeline pipeline that is designed to withstand earthquakes.

This project consists of constructing a 21-mile Bay Division Pipeline No. 5 (BDPL No. 5) from Irvington Tunnel Portal in Fremont to Pulgas Tunnel Portal near Redwood City, including a tunnel under San Francisco Bay and adjacent marshlands near the Ravenswood pond complex. This pipeline would pass through the cities of Fremont, Newark, East Palo Alto, Menlo Park and Redwood City.

The SFPUC is currently conducting environmental review for the project. Construction is scheduled to begin in 2009 and finish in 2013.

Santa Clara Valley Habitat Conservation Plan/Natural Community Conservation Plan

Santa Clara County, SCVWD, the Valley Transportation Authority and the cities of San Jose, Morgan Hill and Gilroy, in consultation with USFWS, CDFG and NMFS, are developing a HCP/NCCP to facilitate obtaining incidental take permits from the wildlife agencies, per the requirements of the federal Endangered Species Act and the California Natural Community Conservation Planning Act and to develop a long-term conservation plan to protect and contribute to the recovery of covered species and natural communities in Santa Clara County while allowing for appropriate development and maintenance activities that are compatible with other local policies and regulations. The HCP/NCCP covers 520,000 acres within Santa Clara County that generally coincide with the Coyote Creek and Pajaro River watersheds as well as a significant portion of the Guadalupe River watershed.

The Santa Clara Valley HCP/NCCP will identify and preserve land that provides important habitat for endangered and threatened species. The land preservation is both to mitigate for the environmental impacts of planned development and public infrastructure O&M activities and to enhance the long-term viability of endangered species.

Completion of the Final HCP/NCCP and certification of the environmental review is expected in 2009.

PG&E Habitat Conservation Plan

PG&E is currently in the process of developing a HCP that would provide a framework for permitting routine operation and maintenance activies as well as minor new construction for the nine Bay Area counties over the next 30 years. Objectives of the HCP are to: identify avoidance and minimization measures (AMM) that would reduce potential effects on wildlife and plant species; identify a range of approaches to compensate for 'take' of species; and provide an institutional structure for training on AMM and coordination of compensation across the San Francisco Bay Area. PG&E has received input from USFWS and CDFG during the development of the HCP.

PG&E Pond A6 Tower and Boardwalk Modification Project

PG&E has three 115 kilovolt (kV) transmission lines spanning a distance of approximately 4,500 feet (ft) in Pond A6 in the Alviso pond complex. In response to potential natural (unplanned) breaching of the levees around Pond A6 and in preparation for the potential planned breaches of these levees in Phase 1 of the SBSP Restoration Project, PG&E replaced the eleven existing transmission towers with nine new towers and reconductored two of the three transmission lines. In addition, PG&E has previously replaced its boardwalk that it uses to service the transmission towers and lines in Pond A6. Construction of additional boardwalks or docks necessary for PG&E access to the towers and lines is discussed in Section 2.5.3 in Chapter 2.

PG&E Operations and Maintenance Activities

For ponds in Phase 1, PG&E would conduct O&M activities as described in Section 4.2.1, above, and Section 2.5.3.

Union City Bay Trail

The City of Union City and East Bay Regional Park District (EBRPD) are planning to extend the Bay Trail along the eastern boundary of the 835-acre ELER Restoration Project Area. Construction is scheduled to begin in 2007.

Boat Launch Facility at Alviso Marina County Park

Santa Clara County plans to construct a boat launch facility at Alviso Marina County Park. This facility is a component of Phase II of the Alviso Marina County Park Master Plan. Phase II, which is primarily funded by the California Department of Boating and Waterways, will consist of expansion of shoreline access improvements, benches, landscaping, a new and larger boat launch ramp for access to Alviso Slough and San Francisco Bay, an access road, and parking for boat trailers.

Design and environmental review of the facility are currently underway. The design work, contract documents and permit issuance by the various regulatory agencies is expected to take approximately twelve months, the actual construction work is expected to start in the fall of 2007, and the completion of the improvement project is anticipated for summer 2008.

Ravenswood Fishing Pier Removal Project

Caltrans is expected to remove the closed Ravenswood Fishing Pier as one of the BCDC permit conditions for construction of the Dumbarton Bridge. The removal project is not currently scheduled.

San Francisco Bay Regional Rail Plan

The Metropolitan Transportation Commission, the Peninsula Corridor Joint Powers Board (Caltrain), the Bay Area Rapid Transit District (BART), and the California High-Speed Rail Authority (CHSRA) collaborated in the preparation of the Bay Area Regional Rail Plan. The purposes of the Plan include identifying a vision for an interconnected system of Bay Area passenger rail improvements and expansions and creation of a safe, fast, reliable, and integrated passenger and freight rail network that addresses anticipated growth in transportation demand.

The Plan examines ways for the Bay Area to incorporate passenger trains into existing rail systems, improve connections to other trains and transit, expand the regional rapid transit and railroad-based rail network, increase rail capacity, and coordinate rail investment around transit friendly communities and businesses. One component of the Plan is to multi-track the Coast Subdivision Newark and Alviso segment on trestle in the 2030-2050 time frame.

City and County Development Projects

As noted above, local, regional and state agencies identify projects in their planning documents, CIPs, and development project lists. These projects are generally planned to be implemented in the near term (within approximately five to 10 years). Project development lists and CIPs within jurisdictions near the Phase 1 actions were reviewed to obtain information on planned, completed and reasonably foreseeable projects.

Given the scale of the Project and the geographic extent of the area considered in the cumulative impact evaluation, an exceedingly large number of projects were identified. It is not reasonable to list all of these projects in the EIS/R. Table 4-7 generally characterizes the types of near-term projects identified on project lists and CIPs of local jurisdictions where the Phase 1 actions occur, including the cities of Hayward, San Jose, Mountain View, Sunnyvale, and Menlo Park. The categories of projects shown below are not meant to be exhaustive, but generally capture the types of activities that would require physical changes to the environment which could in turn result in environmental impacts. These projects range from residential development to street improvements. Examples of projects proposed by local jurisdictions for each category are presented in the table. These cumulative projects are scattered throughout the South Bay and are primarily within urban areas. The cumulative projects may be in various stages of planning (*e.g.*, undergoing review by planning departments, preparing environmental documentation) while others are either under construction or recently completed. These cumulative projects vary in size and extent; some projects may be site-specific (*i.e.*, improvements to a commercial property at a specific location), while others may extend over several miles (*e.g.*, installation of pipelines).

Information concerning these projects is included in the SBSP Restoration Project EIS/R administrative record.

Table 4-7 Other Cumulative Projects – by Types

CATEGORIES OF PROJECTS	DESCRIPTION
Residential	Projects include construction of accessory structures to private homes, residential developments (single- and multiple-family homes), subdivisions, and rezoning.
Commercial	Projects include conversion or construction of retail stores, restaurants, offices, parking structures, and gas stations.
Industrial	Projects include conversion or construction of industrial development (*e.g.*, self-storage facilities, R&D buildings), subdivisions.
Mixed-use	Projects include mixed-use development consisting of housing units and commercial space.
Recreation	Projects include construction/improvement of creek trails, bicycle/pedestrian corridors and bridges, pools, park facilities, ADA improvements, and park landscape improvements.
Street/Traffic	Projects include road widening, intersection improvements, sidewalk/curb construction/repairs, streetscape improvements, traffic signal replacement/modification, bridge repairs, and railroad-related improvements.
Utilities	Projects include the replacement of water/sewer/stormdrain pipes and appurtenances, construction/replacement of solid waste facilities, construction of telecommunications facilities.
Public facilities	Projects include construction/renovation of fire stations, community centers, medical facilities, children's centers, transit centers, and libraries.
Places of Assembly	Projects include construction of churches and temples.

North San Jose Development Policies Project

A Task Force consisting of North San Jose residents, business owners and property owners is assisting the City in planning for the development of new neighborhoods and neighborhood services as part of the implementation of the City's North San Jose Area Development Policy (Policy) (San Jose 2007). The updated Policy, which will guide the ongoing growth and development of the North San Jose area, covers the North San Jose area north and west of I-880 and south of SR 237. The goals of this long-range planning effort includes allowing up to an additional 27 million square ft of research and development and office space in North San Jose, and creating new high-density residential development (up to 32,000 units).

The City Council approved an update to the Policy on June 21, 2005. In December 2006, a settlement over challenges to the Policy was approved by the Santa Clara County Court Superior Court. Applications to implement the adopted Policy for residential and commercial uses have already been submitted to the City.

Patterson Ranch

The Frisbie Planning Company proposes to develop the 428-acre Patterson Ranch property in Fremont. The property is bounded on the north by the Alameda Creek Flood Control Channel (ACFCC), Coyote Hills Regional Park on the west, the Southern Pacific Railroad to the east, and Paseo Padre Parkingway to the south. The Patterson Ranch Development and Environmental Preservation & Enhancement Plan was prepared in September 2006. The components of the plan include: gifting of approximately 250 acres of land to the EBRPD, dedication of approximately 40 acres of land to the City of Fremont, preservation of biological and cultural resources, installation of trails, and construction of 800 residential units, parks, a school, church, and retail uses (Frisbie Planning Company et. al. 2006). The development has been identified in the City of Fremont's development activity list as incomplete.

Peninsula Park Project

Glenborough Pauls proposes to redevelop the existing 33-acre impound car storage in Redwood City. The development, named Peninsula Park, would consist of a community park, 200-room hotel, 10,000 square ft of convenience retail, approximately 800 townhomes and condominiums, and 5 acres of marinas and canals. The development encompasses a portion of the area formerly proposed as Marina Shores Village, which is located generally east of US 101, south of Bair Island Road.

Cisco Field & Ballpark Village Project

The Oakland Athletics Baseball Company proposes the Cisco Field & Ballpark Village Project. The Ballpark Village is located within the City of Fremont in Alameda County; it is adjacent to and west of Interstate 880 and south of Auto Mall Parkway (The Athletics Baseball Company 2007). Two alternatives for build-out are proposed. At build-out, the Plan's land use program would include: a 32,000-seat ballpark with ancillary outfield buildings for ballpark related uses, office uses and a few dwelling units; retail; an 80-room boutique hotel; up to 3,150 residential units and 10,500 ballpark parking spaces. The alternative would provide for additional Auto Mall and R&D/Office uses. Surface parking would be provided during the interim phase.

City of Newark Areas 3 and 4 Specific Plan

The Area 3 and 4 Specific Plan is located southwest of Cherry Street between Mowry Avenue and Stevenson Boulevard (Grindall 2007). Two conceptual plans have been introduced to-date. The plans identify an 18-hole championship golf course, residences (between 1,000 to 1,400 units), a community center, school, and park. Phase 1 (Constraints Analysis) of the project initiated in Fall 2007; development of alternatives and the Conceptual Plan is expected in Spring 2008.

4.3 Cumulative Impacts and Mitigation Measures

Overview

The types of projects that are evaluated in the cumulative context are those which would result in similar environmental effects. Wetland restoration projects typically result in similar benefits and impacts, and

such effects are evaluated in the regional context. For other cumulative projects (*e.g.*, infrastructure, development) that are represented by the ABAG projections or associated with other regional plans, only the construction components are expected to result in similar effects, because all construction projects would require earthmoving activities that could result in potential impacts to the environment by increasing dust, traffic, and noise, and possibly affecting sensitive habitats and special-status plant and wildlife species. It is assumed that the SBSP Restoration Project would be implemented concurrently with other cumulative projects, thus contributing to local and regional cumulative impacts. A distinction is made between local and regional impacts because the geographic context for cumulative impacts differs among the issue areas. For example, the SFBAAB is the regional context for air quality; whereas for noise, only the local environment is considered for cumulative impacts. All of the impacts associated with tidal wetland restoration and enhancement are considered in the regional context due to the importance of wetlands in the region both historically and presently.

Similar to the SBSP Restoration Project impacts discussed in Chapter 3, Environmental Setting, Impacts and Mitigation Measures, the cumulative impacts are presented at two levels of analysis:

- The program-level cumulative impact evaluation considers impacts of SBSP long-term Alternatives A, B and C as well as other cumulative projects which would be implemented over the 50-year planning period.
- The project-level cumulative impact analysis considers impacts which would result from implementation of the Phase 1 actions (the first phase of Alternatives B and C) together with impacts of other cumulative projects which would occur in the near term.

While both the program- and project-level cumulative analyses address potential impacts that would occur over the 50-year planning period, the program-level evaluation focuses on long-term impacts that consider the long-term projections and development trends identified in regional plans, while the project-level (Phase 1) discussion focuses on impacts that would occur in the short term that would result from the Project plus the other cumulative projects identified in Section 4.2.2 that would be implemented in the short term. The program-level cumulative impact analysis considers the specific cumulative projects included in the project-level cumulative setting.

The cumulative impacts are presented in the same format as the Project impacts in Chapter 3, Environmental Setting, Impacts and Mitigation Measures. For each cumulative impact, first a discussion of program-level alternatives (A, B and C) is presented, followed by a discussion of the project-level Phase 1 No Action (project-level Alternative A) and the Phase 1 actions (the first phase of Alternatives B and C). The cumulative impact numbering system corresponds to the numbering system used in Chapter 3 for the Project impacts. For each cumulative impact, the impacts of the cumulative projects are generally characterized and the SBSP Restoration Project's contribution to the cumulative impact is also described. The level of significance for each overall cumulative impact (the effects of the cumulative projects plus the SBSP Restoration Project) is presented in bold text following the discussion.

The significance determinations presented below in bold text reflect the severity of the *cumulative* impacts (the SBSP Restoration Project's effects plus the effects of other past, present and reasonably foreseeable projects), *not* the SBSP Restoration Project's contribution to the cumulative impacts. The

Project's contributions to cumulative impacts are presented in the impact discussions. For many of the cumulative impacts, the SBSP Restoration Project's contribution is less than considerable, but the cumulative impact is potentially significant due to the combined effects of this Project together with other projects. For some of the cumulative impacts, the Project's contribution to cumulative effects (*e.g.*, related to flooding and biological resources) would be beneficial. In these cases, the cumulative impacts would also be beneficial due to the Project's size and extent.

According to CEQA Guidelines Section 15130 (b)(5), "[a]n EIR shall examine reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects." The Project includes an Adaptive Management Plan, which also ensures that the Project would avoid contributing to significant cumulative effects. The Adaptive Management Plan, presented in Appendix D and summarized in Section 2.3 of Chapter 2, Description of Alternatives, identifies management actions that are intended to optimize environmental resources affected by the Project as well as avoid or reduce impacts to acceptable, less-than-significant levels. Management actions address specific environmental issues, including sediment dynamics, water quality, biological resources, and recreation and public access. These actions would ensure that the Project's contribution to cumulative impacts would be less than considerable, such that additional mitigation would not be needed.

For environmental issues not covered by the Adaptive Management Plan, in most cases the Project would either not contribute to considerable cumulative impacts or the Project's contribution would be reduced to less than considerable with proposed mitigation measures. However, in some cases, potentially significant (and unavoidable) impacts may result and no reasonable, feasible options would be available to avoid or reduce the Project's contribution to significant cumulative effects. As indicated in CEQA Guidelines Section 15130(c), "with some projects, the only feasible mitigation for cumulative impacts may involve the adoption of ordinances or regulations rather than the imposition of conditions on a project-by-project basis." For example, a region-wide mitigation program for ruddy ducks may be needed to address the cumulatively significant unavoidable effect on this species from the Project combined with other cumulative projects. To the extent feasible, the Project has examined all reasonable, feasible options for mitigating or avoiding the project's contribution to any significant cumulative effects.

Hydrology, Flood Management, and Infrastructure

Cumulative Impact 3.3-1: **Potential for increased coastal flood risk landward of the SBSP Restoration Project Area.**

Alternative A. Flood management and wetland restoration projects are expected to influence coastal flood risks landward of the SBSP Restoration Project Area, whereas other cumulative projects are not expected to influence coastal flood risks. Flood management and wetland restoration projects, particularly the Shoreline Study, are intended to maintain or improve levels of coastal flood protection landward of the SBSP Restoration Project Area. Implementation of Shoreline Study potential actions (still in early planning) and other flood management projects would likely decrease the risk of coastal flooding and provide flooding benefits throughout the Project Area. Consequently, the impacts on coastal flood risks resulting from other cumulative projects would be less than significant/beneficial. However, temporary (and perhaps permanent) increases in the coastal flood risks would likely exist throughout the 50-year

planning horizon due to uncertainties with respect to the type and geographic extent of potential Shoreline Study actions, the eventual phasing of the Shoreline Study implementation.

Sea level rise is the increased frequency and severity of coastal flood events. For example, sea level rise increases flood water levels and the height of storm waves enabling them to extend further inland. Therefore, the increase on coastal flood risks due to accelerated sea level rise would be potentially significant. Alternative A alone is also expected to result in a potentially significant impact to coastal flooding (as discussed for SBSP Impact 3.3-1). Therefore, the cumulative impact of other flood protection and wetland restoration projects, sea level rise and Alternative A would be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As described under Alternative A, above, other cumulative projects would result in a less than significant/beneficial impact related to coastal flood risk in the absence of the SBSP Restoration Project. Alternative B would address rising sea levels and maintain or improve flood protection landward of the SBSP Restoration Project Area. Therefore its contribution to cumulative impacts associated with decreasing coastal flood risk would be less than significant/beneficial (see SBSP Impact 3.3-1 in Section 3.3). Implementation of Alternative B would offset the potentially significant impacts associated with sea level rise landward of the SBSP Restoration Project Area. The cumulative impacts associated with the combination of Alternative B, sea level rise and other cumulative wetlands and flood management projects would be less than significant/beneficial.

Alternative B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative C. The cumulative impacts associated with Alternative C, sea level rise and other wetland restoration and flood management projects would be the same as described for Alternative B.

Alternative C Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Phase 1 No Action at Eden Landing. As described under Alternative A, above, other cumulative projects would result in a less than significant/beneficial impact related to coastal flood risk. The increase in coastal flood risks due to accelerated sea level rise would be potentially significant. Under Phase 1 No Action, coastal flood hazards are expected to increase in the short term, and decrease in the long term as discussed for the Phase 1 No Action (see Phase 1 Impact 3.3-1). The contribution of Phase 1 No Action to cumulative impacts would be potentially significant. The cumulative impacts of the Phase 1 No Action, sea level rise and other cumulative projects would therefore contribute to an increased risk of coastal flooding, resulting in potentially significant impacts.

Eden Landing Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 No Action at Alviso. As described under Alternative A, above, other cumulative projects would result in a less than significant/beneficial impact related to coastal flood risk. The increase on coastal flood risks due to accelerated sea level rise would be potentially significant. Phase 1 No Action is not

expected to increase coastal flood hazards (see Phase 1 Impact 3.3-1), and as such its contribution to cumulative impacts would be less than significant. The cumulative impacts of other cumulative projects, sea level rise and the Phase 1 No Action would be potentially significant.

Alviso Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 No Action at Ravenswood. As described under Alternative A, above, other cumulative projects would result in a less than significant/beneficial impact related to coastal flood risk. The increase on coastal flood risks due to accelerated sea level rise would be potentially significant. The Phase 1 No Action is not expected to increase coastal flood hazards (see Phase 1 Impact 3.3-1), and as such its contribution to cumulative impacts would be less than significant. The cumulative impacts of other cumulative projects, sea level rise and the Phase 1 No Action would be potentially significant.

Ravenswood Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 Actions. As described under Alternative A, above, other cumulative projects would result in a less than significant/beneficial impact related to coastal flood risk. The increase in coastal flood risks due to accelerated sea level rise would be potentially significant.

The Phase 1 actions would result in less than significant changes to water levels in the ponds or surrounding areas, and are not expected to impact coastal flooding (see Phase 1 Impact 3.3-1). The Phase 1 actions would not contribute to an increased risk of coastal flooding, and their contribution would be less than significant. The cumulative impacts associated with the Phase 1 actions, sea level rise and other cumulative projects would be potentially significant.

Phase 1 Actions Level of Significance: Potentially Significant

---

Cumulative Impact 3.3-2: **Increased coastal flood risk due to regional changes in Bay bathymetry and hydrodynamics.**

Alternative A. Tidal wetland restoration projects are expected to influence regional changes in Bay bathymetry and hydrodynamics, whereas other cumulative projects are not expected to influence Bay bathymetry and hydrodynamics. 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. The sediment demand associated with the other cumulative tidal wetland restoration projects in San Francisco Bay, and the South Bay in particular, would potentially increase coastal flood risks due to regional changes in Bay bathymetry and hydrodynamics.

Flood protection measures implemented with the Shoreline Study would improve levels of coastal flood protection over the long term; however, significant uncertainties exist with respect to the type and geographic extent of potential Shoreline Study actions, and the eventual phasing of the Shoreline Study implementation. Throughout the 50-year planning horizon, temporary (and perhaps permanent) increases in coastal flood risks associated with changes in Bay bathymetry and hydrodynamics are likely to exist.

Therefore, the impacts on coastal flood risks resulting from other cumulative projects would be potentially significant.

Sea level rise increases the frequency and severity of coastal flood events, increases shoreline erosion, and increases the inundation frequency of tidal wetlands, intertidal mudflats, and low-lying lands. As discussed in SBSP Impact 3.3-2 in Section 3.3, sea level rise would cause additional regional changes in Bay bathymetry and hydrodynamics and result in an increased coastal flood risk. Consequently, sea level rise would result in potentially significant impacts associated with increased coastal flood risks.

Approximately 4,500 acres would be restored to tidal action in an unplanned and uncontrolled manner under Alternative A, and therefore Alternative A's contribution to cumulative impacts associated with coastal flood risk would be potentially significant (see SBSP Impact 3.3-2 in Section 3.3). Throughout the 50-year planning horizon, implementation of Shoreline Study potential actions would likely offset some, but not necessarily all, of the flood impacts associated with Alternative A and other tidal wetland restoration projects, resulting in potentially significant increases in coastal flood hazards landward of the SBSP Restoration Project Area and outside of the SBSP Restoration Project Area. The cumulative impact of Alternative A, sea level rise and other tidal wetland restoration projects would therefore be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As described under Alternative A, above, the cumulative projects and sea level rise would result in potentially significant cumulative impacts.

Alternative B would restore approximately 7,500 acres to tidal action. As discussed under SBSP Impact 3.3-2, Alternative B would provide a continuous system of levees designed and managed to maintain or improve levels of coastal flood protection landward of the SBSP Restoration Project Area. Therefore, the regional changes to Bay bathymetry and hydrodynamics would not affect the coastal flood risk in areas protected by the SBSP Restoration Project shoreline levees. Outside the SBSP Restoration Project Area, more frequent levee maintenance would be required to reduce the risk of levee failure and coastal flooding. Although the SBSP Restoration Project would maintain or improve flood protection landward of the SBSP Restoration Project Area, cumulative impacts would remain potentially significant due to the risk of levee failure and coastal flooding outside the SBSP Restoration Project Area. Alternative B's contribution to cumulative impacts associated with coastal flood risk would be potentially significant (see SBSP Impact 3.3-2).

Outside of the SBSP Restoration Project Area, the cumulative impact associated with Alternative B, sea level rise and other cumulative projects would be potentially larger than that associated with Alternative A, and potentially significant.

Alternative B Level of Significance: Potentially Significant

Alternative C. The cumulative impacts associated with Alternative C, sea level rise and other tidal wetland restoration projects would be similar to those described for Alternative B. Alternative C would

restore approximately 13,500 acres to tidal action. Therefore, outside of the SBSP Restoration Project Area, the cumulative impact of Alternative C, sea level rise and other cumulative projects would be potentially larger than that associated with Alternative B and potentially significant.

Alternative C Level of Significance: Potentially Significant

Phase 1 No Action. As described under Alternative A, above, the cumulative projects and sea level rise would result in potentially significant cumulative impacts. Under Phase 1 No Action, approximately 1,220 acres would be restored to tidal action in an unplanned and uncontrolled manner, including 860 acres in the Eden Landing pond complex (Ponds E8A, E8X, E9, E12 and E13) and 360 acres in the Alviso pond complexes (Pond A6). As a result of these tidal conversions, approximately 1,010 additional acres would likely convert to tidal action, including 150 acres (Pond E14) associated with Pond E14 in the Eden Landing pond complex, and 860 acres (Ponds A5 and A7) in the Alviso pond complex. Combined with the 2,500 acres of other completed or planned wetland restoration projects in the South Bay, this would result in a cumulative combined total tidal restoration of over 4,730 acres. Although this was not explicitly analyzed in the South Bay Geomorphic Assessment (Appendix I) or the Hydrodynamic Modeling Report (Appendix J), this total is comparable to the restored acreage considered for Alternative A. The Phase 1 No Action's contribution to cumulative impacts associated with coastal flood risk would be potentially significant (see Phase 1 Impact 3.3-2 in Section 3.3). Therefore, cumulative impacts of the Phase 1 No Action and other cumulative projects would be significant in terms of coastal flood risk resulting from regional Bay bathymetry and hydrodynamics.

Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 Actions. As described under Alternative A, above, cumulative projects and sea level rise would result in potentially significant cumulative impacts. Implementation of the Phase 1 actions would result in approximately 990 acres of tidal restoration, including approximately 630 acres associated with Ponds E8A, E8X and E9 in the Eden Landing pond complex, and approximately 360 acres of tidal restoration associated with Pond A6 in the Alviso pond complex. The Phase 1 action's contribution to cumulative impacts associated with coastal flood risk would be a less than significant impact (see Phase 1 Impact 3.3-2). In combination with the 2,500 acres of other planned and proposed wetland restoration and flood protection projects in the South Bay, this would result in a cumulative total restoration of approximately 3,500 acres. The cumulative impacts associated with the Phase 1 actions would be similar to, but smaller than, those described for the Phase 1 No Action cumulative impact. Although cumulative impacts landward of the Phase 1 actions would be less than significant, the cumulative impact of the Phase 1 actions, sea level rise, and other projects would be potentially significant outside of the Phase 1 action projects areas.

Phase 1 Actions Level of Significance: Potentially Significant

---

Cumulative Impact 3.3-3: **Increased fluvial flood risk.**

Alternative A. Flood management and wetland restoration projects in the vicinity of the pond complexes are expected to affect fluvial flood risks, whereas other cumulative projects are expected to have minimal effects on fluvial flood risk. Several flood management projects are currently planned or proposed adjacent to the SBSP Restoration Project Area which would decrease fluvial flood risks, including levee improvements to the upstream reaches of the tributary sloughs, the potential Laguna Creek Overflow into Ponds A22 and A23 in the Alviso pond complex, and reconfiguration of the ACFCC and Old Alameda Creek (OAC) levees in the Eden Landing pond complex. Wetland restoration projects are expected to mitigate for any potential fluvial flood impacts. Therefore, the cumulative flood management and wetland restoration projects would have a beneficial impact on fluvial flooding within the SBSP Restoration Project Area.

Alternative A would result in an increase in fluvial flood water levels throughout the Project Area and as such its contribution to cumulative impacts associated with fluvial flood risk would be potentially significant (see SBSP Impact 3.3-3 in Section 3.3). Implementation of the Shoreline Study would decrease the risk of fluvial flooding associated with Alternative A, and likely would provide flood protection benefits throughout the Project Area. However, increases in fluvial flood risks would likely still exist throughout the 50-year planning horizon due to uncertainties with respect to the type and geographic extent of potential Shoreline Study potential actions, and the eventual phasing of the Shoreline Study implementation. Therefore, the cumulative impacts of other flood protection and wetland restoration projects and Alternative A would result in a potentially significant impact.

Alternative A Level of Significance: Potentially Significant

Alternative B. As described in Alternative A above, cumulative flood management and wetland restoration projects would have a beneficial impact on fluvial flooding within the SBSP Restoration Project Area.

Implementation of the tidal restoration along Alviso Slough under Alternative B would also improve the longer-term sustainability of the Alviso Slough Restoration Project, which would remove vegetation and increase the channel width of Alviso Slough in the short term. Alternative B's contribution to cumulative impacts associated with fluvial flood risk would be less than significant/beneficial (see SBSP Impact 3.3-3). Cumulative impacts resulting from Alternative B and other cumulative flood management and wetland restoration projects would be less than significant/beneficial.

Alternative B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative C. The cumulative impacts associated with Alternative C would be identical to those described for Alternative B.

Alternative C Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Phase 1 No Action at Eden Landing. As described in Alternative A above, cumulative flood management and wetland restoration projects would have a beneficial impact on fluvial flooding within the SBSP Restoration Project Area. Although other flood management and wetland restoration projects are planned or proposed in and adjacent to the Eden Landing pond complex that would improve fluvial flood protection, the unplanned tidal conversions associated with the Phase 1 No Action at Eden Landing present a potentially significant risk of increasing fluvial flood potential (see Phase 1 Impact 3.3-3). As such, the Phase 1 No Action contribution to cumulative impacts associated with fluvial flood risk at the Eden Landing pond complex would be potentially significant. Therefore, other cumulative flood management and wetland restoration projects and the Phase 1 No Action would increase the risk of fluvial flooding, and result in potentially significant cumulative impacts.

Eden Landing Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 No Action at Alviso. As described in Alternative A above, cumulative flood management and wetland restoration projects would have a beneficial impact on fluvial flooding within the SBSP Restoration Project Area. Although other flood management and wetland restoration projects are planned or proposed in and adjacent to the Alviso pond complex that would improve fluvial flood risks upstream of the SBSP Restoration Project Area, the Phase 1 No Action at Alviso would increase the risk of fluvial flooding in Guadalupe and Alviso Sloughs (see Phase 1 Impact 3.3-3). As such, the Phase 1 No Action contribution to cumulative impacts associated with fluvial flood risk at the Alviso pond complex would be potentially significant. Therefore, other cumulative flood management and wetland restoration projects and the Phase 1 No Action would increase the risk of fluvial flooding, and result in potentially significant cumulative impacts.

Alviso Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 No Action at Ravenswood. Cumulative flood management and wetland restoration projects would have a less than significant impact on fluvial flooding within the SBSP Restoration Project Area because no flood management or wetland restoration projects are currently planned or proposed adjacent to the Ravenswood pond complex that would increase fluvial flood risks. The Phase 1 No Action is not expected to increase fluvial flood risks (see Phase 1 Impact 3.3-3). As such, the Phase 1 No Action contribution to cumulative impacts associated with fluvial flood risk at the Ravenswood pond complex would be less than significant. Therefore, the cumulative impacts of other cumulative flood management and wetland restoration projects and the Phase 1 No Action would be less than significant.

Ravenswood Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. Cumulative flood management and wetland restoration projects would have a less than significant impact on fluvial flooding within the SBSP Restoration Project Area because no flood management or wetland restoration projects are currently planned or proposed adjacent to the Phase 1 actions that would increase fluvial flood risks. The Phase 1 actions are not expected to increase fluvial flood risks (see Phase 1 Impact 3.3-3). Therefore, the cumulative impacts of other cumulative flood management and wetland restoration projects and the Phase 1 actions would be less than significant.

Phase 1 Actions Level of Significance: Less than Significant

Cumulative Impact 3.3-4: **Increased levee erosion along channel banks downstream of tidal breaches.**

Alternative A. Tidal wetland restoration projects are expected to increase levee erosion along channel banks, whereas other cumulative projects are expected to have minimal effect on levee erosion along channel banks. Other planned or proposed wetland restoration projects, such as the Shoreline Study, would include tidal breaches; however, these projects would likely also include measures to protect against levee erosion along channel banks downstream of tidal breaches. Consequently, other cumulative projects would result in a less than significant impact. Alternative A alone, on the other hand, is expected to result in a potentially significant contribution to levee erosion along channel banks downstream of unplanned tidal breaches (see SBSP Impact 3.3-4 in Section 3.3). Implementation of other cumulative projects would likely offset some, but not necessarily all, of the negative impacts associated with Alternative A, resulting in potentially significant increases in erosion along channel banks. Therefore, the cumulative impacts of Alternative A and other cumulative tidal wetland restoration projects would be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As described under Alternative A, above, other cumulative tidal wetland restoration projects would result in a less than significant impact associated with levee erosion. Implementation of Alternative B, including the monitoring and maintenance described in Section 2.4.5 and the Adaptive Management Plan (see SBSP Impact 3.3-4 and Appendix D), would result in a less-than-significant impact associated with the erosion of levees required for flood protection. Therefore, the cumulative impacts of Alternative B and other cumulative tidal wetland restoration projects would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. The cumulative impacts associated with Alternative C would be identical to those described for Alternative B.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action at Eden Landing. As described under Alternative A, above, other cumulative tidal wetland restoration projects would result in a less than significant impact associated with levee erosion. However, the Phase 1 No Action would result in a potentially significant impact on levee erosion in Mt. Eden Creek and Old Alameda Creek downstream of unplanned tidal breaches (see Phase 1 Impact 3.3-4). Therefore, the cumulative impacts of the Phase 1 No Action and other cumulative tidal wetland restoration projects would be potentially significant.

Eden Landing Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 No Action at Alviso. As described under Alternative A, above, other cumulative tidal wetland restoration projects would result in a less than significant impact associated with levee erosion. The Phase 1 No Action would result in a potentially significant impact on levee erosion in Alviso and Guadalupe Sloughs downstream of unplanned tidal breaches (see Phase 1 Impact 3.3-4). Therefore, the cumulative impacts of the Phase 1 No Action and other cumulative tidal wetland restoration projects would be potentially significant.

Alviso Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 No Action at Ravenswood. As described under Alternative A, above, other cumulative tidal wetland restoration projects would result in a less than significant impact associated with levee erosion. The Phase 1 No Action would not be expected to increase levee erosion in the Ravenswood pond complex as there would be no tidal conversions (see Phase 1 Impact 3.3-4). As such, the Phase 1 No Action's contribution to cumulative impacts would be less than significant. Therefore, the cumulative impacts of the Phase 1 No Action and other cumulative tidal wetland restoration projects would be less than significant.

Ravenswood Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. As described under Alternative A, above, other cumulative tidal wetland restoration projects would result in a less than significant impact associated with levee erosion. Implementation of the Phase 1 actions, including the monitoring and maintenance described in Section 2.5.5 and the Adaptive Management Plan (see SBSP Impact 3.3-4 and Appendix D), would result in a less than significant impact associated with the erosion of levees required for flood protection (and less than significant contribution to cumulative impacts). Therefore, the cumulative impacts of the Phase 1 actions and other cumulative tidal wetland restoration projects would be less than significant.

Phase 1 Actions Level of Significance: Less than Significant

Cumulative Impact 3.3-5: **Potential interference with navigation.**

Alternative A. Flood management and wetland restoration projects are expected to affect navigation, whereas other cumulative projects are expected to have minimal effects on navigation. These cumulative projects, such as the Alviso Slough Restoration Project, would provide navigation benefits. Consequently, cumulative impacts associated with navigation from other cumulative projects would be less than significant/beneficial.

Alternative A would provide limited benefits to the navigation potential in Mt. Eden Creek, North Creek, OAC, and ACFCC in the Eden Landing pond complex, and in Alviso and Guadalupe Sloughs in the Alviso pond complex (see SBSP Impact 3.3-5 in Section 3.3). Alternative A's contribution to cumulative impacts associated with navigation would be less than significant/beneficial. However, USFWS and CDFG could restrict navigation according to season (*e.g.*, no access during breeding season), by type of

access (*e.g.*, non-motorized versus motorized), or type of use (*e.g.*, waterfowl hunting only). Unless explicitly allowed pursuant to a compatibility determination, navigation within the tidally-converted ponds would not be allowed. The compatibility determination process would be included during subsequent project-level evaluation and planning documentation.

Alternative A Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative B. As described in Alternative A above, cumulative impacts associated with navigation from other cumulative projects would be less than significant/beneficial. The cumulative impacts associated with Alternative B would be identical to those described for Alternative A, with the addition of navigation benefits provided by Alternative B in Ravenswood Slough in the Ravenswood pond complex; and Stevens Creek, Mountain View Slough and Charleston Slough in the Alviso pond complex (see SBSP Impact 3.3-5 in Section 3.3). The planned nature of the breaches along Alviso Slough under Alternative B would also increase the self-sustainability of the navigation benefits associated with the channel enlargement and vegetation removal of the Alviso Slough Restoration Project. As with Alternative A, navigation access to breached ponds would not be allowed unless a compatibility determination was performed allowing such access. As such, Alternative B's contribution to cumulative impacts associated with navigation would be beneficial, and cumulative impacts of Alternative B and other cumulative projects would be less than significant/beneficial.

Alternative B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative C. The cumulative impacts associated with Alternative C would be identical to those described for Alternatives A and B, with the addition of navigation benefits provided by Alternative C in Coyote Creek, Mud Slough, and Artesian Slough. Alviso Slough would scour deeper and wider under Alternative C than under Alternative B, further increasing the self-sustainability of the navigation benefits provided by the Alviso Slough Restoration Project. As with Alternatives A and B, navigation access to breached ponds would not be allowed unless a compatibility determination was performed allowing such access. Alternative C's contribution to cumulative impacts associated with navigation would be beneficial, and cumulative impacts of Alternative C and other cumulative projects would be less than significant/beneficial.

Alternative C Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Phase 1 No Action. As described in Alternative A above, cumulative impacts associated with navigation from other cumulative projects would be less than significant/beneficial. Limited additional navigation benefits would be expected in Mt. Eden Creek, North Creek and OAC in the Eden Landing pond complex, and Alviso and Guadalupe Sloughs in the Alviso pond complex as a result of the Phase 1 No Action (see SBSP Impact 3.3-2 in Section 3.3.). As such, the Phase 1 No Action's contribution to cumulative impacts associated with navigation would be less than significant/beneficial. The cumulative impacts of the Phase 1 No Action and other cumulative projects would be less than significant/beneficial in the Eden Landing and Alviso pond complexes, and less than significant in the Ravenswood pond complex. As with the program-level cumulative impacts, navigation access to breached ponds would not be allowed unless a compatibility determination was performed allowing such access.

Phase 1 No Action Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Phase 1 Actions. As described in Alternative A above, cumulative impacts associated with navigation from other cumulative projects would be less than significant/beneficial. Implementation of the Phase 1 actions would result in limited beneficial impacts in Mt. Eden Creek, North Creek and OAC in the Eden Landing pond complex, and Alviso Slough in the Alviso pond complex. As such, the Phase 1 action's contribution to cumulative impacts associated with navigation would be less than significant/beneficial. The cumulative impacts of the Phase 1 actions and other cumulative projects would be less than significant/beneficial in the Eden Landing and Alviso pond complexes, and less than significant in the Ravenswood pond complex. As with the program-level cumulative impacts for Alternatives A and B, navigation access to breached ponds would not be allowed unless a compatibility determination was performed allowing such access.

Phase 1 Actions Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Surface Water, Sediment, and Groundwater Quality

Cumulative Impact 3.4-1: **Changes in algal abundance and composition, which could in turn degrade water quality by lowering DO and/or promoting the growth of nuisance species.**

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. Ponds also may have unusual algal species, some of which can cause harm or nuisance if introduced to the Bay. Some of these effects may occur under the No Action Alternative if levees breach inadvertently due to restricted maintenance. Other cumulative tidal habitat restoration projects have the potential to cause similar impacts.

As discussed in Section 3.4, Surface Water, Sediment and Groundwater Quality, and the Nutrients and Contaminants Analysis Report (Appendix H), 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 opening of new breaches between ponds and Bay waters, thereby inoculating the Bay with 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.

Alternative A. While many of the cumulative projects analyzed would not introduce significant risk factors such as biostimulation or breaches between ponds and the Bay, some of the cumulative projects analyzed, in particular the cumulative tidal restoration projects, would result in potentially significant impacts. For example, the Shoreline Study could involve tidal restoration that converts managed ponds to tidal wetlands. Decreased turbidity outside of breached ponds due to sediment accumulation within the

pond could stimulate algal growth outside the breach. The Invasive Spartina Project is an example of a project that could introduce glyphosate or other chemicals that are toxic to algae, resulting in shifts in algal composition. Because levee breaches and subsequent changes in algae abundance/composition would occur under Alternative A (see SBSP Impact 3.4-1 in Section 3.4), this alternative's contribution to cumulative impacts would be potentially significant. Therefore, the cumulative impacts of Alternative A and other cumulative projects would be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As described in Alternative A above, the cumulative projects analyzed would result in a potentially significant cumulative impact on algal abundance and composition.

Implementation of Alternative B, in combination with monitoring and the Adaptive Management Plan (see also SBSP Impact 3.4-1 in Section 3.4, Surface Water, Sediment and Groundwater Quality, and Appendix D), would result in a less than significant impact on phytoplankton abundance and composition. The cumulative impacts of Alternative B and other cumulative projects would be potentially significant.

Alternative B Level of Significance: Potentially Significant

Alternative C. The cumulative impacts associated with Alternative C would be identical to those described for Alternative B.

Alternative C Level of Significance: Potentially Significant

Phase 1 No Action. As described in Alternative A above the cumulative projects analyzed would result in a potentially significant cumulative impact on algal abundance and composition. Because levee breaches could occur under Phase 1 No Action, algae abundance and composition could change, thus resulting in a potentially significant impact. Alternative B's contribution to cumulative impacts associated with changes in algal abundance and composition would be potentially significant, and cumulative impacts associated with the Phase 1 No Action and other cumulative projects would be potentially significant.

Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 Actions.

Eden Landing: As described in Alternative A above, other cumulative projects in the vicinity of the SBSP Restoration Project Area would result in potentially significant impacts on algal abundance and composition. Implementation of the Phase 1 actions, in combination with the monitoring and maintenance and the Adaptive Management Plan (see also Phase 1 Impact 3.4-1 and Appendix D), would result in a less-than-significant impact associated with changes in algal abundance or composition. The cumulative impacts of Phase 1 actions at Eden Landing and other cumulative projects would be potentially significant even though the impacts of the Phase 1 actions would be less than significant.

Alviso: As described in Alternative A above, other cumulative projects in the vicinity of the SBSP Restoration Project Area would result in potentially significant impacts on algal abundance and composition. Implementation of the Phase 1 actions, in combination with the monitoring and maintenance and the Adaptive Management Plan (see also Phase 1 Impact 3.4-1 and Appendix D), would result in a less-than-significant impact associated with changes in algal abundance or composition. The cumulative impacts of all projects would be potentially significant even though the impacts of the Phase 1 actions would be less than significant.

Ravenswood: As described in Alternative A above, other cumulative projects in the vicinity of the SBSP Restoration Project Area would result in potentially significant impacts on algal abundance and composition. Implementation of the Phase 1 actions, in combination with the monitoring and maintenance and the Adaptive Management Plan (see Phase 1 Impact 3.4-1 and Appendix D), would result in a less-than-significant impact associated with changes in algal abundance or composition. The cumulative impacts of all projects would be potentially significant even though the impacts of the Phase 1 actions would be less than significant.

Phase 1 Actions Level of Significance: Potentially Significant

---

Cumulative Impact 3.4-2: **Potential to cause localized, seasonally low DO levels as a result of algal blooms, increased microbial activity, or increased residence time of water.**

Experience through the ISP shows that managed ponds have the potential for increased phytoplankton blooms and accumulation of algal mats on the leeward end of ponds with long fetches. The resulting accumulation of organic matter leads to increased respiratory demand for oxygen, and can cause DO to sag in stagnant or slow moving waters. This can lead to significant increases in the discharge of chemical oxygen demand (COD) and biochemical oxygen demand (BOD) from restored areas into the Bay.

Risk factors in the analysis of the other cumulative projects include the potential for discharge of BOD cumulative to the SBSP Restoration Project. In addition, projects that have the potential to increase COD by mobilizing anoxic bottom sediments introduce the potential for cumulative impacts. Cumulative impacts for this issue are primarily focused in the far South Bay, south of the Dumbarton Bridge, where hydraulic residence times are low. In more northerly areas of the Bay, high energy mixing dynamics ameliorate the discharge of BOD from multiple restoration projects.

The SBSP Restoration Project's Adaptive Management Plan would include modeling to assess current and future loads of BOD and COD, and the associated effect on DO levels in lower South Bay. Triggers for adaptive management actions would be established to avoid significant impacts. The triggers would cause adaptive management actions by the SBSP Restoration Project regardless of whether they were caused by the SBSP Restoration Project or by other cumulative projects.

Alternative A. Over the long term, low DO is primarily related to the risk factor of BOD/COD discharge from ponds, sloughs and tidal marshes into the Bay. Discharge of COD resulting from dredging and/or vegetation removal is a short-term impact due to the transient nature of such activities and their effects.

Many of the cumulative projects would have no impact or less-than-significant impacts when considering the long-term cumulative impacts of discharge of BOD and/or COD into the Bay, because they would not involve opening breaches between ponds and the Bay. Some would, including the ELER Restoration Project and the ISP. The ISP and the ELER Restoration Project include management of existing ponds that discharge into the Bay. Without appropriate adaptive management, it is assumed that other cumulative projects would have potentially significant impacts. Alternative A's contribution to cumulative impacts would be potentially significant (see SBSP Impact 3.4-2 in Section 3.4). Therefore, the cumulative impacts of Alternative A and other cumulative projects would be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As described in Alternative A above, cumulative projects would result in potentially significant impacts. Implementation of Alternative B, in combination with the monitoring and the Adaptive Management Plan (see discussion of SBSP Impact 3.4-1 in Section 3.4, Surface Water, Sediment and Groundwater Quality, and Appendix D), would result in a less-than-significant impact on phytoplankton abundance and composition. Because other cumulative projects that contributed to the level of significance finding for Alternative A (the ISP and the ELER Restoration Project) would be managed with the SBSP Restoration Project under Alternative B[1], the cumulative impacts of Alternative B and other cumulative projects would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. Since Alternative C would result in greater conversion of pond habitat to tidal habitat, cumulative impacts would be expected to be less than those described under Alternative B. Fewer managed ponds would mean fewer opportunities to build up elevated BOD/COD in discharges from water control structures into the Bay.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. As described in Alternative A above, cumulative projects would result in potentially significant impacts. The Phase 1 No Action's contribution to cumulative impacts would be potentially significant (see SBSP Impact 3.4-2 in Section 3.4).

Therefore, the cumulative impacts of Phase 1 No Action and other cumulative projects would be potentially significant.

Phase 1 No Action Level of Significance: Potentially Significant

[1] The ISP will be replaced by the SBSP Restoration Project if the SBSP Restoration Project is approved.

Phase 1 Actions.

Eden Landing: As described in Alternative A above, cumulative projects would result in potentially significant impacts. Implementation of the Phase 1 actions, in combination with the monitoring and maintenance and the Adaptive Management Plan (see Phase 1 Impact 3.4-2 and Appendix D), would result in a less-than-significant impact associated with low DO. Cumulative impacts of the Phase 1 actions and other cumulative projects would be potentially significant.

Alviso: As described in Alternative A above, cumulative projects would result in potentially significant impacts. Implementation of the Phase 1 actions, in combination with the monitoring and maintenance and the Adaptive Management Plan (see Phase 1 Impact 3.4-2 and Appendix D), would result in a less-than-significant impact associated with low DO. Cumulative impacts of Phase 1 actions at the Alviso pond complex and other cumulative projects would be potentially significant.

Ravenswood: As described in Alternative A above, cumulative projects would result in potentially significant impacts. Implementation of the Phase 1 actions, in combination with the monitoring and maintenance and the Adaptive Management Plan (see Phase 1 Impact 3.4-2 and Appendix D), would result in a less-than-significant impact associated with low DO. Cumulative impacts of the Phase 1 actions and other cumulative projects would be potentially significant.

Phase 1 Actions Level of Significance: Potentially Significant

---

Cumulative Impact 3.4-3: **Potential to mobilize, transport, and deposit mercury-contaminated sediments, leading to exceedance of numeric water quality objectives, TMDL allocations, and sediment quality guidelines for total mercury.**

Mobilization and transport of mercury-contaminated sediments is a regional issue proposed to be regulated by the Bay TMDL requirement to drive down the inventory of mercury in the actively resuspended sediment layer. This is of greatest concern in the far South Bay, where sediment residence times are extremely long and there are many areas known or suspected to have mercury-contaminated sediments from the legacy of the New Almaden mercury mines. Mobilization and transport of mercury-contaminated sediments into the northern reach of the Bay would have little effect on the recovery rate of sediments in South Bay, so only other cumulative projects south of the Bay Bridge are analyzed for cumulative impacts.

Of all the Regional TMDLs, the Bay Mercury TMDL is farthest along in the regulatory process, having been adopted by the San Francisco Bay Regional Water Quality Control Board (RWQCB) in August of 2006. The Bay Mercury TMDL includes an implementation plan with provisions to avoid exceedance of Water Quality Objectives and TMDL allocations. One of the cumulative projects, the Lower Guadalupe River Flood Protection Project, incorporated sediment targets proposed by the Bay Mercury TMDL in the Soil Management Plan in 2001, five years before the TMDL was adopted. The Bay Mercury TMDL was approved by the State Water Resources Control Board (SWRCB) on July 17, 2007. Approval by the

State Office of Administrative Law and the US Environmental Protection Agency is necessary to complete the formal process for adopting the TMDL Basin Plan amendments, which typically occurs within six to twelve months after SWRCB approval.

Alternative A. The risk factors for mobilization and transport of mercury-contaminated sediments are projects that would involve substantial earthmoving and dredging activities or that would enhance tidal scour and that are located near known or suspected sources of mercury-contaminated sediments. Many of the other cumulative projects would have no impact when considering the long term cumulative impacts of mobilization and transport of mercury contaminated sediments because they do not involve earthmoving, dredging, or scour exposure in areas known or suspected to contain mercury contaminated sediments. Some projects would, but also include appropriate monitoring tools and associated management actions, which would render the impacts less than significant. Examples of this include the Lower Guadalupe River Flood Protection Project, the Alviso Slough Restoration Project, and the Invasive Spartina Project. Others, such as the Shoreline Study, do not as yet have well-defined adaptive management plans, and therefore have potentially significant impacts. On balance, the cumulative impacts of other cumulative projects would be potentially significant. Alternative A's contribution to cumulative impacts associated with mercury-contaminated sediments would be potentially significant (see SBSP Impact 3.4-3 in Section 3.3.). Therefore, cumulative impacts of Alternative A and other cumulative projects would be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As discussed under Alternative A, above, the cumulative projects analyzed would result in potentially significant cumulative impacts. Implementation of Alternative B, in combination with the monitoring and the Adaptive Management Plan (see discussion of SBSP Impact 3.4-3 in Section 3.4, Surface Water, Sediment and Groundwater Quality, and Appendix D), would result in less-than-significant impacts on the mobilization and transport of mercury-contaminated sediments. While Alternative B alone would have a less-than-significant impact, the cumulative impacts of Alternative B and other cumulative projects analyzed would be potentially significant.

Alternative B Level of Significance: Potentially Significant

Alternative C. Although Alternative C would result in greater conversion of pond habitat to tidal habitat, cumulative impacts would otherwise be the same as those described under Alternative B.

Alternative C Level of Significance: Potentially Significant

Phase 1 No Action. Even though cumulative project activities that comply with the Bay Mercury TMDL would reduce mercury concentrations in Bay suspended sediments over the long term, short-term exceedances of numeric water quality objectives may result from dredging, excavating, earthmoving, vegetation removal or other sediment-mobilizing activities. The greatest risk factor for short-term exceedances is dredging and other earthmoving activities in the far South Bay, where elevated mercury concentrations in sediments are found. However, even natural re-suspension of ambient Bay sediments is

known to cause exceedance of water quality objectives, so any sediment-mobilizing activities have the potential for short-term impacts.

The Phase 1 ponds are located near other cumulative projects that involve dredging, excavating, earthmoving, or vegetation removal timed. These include the Shoreline Study, the PG&E Pond A6 Tower and Boardwalk Modification Project, the Dumbarton Corridor Rail Project, the Bay Division Pipeline Reliability Upgrade Project, and the Boat Launch Facility at Alviso Marina County Park. Therefore, impacts due to short-term exceedances of water quality objectives caused by mobilization and transport of mercury-contaminated sediments from other cumulative projects would be potentially significant without appropriate monitoring and adaptive management actions in place. The Phase 1 No Action's contribution to cumulative impacts associated with mercury-contaminated sediments would be potentially significant (see Phase 1 Impact 3.4-3). The cumulative impacts of the Phase 1 No Action and other cumulative projects would be potentially significant.

Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 Actions

Eden Landing: As discussed in Phase 1 No Actions above, impacts due to short-term exceedances of water quality objectives caused by mobilization and transport of mercury-contaminated sediments from other cumulative projects would be potentially significant. The Adaptive Management Plan developed by the SBSP Restoration Project would include monitoring tools and adaptive management actions to avoid impacts, so the impacts resulting from the Phase 1 actions would be less than significant (see Phase 1 Impact 3.4-3). Therefore, cumulative impacts from Phase 1 actions and other cumulative projects, would be potentially significant.

Alviso: As discussed in Phase 1 No Actions above, impacts due to short-term exceedances of water quality objectives caused by mobilization and transport of mercury-contaminated sediments from other cumulative projects would be potentially significant. The Adaptive Management Plan developed by the SBSP Restoration Project would include monitoring tools and adaptive management actions to avoid impacts, so the impacts resulting from the Phase 1 actions would be less than significant (see Phase 1 Impact 3.4-3). Therefore, cumulative impacts from Phase 1 actions and other cumulative projects, would be potentially significant.

Ravenswood: As discussed in Phase 1 No Actions above, impacts due to short-term exceedances of water quality objectives caused by mobilization and transport of mercury-contaminated sediments from other cumulative projects would be potentially significant. The Adaptive Management Plan developed by the SBSP Restoration Project would include monitoring tools and adaptive management actions to avoid impacts, so the impacts resulting from the Phase 1 actions would be less than significant (see Phase 1 Impact 3.4-3). Therefore, cumulative impacts from Phase 1 actions and other cumulative projects, would be potentially significant.

Phase 1 Actions Level of Significance: Potentially Significant

Cumulative Impact 3.4-4: **Potential increase in net methylmercury production and bioaccumulation in the food web.**

Alternative A. Many of the other cumulative projects would not introduce significant risk factors such as tidal wetland restoration, pond management, or alteration of vegetation, and were therefore predicted to have no impact on net mercury methylation and bioaccumulation. Some 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 adaptive management plan, or the monitoring tools and adaptive management actions for those projects have not yet been defined. The Shoreline Study and the ELER Restoration Project have ecosystem restoration components that could involve pond management or tidal wetland restoration. The ISP involves pond management. The Invasive Spartina Project and the Alviso Slough Restoration Project involve changing vegetative habitat. One of these other cumulative projects, the Alviso Slough Restoration Project, has coordinated with the South Baylands Mercury Project, which is an adaptive management study that has commenced prior to initiating Phase 1 actions. The other cumulative projects listed above do not yet have defined adaptive management plans in place. For the purposes of this analysis, it is assumed that the other cumulative projects would have potentially significant impacts. Alternative A's contribution to cumulative impacts associated with coastal flood risk would be potentially significant (see SBSP Impact 3.4-4 in Section 3.4). Therefore, the cumulative impacts of Alternative A and other cumulative projects would be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As discussed under Alternative A, above, the cumulative projects analyzed would result in potentially significant cumulative impacts. Implementation of Alternative B, in combination with the monitoring and the Adaptive Management Plan (see discussion of SBSP Impact 3.4-1 in Section 3.4, Surface Water, Sediment and Groundwater Quality, and Appendix D), would result in less-than-significant impacts on net mercury methylation and bioaccumulation. While Alternative B alone would have a less-than-significant impact, the cumulative impacts of Alternative B and other cumulative projects would be potentially significant.

Alternative B Level of Significance: Potentially Significant

Alternative C. Although Alternative C would result in greater conversion of pond habitat to tidal habitat, cumulative impacts would otherwise be the same as those described under Alternative B. Because of the complexity of mercury methylation and bioaccumulation, it is not known whether Alternative C would have a greater negative impact than Alternative B for this potential impact. This would be determined by the Adaptive Management Plan if the SBSP Restoration Project is implemented.

Alternative C Level of Significance: Potentially Significant

Phase 1 No Action. As discussed above, the other cumulative projects would have potentially significant impacts on net mercury methylation and bioaccumulation. The Phase 1 No Action's contribution to cumulative impacts associated with net mercury methylation and bioaccumulation would be potentially significant (see Phase1 Impact 3.4-4.). Therefore, cumulative impacts of the Phase 1 No Action and other cumulative projects would be potentially significant.

Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 Actions.

Eden Landing. As discussed above, the other cumulative projects would have potentially significant impacts on net mercury methylation and bioaccumulation. The Adaptive Management Plan developed by the SBSP Restoration Project would include monitoring tools and adaptive management actions to avoid impacts due to net mercury methylation and bioaccumulation, so impacts resulting from the Phase 1 actions would be less than significant (see Phase 1 Impact 3.4-4). Therefore, the cumulative impacts of the Phase 1 actions and other cumulative projects would be potentially significant.

Alviso: As discussed above, the other cumulative projects would have potentially significant impacts on net mercury methylation and bioaccumulation. The Adaptive Management Plan developed by the SBSP Restoration Project would include monitoring tools and adaptive management actions to avoid impacts due to net mercury methylation and bioaccumulation, so impacts resulting from the Phase 1 actions would be less than significant (see Phase 1 Impact 3.4-4). Therefore, the cumulative impacts of the Phase 1 actions and other cumulative projects would be potentially significant.

Ravenswood: As discussed above, the other cumulative projects would have potentially significant impacts on net mercury methylation and bioaccumulation. The Adaptive Management Plan developed by the SBSP Restoration Project would include monitoring tools and adaptive management actions to avoid impacts due to net mercury methylation and bioaccumulation, so impacts resulting from the Phase 1 actions would be less than significant (see Phase 1 Impact 3.4-4). Therefore, the cumulative impacts of the Phase 1 actions and other cumulative projects would be potentially significant.

Phase 1 Action Level of Significance: Potentially Significant

---

Cumulative Impact 3.4-5: **Potential impacts to water quality from other contaminants.**

"Other contaminants" covers a broad category of pollutants that have impacts which are expected to be avoided or mitigated by the SBSP Restoration Project. Pollutants analyzed in this EIS/R include discharges from construction activities, selenium, hazardous materials from maintenance activities, trash, particle-associated contaminants such as PCBs and legacy pesticides, bacteria, groundwater contaminants such as solvents, and urban runoff.

Discharges from construction-related activities include sediments and spills of fuel and oil. These can introduce unwanted pollutants in stormwater that violate water quality standards. Impacts due to

construction-related activities can be mitigated by appropriate stormwater pollution prevention plans, including a plan for safe refueling of vehicles and spill containment plans.

Mobilization of high selenium groundwater is an issue primarily in the far South Bay only, because occurrence of high selenium groundwater appears to be confined to that area. In the South Bay, areas where high selenium groundwater can impinge due to SBSP Restoration Project activities would also be at risk from other cumulative projects. Consistent with selenium management in groundwater discharges in Southern California (Orange County), selenium impacts can be mitigated by monitoring chemical forms of selenium in water, sediments, and the food web, development of food web models linking concentrations in water and sediments to concentrations in biota, and development of management plans to avoid harmful selenium bioaccumulation.

Activities that involve handling, transport or removal of hazardous materials are at risk of inadvertent spills, potentially exposing organisms and contaminating the Project Area. This can be mitigated by including an appropriate hazardous materials management plan with any activity that involves handling, transport or removal of hazardous materials.

The risk factors for mobilization and transport of sediments contaminated with PCBs, legacy pesticides, and other particle-associated pollutants are earthmoving, dredging, or creation of tidal scour in areas with known or suspected contamination. This is a regional issue of concern that would likely be managed similarly to mercury-contaminated sediments. Conceptual models developed and draft TMDL reports relevant to the Bay suggest that the long term strategy will be to model the linkage between sediment concentrations of these pollutants in the Bay and biota, monitor sediments and biota, and work to reduce or eliminate discharges and other activities that increase concentrations of particle-associated pollutants in the Bay. Because these proposals are still in draft form, the appropriate mitigation is to ensure that activities will comply with emerging regulations as they are adopted.

Trash is a concern because it is unsightly and degrades habitat. Increased recreational access is the primary risk factor for this pollutant. The mitigation for trash is to ensure litter laws are enforced, provide adequate disposal facilities, ensure regular maintenance removal and cleanup, and organize community-based cleanup and awareness events. Total Maximum Daily Loads for trash in various urban creeks in the Project Area may mitigate this concern.

Urban runoff carries pollutants such as oil, grease, trash, metals, bacteria and pesticides from paved areas into receiving waters. Risk factors for urban runoff contamination include projects that introduce urban runoff to wetlands, ponds, or the Bay without attenuation by detention basins, grassy swales, infiltration ponds, or other best management practices. The San Francisco Bay RWQCB has a coordinated program of permitting and enforcement to regulate stormwater discharges. However, because it is unknown whether policies and regulations prohibiting the discharge of pollutants are carried out, significant impacts are assumed to occur.

Bacteria can grow in stagnant waters such as ponds and sloughs. This is a concern for water contact recreation and shellfish harvesting. Although shellfish harvesting is prohibited by County Health ordinances in the Project Area, there is anecdotal evidence it still occurs for food consumption. The

appropriate mitigation is to ensure adequate water monitoring for bacteria, posting of danger signs in points of water contact or shellfish harvesting access, and a program of education and outreach to ensure that people understand the risks of swimming and consuming shellfish from areas where high bacteria counts are found.

Alternative A. All of the above contaminant impacts and associated related mitigation measures are discussed in Section 3.4, Surface Water, Sediment and Groundwater Quality. 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 PCBs and legacy pesticides, it is assumed that other cumulative projects would result in potentially significant water quality impacts from other contaminants. Alternative A's contribution to cumulative impacts associated with water quality from other contaminants would be potentially significant (see SBSP Impact 3.4-5 in Section 3.5). Cumulative impacts of Alternative A and other cumulative projects would be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As described in Alternative A above, other cumulative projects would result in potentially significant water quality impacts from other contaminants. Alternative B's contribution to cumulative impacts associated with water quality impacts from other contaminants would be less than significant (see SBSP Impact 3.4-5). However, the cumulative impacts of Alternative B and other cumulative projects would be potentially significant.

Alternative B Level of Significance: Potentially Significant

Alternative C. Although Alternative C would result in greater conversion of pond habitat to tidal habitat, cumulative impacts would otherwise be the same as those described under Alternative B.

Alternative C Level of Significance: Potentially Significant

Phase 1 No Action. The discussion for Phase 1 No Action is the same as for Alternative A.

Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 Actions

Eden Landing. As described in Alternative A above, other cumulative projects would result in potentially significant water quality impacts from other contaminants. As discussed in Phase 1 Impact 3.4-5, the Phase 1 actions include proposed mitigation measures for all other contaminants considered, so the impact resulting from the Phase 1 actions alone would be less than significant. However, cumulative impacts of the Phase 1 actions and other cumulative projects would be potentially significant.

Alviso: As described in Alternative A above, other cumulative projects would result in potentially significant water quality impacts from other contaminants. As discussed in Phase 1 Impact 3.4-5, the Phase 1 actions include proposed mitigation measures for all other contaminants considered, so the

impact resulting from the Phase 1 actions alone would be less than significant. However, cumulative impacts of the Phase 1 actions and other cumulative projects would be potentially significant.

Ravenswood: As described in Alternative A above, other cumulative projects would result in potentially significant water quality impacts from other contaminants. As discussed in Phase 1 Impact 3.4-5, the Phase 1 actions include proposed mitigation measures for all other contaminants considered, so the impact resulting from the Phase 1 actions alone would be less than significant. However, cumulative impacts of the Phase 1 actions and other cumulative projects would be potentially significant.

Phase 1 Actions Level of Significance: Potentially Significant

---

Cumulative Impact 3.4-6: **Potential to cause seawater intrusion of regional groundwater sources.**

Project activities that bring salty water towards conduits between surface water and groundwater have the potential to introduce salt into potable water supplies. This would not be a risk as long as groundwater overdraft does not occur. Conduits between surface and groundwater can include naturally porous sediment formations and improperly abandoned wells. Dredging activities can also potentially introduce saltwater into shallow aquifers by penetrating the Recent Bay Mud layer, which can move laterally towards existing conduits.

Alternative A. Many of the other cumulative projects analyzed were found to have no impact on groundwater resources. The potential for cumulative impacts for this issue is low for projects that are appreciably separated. Groundwater does not communicate between basins, so other project activities in the north and central Bay would not affect groundwater resources in the south Bay. Some of the other cumulative projects have risk factors associated with saltwater intrusion into groundwater. The Shoreline Study has an ecosystem restoration component that may bring saltwater closer to conduits between shallow and deep aquifers. The Alviso Slough Restoration Project could increase the tidal prism of Alviso Slough, bringing salt water landward. The Bay Division Pipeline Reliability Upgrade Project involves tunnel construction activities that have the potential to open new conduits between shallow and deep aquifers. As such, cumulative impacts of other cumulative projects would be potentially significant. Alternative A's contribution to cumulative impacts on groundwater resources would be less than significant (see SBSP Impact 3.4-6 in Section 3.4), although cumulative impacts of Alternative A and other cumulative projects would be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As described in Alternative A above, cumulative impacts of other cumulative projects would be potentially significant. Mitigation Measure 3.4-6 identified for Alternative B in SBSP Impact 3.4-6 would ensure avoidance of groundwater overdraft in the region, and closure of man-made conduits within the SBSP Restoration Project Area. Alternative B's contribution to cumulative impacts on groundwater resources would be less than significant. Mitigation measures undertaken by the SBSP Restoration Project to avoid groundwater overdraft would concurrently mitigate cumulative impacts. The

reason that SBSP Restoration Project mitigations would prevent impacts to groundwater is that groundwater management is a regional issue. Assuming that the SBSP mitigation measures to prevent groundwater overdraft are successful, cumulative projects would also be mitigated. Cumulative impacts of Alternative B and other cumulative projects would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. The cumulative impacts associated with Alternative C would be identified to those described for alternative B.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action.

Eden Landing: Presently, groundwater within the Eden Landing pond complex is not overdrafted so groundwater flows into the Bay. Natural and artificial pathways exist, as evidenced by the salinity anomaly in the vicinity of ponds E12 and E13. As described in Alternative A above, cumulative impacts of other cumulative projects would be potentially significant. The Phase 1 No Action's contribution to cumulative impacts associated with seawater intrusion would be potentially significant (see Phase 1 Impact 3.4-6). Therefore, cumulative impacts of Phase 1 No Action and other cumulative projects would be potentially significant.

Eden Landing Phase 1 No Action Level of Significance: Potentially Significant

Alviso: The Alviso Slough Restoration Project may increase the tidal prism of the slough, moving seawater landward in the Alviso pond complex. As described in Alternative A above, cumulative impacts of other cumulative projects would be potentially significant. The Phase 1 No Action's contribution to cumulative impacts associated with seawater intrusion would be potentially significant (see Phase 1 Impact 3.4-6). Therefore, cumulative impacts of Phase 1 No Action and other cumulative projects would be potentially significant.

Alviso Phase 1 No Action Level of Significance: Potentially Significant

Ravenswood: The Bay Division Pipeline Extension Reliability Upgrade Project has the potential to introduce new conduits between shallow aquifers and deeper aquifers in the Ravenswood pond complex. As described in Alternative A above, cumulative impacts of other cumulative projects would be potentially significant. The Phase 1 No Action's contribution to cumulative impacts associated with seawater intrusion would be potentially significant (see Phase 1 Impact 3.4-6). Therefore, cumulative impacts of Phase 1 No Action and other cumulative projects would be potentially significant.

Ravenswood Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 Actions

Eden Landing. As described in Alternative A above, cumulative impacts of other cumulative projects would be potentially significant. Mitigation measures presented in Section 3.4, Surface Water, Sediment and Groundwater Quality, are intended to prevent groundwater overdraft and to identify and properly abandon wells than can be conduits between shallow and deep aquifers. Implementation of these mitigation measures would reduce impacts resulting from the Phase 1 actions to less-than-significant levels (see Phase 1 Impact 3.4-6) by preventing groundwater overdraft. These mitigation measures would also reduce impacts from other cumulative projects to less-than-significant levels, because groundwater management to prevent overdraft is a regional issue. Therefore, the cumulative impacts of the Phase 1 actions and other cumulative projects would be less than significant.

Alviso: As described in Alternative A above, cumulative impacts of other cumulative projects would be potentially significant. Mitigation measures presented in Section 3.4, Surface Water, Sediment and Groundwater Quality, are intended to prevent groundwater overdraft and to identify and properly abandon wells than can be conduits between shallow and deep aquifers. Implementation of these mitigation measures would reduce impacts resulting from the Phase 1 actions to less-than-significant levels (see Phase 1 Impact 3.4-6) by preventing groundwater overdraft. These mitigation measures would also reduce impacts from other cumulative projects to less-than-significant levels, because groundwater management to prevent overdraft is a regional issue. Therefore, the cumulative impacts of the Phase 1 actions and other cumulative projects would be less than significant.

Ravenswood: As described in Alternative A above, cumulative impacts of other cumulative projects would be potentially significant. Mitigation measures presented in Section 3.4, Surface Water, Sediment and Groundwater Quality, are intended to prevent groundwater overdraft and to identify and properly abandon wells than can be conduits between shallow and deep aquifers. Implementation of these mitigation measures would reduce impacts resulting from the Phase 1 actions to less-than-significant levels (see Phase 1 Impact 3.4-6) by preventing groundwater overdraft. These mitigation measures would also reduce impacts from other cumulative projects to less-than-significant levels, because groundwater management to prevent overdraft is a regional issue. Therefore, the cumulative impacts of the Phase 1 actions and other cumulative projects would be less than significant.

Phase 1 Actions Level of Significance: Less than Significant

Geology, Soils, and Seismicity

Cumulative Impact 3.5-1: **Potential effects from settlement and subsidence due to consolidation of Bay mud.**

Alternative A. Due to the location of the SBSP Restoration Project, only flood management projects are considered in the cumulative analysis. Other cumulative flood management projects would be designed to maintain or improve levels of flood protection, and as such would consider local ongoing and future settlement and subsidence from consolidation of Bay Mud as part of its design and construction. Potential

cumulative impacts associated with other flood management projects would therefore be considered less than significant. Utility projects that would be constructed within the SBSP Restoration Project Area would also likely consider local ongoing and future subsidence.

As discussed in SBSP Impact 3.5-1 in Section 3.5, levees within the SBSP Restoration Project Area that are not a priority to maintain would be increasingly prone to failure over the next 50 years due to continued degradation. In addition, existing Project Areas located adjacent to improved levees (from other cumulative projects) may be subject to a higher magnitude and rate of settlement from the new earthen or structural loads; accelerated settlement would occur likely only in isolated areas (most flood management projects in the same locations would likely be coordinated in design and construction). The contribution of Alternative A to cumulative impacts would be potentially significant. Therefore, cumulative impacts associated with settlement of Bay Mud from Alternative A and other cumulative projects in combination would also be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As described above, potential cumulative impacts associated with other flood management projects would be less than significant.

As described in SBSP Impact 3.5.1, in tidal areas, there would be no maintenance to repair and raise portions of levees that have settled to, or below, minimum elevations required for flood protection. In managed shallow pond areas, certain levees would be maintained and raised as necessary to ensure minimum elevations. In addition, new inboard levees that provide flood protection would be designed and constructed to account for ongoing and future subsidence. The contribution of Alternative B to cumulative impacts would be less than significant/beneficial. Therefore, the cumulative impacts of Alternative B and other cumulative projects would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C Although Alternative C would result in greater conversion of pond habitat to tidal habitat, cumulative impacts would otherwise be the same as those described under Alternative B.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. As described above, potential cumulative impacts associated with other flood management projects would be less than significant.

As described in Cumulative Impact 3.5-1 for Alternative A, the No Action Alternative would contribute to potentially significant impacts in the context of cumulative impacts. Therefore, cumulative impacts from the implementation of Alternative Phase 1 No Action and other cumulative projects would also be potentially significant.

Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 Actions. As described above, potential cumulative impacts associated with other flood management projects would be less than significant.

As described in Phase 1 Impact 3.5-1, because levees would be maintained and raised as necessary to ensure minimum elevations, potential effects on people and property from settlement would be less than significant. Therefore, the cumulative impacts of the Phase 1 actions and other cumulative projects would be less than significant.

Phase 1 Actions Level of Significance: Less than Significant

Cumulative Impact 3.5-2: **Potential effects from liquefaction of soils and lateral spreading.**

Alternative A. Due to the location of the SBSP Restoration Project, only flood management projects are considered in the cumulative analysis. Other cumulative flood management projects would be designed to maintain or improve levels of flood protection, and as such would consider ongoing and future settlement from liquefaction as part of its design and construction. Potential cumulative impacts associated with other flood management projects would therefore be considered less than significant.

As described in SBSP Impact 3.5-2 in Section 3.5, under Alternative A, above, potentially significant impacts associated with liquefaction (settlement of levees to below minimum elevations and overtopping as well as levee breaching) could occur. Because the SBSP Restoration Project Area represents a large part of the project region considered in this analysis, the assessment of cumulative impacts associated with liquefaction is driven by the SBSP Restoration Project. Cumulative impacts of Alternative A and other cumulative projects would therefore be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As described above, potential cumulative impacts associated with other flood management projects would be less than significant.

As described in SBSP Impact 3.5-2, although levees intended for tidal areas would not be maintained if liquefaction occurs, levees within managed pond areas would be maintained and improved as necessary to ensure minimum elevations for flood protection and minimum factors of safety against slope failure. In addition, new inboard levees that provide flood protection would be designed and constructed to avoid, reduce or otherwise account for future subsidence from liquefaction. The contribution of Alternative B to cumulative impacts would be less than significant/beneficial. Therefore, cumulative impacts from Alternative B and other cumulative projects in combination would be less than significant/beneficial.

Alternative B Level of Significance: Less than Significant (CEQA), Beneficial (NEPA)

Alternative C. Although Alternative C would result in greater conversion of pond habitat to tidal habitat, cumulative impacts would otherwise be the same as those described under Alternative B.

Alternative C Level of Significance: Less than Significant (CEQA), Beneficial (NEPA)

Phase 1 No Action. As described above, potential cumulative impacts associated with other flood management projects would be less than significant.

As described in Phase 1 Impact 3.5-2, the Phase 1 No Action would result in potentially significant impacts associated with liquefaction. The contribution of project effects from Phase 1 No Action would likely outweigh the less than significant effects of other cumulative projects and result in a potentially significant cumulative impact.

Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 Actions. As described above, potential cumulative impacts associated with other flood management projects would be less than significant.

As described in Phase 1 Impact 3.5-2, because levees within managed pond areas would be repaired after an occurrence of liquefaction or lateral spreading, potential effects on people and property from liquefaction and lateral spreading would be less than significant under the Phase 1 actions. Therefore, the cumulative impacts of the Phase 1 actions and other cumulative projects would be less than significant.

Phase 1 Actions Level of Significance: Less than Significant (CEQA), Beneficial (NEPA)

Cumulative Impact 3.5-3: **Potential effects from tsunami and/or seiche.**

Alternative A. Due to the location of the SBSP Restoration Project, only flood management projects are considered in the cumulative analysis. Although not specifically designed for the purpose, levees that are part of cumulative flood management projects would likely provide some level of tsunami protection should tsunamis occur within the Bay. In addition, due to locations of urban development away from the open Bay (*e.g.*, separated by the SBSP Restoration Project Area), it is likely that the energy of a tsunami surge on urban areas would be reduced by the time it reaches flood protection levees. Due to the location of the other flood protection levees from the open Bay, the strength of these levees, and the national warning system that is in place to provide warnings should a tsunami occur, cumulative impacts from tsunamis would be less than significant.

The SBSP Restoration Project pond complexes abut the Bay, and as such would be more exposed to a tsunami should it occur. As described in SBSP Impact 3.5-3, tsunamis could result in overtopping and erosion of levees and flooding of ponds under Alternative A, above, which would be less than significant due to the availability of a warning system and because habitable structures are not proposed under this alternative. The contribution of effects would be minor, and cumulative impacts associated with the combination of Alternative A and other cumulative projects would be less than significant.

Alternative A Level of Significance: Less than Significant

Alternative B. As described above, cumulative tsunami effects associated with other flood management projects would be less than significant.

As described in SBSP Impact 3.5-3, in areas where a tsunami overtops levees, ponds may be flooded, and erosion of levee slopes may be accelerated. In managed pond areas, some levees may be improved and provide better protection against tsunamis. Other levees may be repaired after a tsunami occurrence. Tsunami impacts under Alternative B would be less than significant/beneficial. Therefore, combined cumulative impacts from Alternative B and other cumulative projects would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. Although Alternative C would result in greater conversion of pond habitat to tidal habitat, cumulative impacts would otherwise be the same as those described under Alternative B.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. As described above, cumulative tsunami effects associated with other flood management projects would be less than significant.

As described for the No Project Alternative, potential impacts would be less than significant. Cumulative impacts for the Phase 1 No Action would also be considered less than significant. Cumulative impacts from the combination of Phase 1 No Action and other cumulative projects would be less than significant.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. As discussed in Phase 1 Impact 3.5-3, in areas where a tsunami overtops levees, ponds may be flooded, and erosion of levee slopes may be accelerated. In managed pond areas, some levees may be improved and provide better protection against tsunamis. Other levees may be repaired after a tsunami occurrence. The contribution of Phase 1 actions would be less than significant. Cumulative impacts from the combination of Phase 1 No Action and other cumulative projects would be less than significant.

Phase 1 Actions Level of Significance: Less than Significant

Cumulative Impact 3.5-4: **Potential for ground and levee failure from fault rupture.**

Alternative A. Due to the location of the SBSP Restoration Project, only flood management projects are considered in the cumulative analysis. To the extent possible, most flood protection levees and other utility projects would be placed outside of known fault zones. Where these projects would be placed within these zones, it may not be possible to design them to avoid the effects of fault rupture. The purpose of flood protection levees is to protect nearby urban areas from flooding effects, and as such, ongoing maintenance of the levees and as needed, emergency actions, would be available to ameliorate adverse effects of ground or levee failure that could result in flooding. Utility projects are typically designed with features that reduce the adverse effects of fault rupture. As such, although fault rupture may not be

avoidable, potential effects from fault rupture would likely be less than significant due to the availability of maintenance and design features.

As described in SBSP Impact 3.5-4, an earthquake fault rupture may cause a breach in existing levees at specific Alviso and Ravenswood ponds (Ponds A1, A2W, A16, A17, R1, R2, and SF2), resulting in flooding of nearby areas. Alternative A would result in potentially significant impacts because of insufficient activities to maintain the existing levees or repair in the case of a rupture event. Cumulative impacts of Alternative A and other cumulative projects would be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As described above, potential effects from fault rupture would be less than significant for other cumulative projects.

As described in SBSP Impact 3.5-4, in tidal areas, new flood protection levees would be designed and managed to maintain or improve levels of flood protection landward of the SBSP Restoration Project Area and would be designed to withstand failure from fault rupture. Therefore, Alternative B's contribution to cumulative impacts would be less than significant. Cumulative impacts from implementation of Alternative B and other cumulative projects would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. Although Alternative C would result in greater conversion of pond habitat to tidal habitat, cumulative impacts would otherwise be the same as those described under Alternative B.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action at Eden Landing. As described above, potential effects from fault rupture would be less than significant for other cumulative projects.

As described in Phase 1 Impact 3.5-4, no active or potentially active faults are mapped within the Eden Landing pond complex. Phase 1 No Action would not contribute to cumulative impacts. As such, cumulative impacts associated with Phase 1 No Action at the Eden Landing pond complex and other cumulative projects would be less than significant.

Eden Landing No Actions Level of Significance: Less than Significant

Phase 1 No Action at Alviso. As described above, potential effects from fault rupture would be less than significant for other cumulative projects.

As described in Phase 1 Impact 3.5-4, Phase 1 No Action at the Alviso pond complex would contribute potentially significant impacts because it has the potential to result in flooding due to levee breaches from fault rupture. The cumulative impacts of Phase 1 No Action at the Alviso pond complex and other cumulative projects would be potentially significant.

Alviso No Action Level of Significance: Potentially Significant

Phase 1 No Action at Ravenswood. As described above, potential effects from fault rupture would be less than significant for other cumulative projects.

As described in Phase 1 Impact 3.5-4, Phase 1 No Action at the Ravenswood pond complex would contribute potentially significant impacts because it has the potential to result in flooding due to levee breaches from fault rupture. The cumulative impacts of Phase 1 No Action at the Ravenswood pond complex and other cumulative projects would be potentially significant.

Ravenswood No Action Level of Significance: Potentially Significant

Phase 1 Actions at Eden Landing. As described above, potential effects from fault rupture would be less than significant for other cumulative projects.

As described in Phase 1 Impact 3.5-4, no active or potentially active faults are mapped within the Eden Landing pond complex. Phase 1 actions at the Eden Landing pond complex would not contribute to cumulative impacts. As such, cumulative impacts associated with Phase 1 actions at the Eden Landing pond complex and other cumulative projects would be less than significant.

Eden Landing Phase 1 Actions Level of Significance: Less than Significant

Phase 1 Actions at Alviso. As described above, potential effects from fault rupture would be less than significant for other cumulative projects.

As described in Phase 1 Impact 3.5-4, no new recreational facilities would be placed on top of the fault trace and existing levees would be maintained and repaired as needed. Potential effects on people and property due to a rupture immediately on or adjacent to a fault during an earthquake would be less than significant. Therefore, the cumulative impacts of Phase 1 actions at the Alviso pond complex and other cumulative projects would be less than significant.

Alviso Phase 1 Actions Level of Significance: Less than Significant

Phase 1 Actions at Ravenswood. As described above, potential effects from fault rupture would be less than significant for other cumulative projects.

As described in Phase 1 Impact 3.5-4, no new recreational facilities would be placed on top of the fault trace and existing levees would be maintained and repaired as needed. The potential effects on people and property due to a rupture immediately on or adjacent to a fault during an earthquake would be less than significant. Therefore, the cumulative impacts of Phase 1 actions at the Ravenswood pond complex and other cumulative projects would be less than significant.

Ravenswood Phase 1 Actions Level of Significance: Less than Significant

Cumulative Impact 3.5-5: **Potential effects from consolidation of Bay mud on existing subsurface utility crossings and surface rail crossings.**

Alternative A. Due to the location of the SBSP Restoration Project, only flood management projects are considered in the cumulative analysis. Other cumulative projects do have the potential to affect subsurface utility crossings and surface rail crossings that are located within the pond complexes. Cumulative projects would have to consider the utilities/railroads in the design of proposed improvements, and as such impacts from cumulative projects would be less than significant.

As described in SBSP Impact 3.5-5, under Alternative A, above, limited O&M activities would be required and no new earthen or structural loads would be placed within the Project Area to increase the rate and magnitude of settlement. Potential impacts from Alternative A would be less than significant. The cumulative impacts of Alternative A and other cumulative projects would be less than significant.

Alternative A Level of Significance: Less than Significant

Alternative B. As described above, impacts on utilities/railroads from cumulative projects would be less than significant.

As described in SBSP Impact 3.5-5, impacts to utilities or the railroad would be less than significant as new flood control levees would be designed to account for ongoing and future settlement, including potential effects on existing utility and rail crossings. Cumulative impacts of Alternative B and other cumulative projects would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. Although Alternative C would result in greater conversion of pond habitat to tidal habitat, cumulative impacts would otherwise be the same as those described under Alternative B.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. As described above, impacts on utilities/railroads from cumulative projects would be less than significant.

Because limited O&M activities would be required and no new earthen or structural loads would be placed within the pond complex to increase the rate and magnitude of settlement, potential impacts from the Phase 1 No Action would be less than significant. Cumulative impacts of Phase 1 No Action and other cumulative projects would be less than significant.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Action at Eden Landing. As described above, impacts on utilities/railroads from cumulative projects would be less than significant.

As described in Phase 1 Impact 3.5-5, the placement of new fill for improvements related to the cumulative projects may potentially induce consolidation of Bay Mud, cause additional settlement, and affect the performance (disrupt service) of the utility. However design and construction of the improvements would consider the utility, and potential effects would be less than significant. Cumulative impacts of Phase 1 No Action at the Eden Landing pond complex and other cumulative projects would be less than significant.

Phase 1 Action at Alviso. As described above, impacts on utilities/railroads from cumulative projects would be less than significant.

As described in Phase 1 Impact 3.5-5, the placement of new fill for improvements related to the cumulative projects may potentially induce consolidation of Bay Mud, cause additional settlement, and affect the performance (disrupt service) of the railway. However design and construction of the improvements would consider the railroad crossing, and potential effects would be less than significant. Cumulative impacts of Phase 1 No Action at the Alviso pond complex and other cumulative projects would be less than significant.

Phase 1 Action at Ravenswood. As described above, cumulative impacts on utilities/railroads would be less than significant.

There are no known existing utility or rail crossings within the Ravenswood pond complex. Therefore, no impact would occur. The cumulative impacts of the Phase 1 No Action at the Ravenswood pond complex and other cumulative projects would be less than significant.

Phase 1 Actions Level of Significance: Less than Significant

Biological Resources

Cumulative Impact 3.6-1: **Potential reduction in number of small shorebirds using San Francisco Bay, resulting in substantial declines in flyway-level populations.**

Alternative A. Additional tidal restoration efforts underway or proposed in San Francisco Bay would reduce the availability of high-tide habitat for small shorebirds to some degree. High-tide roosting habitat is unlikely to limit populations, as 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, possibly 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, as the highest numbers of shorebirds using salt ponds in the Bay Area occur in the South Bay.

Also, as discussed in greater detail for Cumulative Impact 3.6-2 below, the sediment demand and scour associated with all the tidal restoration projects in the South Bay, and in particular anticipated sea level

rise, are expected to result in a long-term loss of mudflat area in the South Bay. As discussed in SBSP Impact 3.6-1, South Bay populations of some mudflat-associated species (such as small shorebirds) may not be at or near the carrying capacity of the mudflats, and thus numbers may not track mudflat availability closely. 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. As a result, the extent to which mudflat loss would result in a decline in numbers of small shorebirds that forage primarily on mudflats is uncertain. Nevertheless, 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 impact to small shorebird numbers in the South Bay.

Under the No Action Alternative, potential foraging habitat for small shorebirds would decline due to mudflat loss and the loss of managed pond foraging habitat from unintentional breaching and conversion of unmanaged ponds to vegetated seasonal wetlands. Restoration of former salt ponds to tidal habitats due to unintentional breaching is expected to increase the availability of intertidal mudflat foraging area at low tide in the short-term, as most of the ponds where breaching may occur are sufficiently subsided that they would provide intertidal mudflat habitat for several decades before accreting enough sediment to achieve vegetation colonization. However, in the long term, sedimentation patterns of the South Bay are expected to result in a loss of intertidal mudflat, both due to conversion to emerging fringe marsh (through sedimentation) and conversion to subtidal habitat due to scour and sea level rise (see Table 3.6-5 in Section 3.6, Biological Resources). This mudflat loss is predicted to occur even in the absence of the SBSP Restoration Project, but mudflat loss is expected to be greater if ponds are breached and tidal habitats restored (PWA 2006).

Under the No Action Alternative, no monitoring would be implemented to determine whether the changes in the SBSP Restoration Project Area result in declines in small shorebird numbers, and no adaptive management would be implemented to reverse such declines if they occur. Consequently, Alternative A would result in a potentially significant impact, and the cumulative impact of Alternative A in combination with other tidal restoration projects and sea level rise would be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As discussed for Alternative A, restoration of former salt ponds to tidal habitats as part of other cumulative projects on San Francisco Bay is expected to result in the loss of high-tide foraging habitat for small shorebirds. 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, possibly 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, as the highest numbers of shorebirds using salt ponds in the Bay Area occur in the South Bay. In addition, sea level rise and other tidal restoration projects are expected to result in a loss of mudflats, which provide low-tide foraging habitat for small

shorebirds. Although the extent to which mudflat loss would result in a decline in numbers of small shorebirds that forage primarily on mudflats is uncertain, sea level rise and other restoration projects could potentially result in significant cumulative impacts on small shorebirds.

Following an initial (20–30 years) increase in the availability of intertidal mudflat foraging area at low tide in the short term under Alternative B, intertidal mudflat is expected to decline in the long term due to conversion to emerging fringe marsh (through sedimentation) and conversion to subtidal habitat due to scour and sea level rise.

The adaptive management program to be implemented by the SBSP Restoration Project proposes to establish a monitoring program focused on the South Bay, but with monitoring locations elsewhere in the Bay Area as well, that would establish baseline numbers and variability of the populations over time. The monitoring program would also include aspects that would tie to or contribute to regional and flyway-level programs to detect changes. If such changes are detected, and linked to loss of mudflat habitat (see below), measures can be taken to restore tidal action to additional ponds in a manner that maintains new mudflats over a longer period of time. Alternatively, if the reductions are subsequently linked to loss of high tide foraging habitat, then measures could be implemented to halt or reverse the trend, including additional management of remaining ponds and possibly halting the conversion of additional ponds to tidal habitats. This monitoring and adaptive management program is designed to prevent any cumulative impacts from the SBSP Restoration Project, and it would help to determine whether other projects are also contributing to any cumulative impacts. If monitoring under this program detects a decline in shorebird numbers in the Bay Area as a whole, adaptive management under the SBSP Restoration Project can be implemented in an attempt to offset cumulative impacts. However, sea level rise, a factor outside the control of the SBSP Restoration Project, needs to be taken into account in assessing the potential effects of the cumulative projects. The extent to which mudflat loss from sea level rise would adversely affect small shorebird numbers, and the extent to which adaptive management can offset adverse effects of mudflat loss due to sea level rise, are unknown. Therefore, although Alternative B's contribution to cumulative impacts to small shorebirds would be less than significant (as described in SBSP Impact 3.6-1), the cumulative impact of Alternative B plus the other tidal restoration projects and sea level rise is potentially significant.

Alternative B Level of Significance: Potentially Significant

Alternative C. Alternative C would result in greater conversion of pond habitat to tidal habitat than Alternative B, which would result in a greater reduction of high-tide foraging habitat for small shorebirds. Following an initial (20–30 years) increase in the availability of intertidal mudflat foraging area at low tide in the short term under Alternative C, intertidal mudflat is expected to decline in the long term due to conversion to emerging fringe marsh (through sedimentation) and conversion to subtidal habitat due to scour and sea level rise. As discussed for Alternative B above, the extent to which mudflat loss from scour and sea level rise would adversely affect small shorebird numbers, and the extent to which adaptive management can offset adverse effects of mudflat loss due to sea level rise, are unknown. Therefore, although Alternative C's contribution to cumulative impacts to small shorebirds would be less than

significant (as described in SBSP Impact 3.6-1), the cumulative impact of Alternative C in combination with other tidal restoration projects and sea level rise would be potentially significant.

Alternative C Level of Significance: Potentially Significant

Phase 1 No Action. As discussed for Alternative A, restoration of former salt ponds to tidal habitats as part of other cumulative projects on San Francisco Bay is expected to result in the loss of high-tide foraging habitat for small shorebirds. The effects of restoration projects in other parts of the Bay on high-tide foraging habitat are expected to be fairly minor, as the highest numbers of shorebirds using salt ponds in the Bay Area occur in the South Bay. In addition, other restoration projects and sea level rise are expected to result in the long-term loss of mudflat area. The extent to which mudflat loss would result in a decline in numbers of small shorebirds that forage primarily on mudflats is uncertain, for reasons discussed or Alternative A above. Nevertheless, 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 impact to small shorebird numbers in the South Bay.

The Phase 1 No Action would result in the loss of a small amount of high-tide foraging habitat in a few managed ponds due to unintentional breaching, and ultimately, development of vegetated tidal marsh in the breached pond would reduce any interim gain in mudflat foraging habitat that occurs after breaching. Although the contribution of the No Action Alternative within the Phase 1 ponds to cumulative impacts to foraging habitat for small shorebirds in the Bay Area (as described for Alternative A above) would be very minor, cumulatively, the impacts from other tidal restoration projects and sea level rise would reduce high-tide and low-tide shorebird foraging habitat. Under the No Action Alternative, no monitoring would be implemented to determine whether the changes in the SBSP Restoration Project Area result in declines in small shorebird numbers, and no adaptive management would be implemented to reverse such declines if they occur. Therefore, the cumulative impacts of the Phase 1 No Action and other cumulative projects, as well as sea level rise, would be potentially significant.

Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 Actions. As discussed for Alternative A, restoration of former salt ponds to tidal habitats as part of other cumulative projects on San Francisco Bay, as well as sea level rise, is expected to result in the loss of some high-tide foraging habitat for small shorebirds, and a loss of intertidal mudflat foraging habitat. The effects of those other projects on high-tide foraging habitat are expected to be fairly minor, as the highest numbers of shorebirds using salt ponds in the Bay Area occur in the South Bay. The extent to which mudflat loss would result in a decline in numbers of small shorebirds that forage primarily on mudflats is uncertain, for reasons discussed for Alternative A above. Nevertheless, 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 in the South Bay.

Under the proposed Phase 1 actions, the management of habitat within Ponds E12, E13, A16, and SF2 for small shorebirds, and possibly the management of other ponds specifically for these species, would more

than offset any long-term, adverse effects of the loss of managed pond habitat due to tidal restoration on small shorebirds as part of the Phase 1 actions. Therefore, the Phase 1 actions would not contribute significantly to (and instead would help ameliorate) cumulative impacts to foraging habitat for small shorebirds in the Bay Area (as described for Alternatives A, B, and C above). Nevertheless, the cumulative impacts of the Phase 1 actions and other cumulative projects and sea level rise would be potentially significant.

Phase 1 Actions Level of Significance: Potentially Significant

---

Cumulative Impact 3.6-2: **Loss of intertidal mudflats and reduction of habitat for mudflat-associated wildlife species.**

Alternative A. 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. 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 significant loss of mudflat area. As discussed in SBSP Impact 3.6-2 in Section 3.6, Biological Resources, South Bay populations of some mudflat-associated species (such as large shorebirds) may not be at or near the carrying capacity of the mudflats, and thus numbers may not track mudflat availability closely. 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.

Under Alternative A, approximately 4,500 acres would be restored to tidal action in an unplanned and uncontrolled manner. The impact of Alternative A would likely result in additional mudflat loss throughout the South Bay and San Francisco Bay (see SBSP Impact 3.3-2 in Section 3.3 and SBSP Impact 3.6-2 in Section 3.6).

Historically, the mudflats north of the Dumbarton Bridge have been subject to significant wave exposure and erosion (Jaffe and Foxgrover, 2006), and erosion of these mudflats is expected to continue with or without Project implementation. Sea level rise is another factor affecting mudflat area. As sea level rises, the area of shallow subtidal habitat increases at the expense of intertidal mudflats over relatively broad portions of the Bay. The amount of intertidal mudflat in the South Bay at Year 50 is projected to be reduced by 28 percent from the baseline of 12,400 acres under Alternative A (SBGA, Appendix I). Much of this mudflat loss occurs as a result of sea level rise, estimated at 0.5 ft over 50 years (IPCC 2001), as well as the colonization of existing mudflats by marsh vegetation. These mudflat loss estimates do not take into account the mudflat habitat that would be created within the tidally-restored areas along the numerous tidal channels that would develop within restored tidal habitats in unintentionally breached

ponds. However, these newly established mudflats would not offset the mudflat losses projected to occur in response to ongoing mudflat erosion and sea level rise. If accelerated sea level rise occurs (greater than 0.5 ft over 50 years), mudflat losses could be greater than projected in the SBGA.

Under Alternative A, no monitoring would be implemented to determine whether the changes in the SBSP Restoration Project Area result in mudflat loss or the degree to which mudflat loss results in changes in the abundance of mudflat-associated wildlife, and no adaptive management would be implemented to reverse such a decline if it were to occur. Therefore, the cumulative impacts of Alternative A, sea level rise and other cumulative tidal wetland restoration projects would be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As discussed under Alternative A, above, sea level rise and other tidal wetland restoration projects are expected to influence changes in mudflat habitat. Although the extent to which mudflat loss would result in a decline in mudflat-associated wildlife species is uncertain, as discussed under Alternative A, above, these tidal wetland restoration projects would result in a potentially significant impact. Sea level rise and continuing mudflat erosion in the South Bay would also affect mudflat area. The cumulative impacts associated with Alternative B and other wetland restoration projects would be similar to those described for Alternative A. Alternative B would restore approximately 7,500 acres to tidal action. Therefore the cumulative impact associated with Alternative B and other tidal wetland restoration projects would be potentially larger than that associated with Alternative A. Under Alternative B, the projected amount of intertidal mudflat in the South Bay at Year 50 is expected to be reduced by approximately 32 percent from the baseline (SBGA, Appendix I). As with Alternative A, these mudflat loss estimates do not take into account the mudflat habitat that would be created within the SBSP Restoration Project Area along the numerous tidal channels that would develop within the tidally-restored habitats, nor would they necessarily result in concomitant declines in abundance of mudflat-associated species if these species populations are not at the carrying capacity of the mudflats, or if mudflat productivity increases as a result of marsh restoration. However, these newly established mudflat habitats would not offset the losses projected to occur in response to sea level rise, on an acreage basis.

The Adaptive Management Plan would be used to monitor changes in the extent of mudflats and implement action in an attempt to ensure that mudflat declines from the SBSP Restoration Project do not reach a level of significance (see SBSP Impact 3.6-2 in Section 3.6, Biological Resources). Nevertheless, the cumulative impacts of Alternative B, sea level rise and other cumulative tidal wetland restoration projects would be potentially significant.

Alternative B Level of Significance: Potentially Significant

Alternative C. The cumulative impacts associated with Alternative C and other wetland restoration projects would be similar to those described for Alternative A. Alternative C restores approximately 13,500 acres to tidal action. Therefore the cumulative impact associated with Alternative C, other tidal wetland restoration projects, and sea level rise would be potentially larger than that associated with Alternatives A and B. Under Alternative C, the projected amount of intertidal mudflat in the South Bay at

Year 50 is expected to be reduced by 48 percent from the baseline (SBGA, Appendix I). The larger restored area under Alternative C would also result in a larger area of mudflat habitat created along the numerous tidal channels that would develop within the tidally-restored habitats, and potentially result in greater increases in mudflat productivity due to marsh restoration. However, these newly established mudflat habitats would not offset the losses projected to occur due to sea level rise and continuing mudflat erosion north of the Dumbarton Bridge on an acreage basis.

As with Alternative B, the Adaptive Management Plan would be used to monitor changes in the extent of mudflats and implement actions in an attempt to ensure that mudflat declines from the SBSP Restoration Project do not reach a level of significance (see SBSP Impact 3.6-2 in Section 3.6, Biological Resources). However, the cumulative impacts due to sea level rise and other tidal wetland restoration projects are likely beyond the scope of the adaptive management efforts to control. Therefore, the cumulative impacts of Alternative C, sea level rise and other tidal wetland restoration projects would be potentially significant.

Alternative C Level of Significance: Potentially Significant

Phase 1 No Action. As discussed for Alternative A above, other tidal wetland restoration projects are expected to influence changes in mudflat habitat in the vicinity of the pond complexes and would result in a potentially significant impact. In the South Bay, approximately 2,500 acres of tidal wetland restoration are either completed or proposed. Under Phase 1 No Action, approximately 1,220 acres would be restored to tidal action in an unplanned and uncontrolled manner, including 860 acres in the Eden Landing pond complex (Ponds E8A, E8X, E9, E12 and E13) and 360 acres in the Alviso pond complexes (Pond A6). As a result of these tidal conversions, approximately 1,010 additional acres would likely convert to tidal action, including 150 acres (Pond E14) in the Eden Landing pond complex, and 860 acres (Ponds A5 and A7) in the Alviso pond complex. Combined with the 2,500 acres of other completed or planned wetland restoration projects in the South Bay, this would result in a cumulative combined total restoration of over 4,730 acres. Although this was not explicitly analyzed in the SBGA (Appendix I), this total is comparable to the restored acreage considered for Alternative A. Therefore, the incremental effect associated with the Phase 1 No Action in combination with the other cumulative projects and sea level rise would lead to significant declines in the area of mudflat habitat. As described above for Alternative A, the extent to which a decline in mudflat area would result in a decline in the abundance of mudflat-associated wildlife species is unknown. However, this mudflat loss would be a potentially significant cumulative impact due to the importance of South Bay mudflats to invertebrates, waterbirds, and fish.

Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 Actions. As discussed for Alternative A above, other tidal wetland restoration projects are expected to influence changes in mudflat habitat in the vicinity of the pond complexes and would result in a potentially significant impact. Implementation of the Phase 1 actions would result in approximately 990 acres of tidal restoration, including approximately 630 acres (Ponds E8A, E8X and E9) in the Eden Landing pond complex, and approximately 360 acres (Pond A6) in the Alviso pond complex. Although the impact of these restoration efforts alone would not likely result in significant mudflat loss within the South Bay, the cumulative impacts associated with the Phase 1 actions and the 2,500 acres of other

planned and proposed projects in the South Bay, would result in a potentially significant impact. Sea level rise would be the major factor influencing mudflat loss throughout the South Bay. The cumulative impacts of other tidal wetland restoration projects, sea level rise, and the Phase 1 actions would be similar to, but smaller than, those described for the Phase 1 No Action cumulative impact and would be potentially significant.

Phase 1 Actions Level of Significance: Potentially Significant

---

***Cumulative Impact 3.6-3*: Potential habitat conversion impacts to western snowy plovers.**

Alternative A. Because virtually all of the western snowy plovers breeding in San Francisco Bay breed in managed ponds (including salt ponds) in the South Bay, the only projects considered in the cumulative impact analysis for this species are those projects that could result in the modification of these ponds, or that could contribute to changes in western snowy plover numbers through other means (*e.g.*, by supporting populations of plover predators). Currently, there are no plans for modification of habitat in other locations where western snowy plovers breed, or potentially could breed, such as Cargill Inc. (Cargill)-controlled salt ponds, Hayward Regional Shoreline, or portions of the ELER outside of the SBSP Restoration Project Area.

Landfills around the South Bay support populations of potential western snowy plover predators, such as gulls and corvids; gulls may also compete with western snowy plovers for nesting habitat. The Tri-Cities Landfill in Fremont will stop accepting waste in 2007, thus eliminating what has been an important source of food for plover predators. Although other landfills in the South Bay will continue operation, no new landfills that would result in increases in predators of western snowy plovers, or any other new projects expected to result in increases in gulls or corvids, are known at this time.

Under the No Action Alternative, potential breeding and foraging habitat for western snowy plovers would be lost as a result of uncontrolled levee breaching, which would eventually flood some ponds that currently provide shallow foraging habitat. As a result, the No Action Alternative is expected to result in declines in the number of breeding western snowy plovers in San Francisco Bay. Alternative A's contribution to this cumulative impact would be potentially significant.

Because no projects in the South Bay involving modification of existing western snowy plover nesting habitat or augmentation of populations of important western snowy plover predators are known at this time, the assessment of cumulative impacts to western snowy plovers is driven by the impact assessment for the SBSP Restoration Project, as discussed for SBSP Impact 3.6-3. The cumulative impacts of Alternative A and the other cumulative projects would be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As discussed for Alternative A above, other cumulative projects are not expected to affect existing western snowy plover habitat, and thus the assessment of cumulative impacts to western snowy

plovers is driven by the impact assessment for the SBSP Restoration Project. This impact is less than significant for reasons discussed for SBSP Impact 3.6-3, and thus, under Alternative B no significant impacts to western snowy plovers are expected. Therefore, the cumulative impacts of Alternative B and the other cumulative projects would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. As discussed for Alternative A above, other cumulative projects are not expected to affect existing western snowy plover habitat, and thus the assessment of cumulative impacts to western snowy plovers is driven by the impact assessment for the SBSP Restoration Project. This impact is less than significant for reasons discussed for SBSP Impact 3.6-3, and thus, under Alternative C no significant impacts to western snowy plovers are expected. Therefore, the cumulative impacts of Alternative C and the other cumulative projects would be less than significant.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. As discussed under Alternative A, above, other cumulative projects are not expected to affect existing western snowy plover habitat, and thus the assessment of cumulative impacts to western snowy plovers is driven by the impact assessment for the SBSP Restoration Project. This impact is potentially significant for reasons discussed for Phase 1 Impact 3.6-3, and thus, the Phase 1 No Action could potentially result in significant impacts to western snowy plovers. Therefore, the cumulative impacts of the Phase 1 No Action and the other cumulative projects would be potentially significant.

Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 Actions. As discussed under Alternative A, above, other cumulative projects are not expected to affect existing western snowy plover habitat, and thus the assessment of cumulative impacts to western snowy plovers is driven by the impact assessment for the SBSP Restoration Project. This impact is less than significant for reasons discussed for Phase 1 Impact 3.6-3, and thus, the Phase 1 actions are not expected to result in significant impacts to western snowy plovers. Therefore, the cumulative impacts of the Phase 1 actions and the other cumulative projects would be less than significant.

Phase 1 Actions Level of Significance: Less than Significant

Cumulative Impact 3.6-4: **Potential reduction in the numbers of breeding, pond-associated waterbirds (avocets, stilts, and terns) using the South Bay due to reduction in habitat, concentration effects, displacement by nesting California gulls, and other Project-related effects.**

Alternative A. Other (*i.e.*, non-SBSP Restoration Project) tidal restoration efforts underway or proposed in San Francisco Bay may reduce the availability of nesting habitat for pond-associated waterbirds to some degree. However, with the exception of Caspian terns, for which Brooks Island in the North Bay supports the largest Bay Area colony, the majority of the avocets, stilts, and Forster's terns that breed in the Bay Area nest in the South Bay. As a result, the cumulative projects that contribute most to

cumulative impacts for these species are those projects that could result in the modification of South Bay nesting habitat, or that could contribute to changes in numbers of these species in the South Bay through other means (*e.g.*, by supporting populations of predators and competitors).

Although large numbers of Caspian terns formerly nested at Bair Island, only small numbers of black-necked stilts and American avocets currently breed at this location, and thus tidal restoration at Bair Island is not expected to affect substantial numbers of breeding pond-associated birds. Currently, there are no plans for modification of habitat in other locations where substantial numbers of these species breed.

Landfills around the South Bay support populations of potential predators of stilts, avocets, and terns, such as gulls and corvids; gulls also compete with these birds for nest sites. The Tri-Cities Landfill in Fremont will stop accepting waste in 2007, thus eliminating what has been an important source of food for gulls and corvids. Although other landfills in the South Bay will continue operation, no new landfills that would result in increases in these predatory species, or any other new projects expected to result in increases in gulls or corvids, are known at this time. Therefore, the contribution of other tidal restoration projects to this cumulative impact would be less than significant.

Under the No Action Alternative, potential breeding and foraging habitat for avocets, stilts, and terns would be lost as a result of unintentional levee breaching and the resulting development of vegetated marsh in some ponds, as well as development of vegetated, non-tidal, seasonal wetlands in some other ponds. Given the considerable inter-annual fluctuation in breeding abundance and distribution of terns, stilts and avocets in the South Bay, and the uncertainty related to the effect of displacement of California gull colonies on these birds, it is difficult to predict the magnitude of the impacts of the No Action Alternative on these pond-associated breeding birds. Nevertheless, given the importance of the Eden Landing pond complex to stilt and avocet numbers in the South Bay (Rintoul and others 2003) and the extent of potential pond habitat loss in that pond complex under the No Action Alternative, as well as the expected increases in predation pressure under this alternative, it is possible that population declines could be substantial. Therefore, Alternative A's contribution to the cumulative impact would be potentially significant.

Because no projects in the Bay Area involving modification of existing nesting habitat used by large numbers of stilts, avocets, or terns, or augmentation of populations of important predators such as gulls or corvids, are known at this time, the assessment of cumulative impacts to breeding pond-associated birds is driven primarily by the impact assessment for the SBSP Restoration Project, as discussed for SBSP Impact 3.6-4. Therefore, the cumulative impacts of Alternative A and the other cumulative projects would be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As discussed under Alternative A, above, other cumulative projects are not expected to affect existing habitat used by large numbers of stilts, avocets or terns, or increase populations of important predators such as gulls or corvids. Therefore, the assessment of cumulative impacts to breeding pond-associated birds is driven primarily by the impact assessment for the SBSP Restoration Project.

This impact is less than significant for reasons discussed for SBSP Impact 3.6-4, and thus under Alternative B, no significant impacts to these species are expected. Therefore, the cumulative impacts of Alternative B and the other cumulative projects would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. As discussed under Alternative A, above, other cumulative projects are not expected to affect existing habitat used by large numbers of stilts, avocets or terns, or increase populations of important predators such as gulls or corvids. Therefore, the assessment of cumulative impacts to breeding pond-associated birds is driven primarily by the impact assessment for the SBSP Restoration Project. This impact is less than significant for reasons discussed for SBSP Impact 3.6-4, and thus under Alternative C, no significant impacts to these species are expected. Therefore, the cumulative impacts of Alternative C and the other cumulative projects would be less than significant.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. As discussed under Alternative A, above, other cumulative projects are not expected to affect existing habitat used by large numbers of stilts, avocets or terns, or increase populations of important predators such as gulls or corvids. Therefore, the assessment of cumulative impacts to breeding pond-associated birds is driven primarily by the impact assessment for the SBSP Restoration Project. This impact is potentially significant for reasons discussed for Phase 1 Impact 3.6-4, and thus the Phase 1 No Action could result in potentially significant cumulative impacts to these species. Therefore, the cumulative impacts of the Phase 1 No Action and the other cumulative projects would be potentially significant.

Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 Actions. As discussed under Alternative A, above, other cumulative projects are not expected to affect existing habitat used by large numbers of stilts, avocets or terns, or increase populations of important predators such as gulls or corvids. Therefore, the assessment of cumulative impacts to breeding pond-associated birds is driven primarily by the impact assessment for the SBSP Restoration Project. This impact is less than significant for reasons discussed for Phase 1 Impact 3.6-4, and thus the Phase 1 actions are not expected to result in significant impacts to these species. Therefore, the cumulative impacts of the Phase 1 actions and the other cumulative projects would be less than significant.

Phase 1 Actions Level of Significance: Less than Significant

Cumulative Impact 3.6-5: **Potential reduction in the numbers of non-breeding, salt pond-associated birds (*e.g.*, phalaropes, eared grebes, and Bonaparte's gulls) as a result of habitat loss.**

Alternative A. Other (*i.e.*, non-SBSP Restoration Project) tidal restoration efforts underway or proposed in San Francisco Bay may reduce the availability of foraging habitat for salt pond-specialist waterbirds. However, most high-salinity salt ponds outside of the SBSP Restoration Project Area in the Bay Area

have either already been restored (*e.g.*, the Napa salt ponds) or are presumed to continue to be operated as they are currently (*e.g.*, Cargill-operated salt ponds), thus continuing to provide habitat for salt pond-specialist waterbirds. As a result, it is assumed that effects of other cumulative projects in the Bay Area, other than the SBSP Restoration Project, on salt pond-specialist waterbirds would be less than significant.

Under the No Action Alternative, high-salinity pond habitat for salt pond-specialist waterbirds is expected to decline considerably in the South Bay, relative to existing conditions. It is expected that most of the SBSP Restoration Project-area ponds that do not become tidal due to unintentional breaching, or that are not converted to seasonal wetlands (which would likely become largely vegetated) would be managed as lower-salinity ponds to facilitate meeting discharge requirements. As a result, it is possible that no ponds would be managed specifically as high-salinity ponds under the No Action Alternative. Although the magnitude of Alternative A's impact on salt pond-specialist species is highly uncertain, as managers may elect to manage some ponds specifically as high-salinity ponds, there is some potential for the No Action Alternative to result in substantial declines in numbers of salt pond-specialist waterbirds in the SBSP Restoration Project Area. Under the No Action Alternative, no monitoring would be implemented to determine whether the changes in the SBSP Restoration Project Area are resulting in substantial declines, and no adaptive management would be implemented to reverse such declines if they occur. Therefore, Alternative A's contribution to the cumulative impact would be potentially significant.

Because the assessment of cumulative impacts to breeding pond-associated birds is driven primarily by the impact assessment for the SBSP Restoration Project, as discussed for SBSP Impact 3.6-5. Therefore, the cumulative impacts of Alternative A and the other cumulative projects would be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. Under Alternative B, high-salinity pond habitat for salt pond-specialist waterbirds would decline by approximately 55 percent in the SBSP Restoration Project Area. Because existing numbers of salt pond-specialist species in the SBSP Restoration Project Area are currently so low, and some managed pond habitat would be managed specifically for higher-salinity conditions for these birds, declines under Alternative B may not be substantial.

As described above for Alternative A, the effects of other cumulative projects in the Bay Area on salt pond-specialist waterbirds would be less than significant. Therefore, the assessment of cumulative impacts to salt pond-specialist waterbirds is driven primarily by the impact assessment for the SBSP Restoration Project, as discussed for SBSP Impact 3.6-5. Under Alternative B, an Adaptive Management Plan would be used to monitor changes in abundance to determine actual responses of salt pond-specialist waterbird populations to SBSP Restoration Project activities with the goal of ensuring that declines are not substantial. Monitoring of salt ponds in the South Bay, informed by monitoring of shorebird numbers at other locations (including other high-salinity pond habitats) in the Bay Area, would indicate whether cumulative impacts of habitat restoration projects in the Bay Area on salt pond-specialist waterbirds are approaching significant levels. If such changes are detected, and are linked to loss of foraging habitat (rather than occurring due to larger-scale processes such as climate change), then measures could be implemented to halt or reverse the trend, including additional management of remaining ponds for high-

salinity conditions, and possibly halting the conversion of additional ponds to tidal habitats. Thus, under Alternative B, impacts to salt pond-specialist waterbirds are expected to be less than significant. Therefore, the cumulative impacts of Alternative B and the other cumulative projects would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. As described above for Alternative A, the effects of other cumulative projects in the Bay Area on salt pond-specialist waterbirds would be less than significant. Under Alternative C, potential foraging habitat for salt pond-specialist waterbirds would decline by approximately 87 percent in the SBSP Restoration Project Area. Because existing numbers of salt pond-specialist species in the SBSP Restoration Project Area are currently so low, and some managed pond habitat would be managed specifically for higher-salinity conditions for these birds, declines under Alternative C may not be substantial. As described above under Alternative B, an Adaptive Management Plan would be used to monitor changes in abundance to determine actual responses of salt pond-associated waterbird populations to SBSP Restoration Project activities with the goal of ensuring that declines are not substantial. Thus, under Alternative C, impacts to salt pond-specialist waterbirds are expected to be less than significant. Therefore, the cumulative impacts of Alternative C and the other cumulative projects would be less than significant.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. As described above for Alternative A, the effects of other cumulative projects in the Bay Area on salt pond-specialist waterbirds would be less than significant. The Phase 1 No Action would result in the loss of a relatively small amount of high-salinity foraging habitat for salt pond-specialist waterbirds due to unintentional breaching. However, the ponds that may be converted to tidal habitats due to such breaching are currently used by relatively few salt pond-specialist species, as described under Phase 1 Impact 3.6-5. Because the assessment of cumulative impacts to salt pond-specialist waterbirds is driven primarily by the impact assessment for the SBSP Restoration Project, the Phase 1 No Action is thus not expected to result in significant impacts to these species. Therefore, the cumulative impacts of the Phase 1 No Action and the other cumulative projects would be less than significant.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. As described above for Alternative A, the effects of other cumulative projects in the Bay Area on salt pond-specialist waterbirds would be less than significant. The effects of the Phase 1 actions on salt pond-specialist birds are likely to be negligible, as adverse effects from the loss of habitat in Ponds E8A, E8X, and E9 (which are currently used by only low numbers of these birds) are expected to be offset by enhancement of habitat in Ponds E12, E13, and SF2, and changes in conditions in the Alviso pond complex due to Phase 1 actions are not expected to result in substantial changes in the abundance of salt pond-specialist birds. Because the assessment of cumulative impacts to salt pond-specialist waterbirds is driven primarily by the impact assessment for the SBSP Restoration Project, and the effects of the Phase 1 actions would be less than significant, the cumulative impacts of the Phase 1 actions and other cumulative projects would be less than significant.

Phase 1 Actions Level of Significance: Less than Significant

Cumulative Impact 3.6-6: **Potential reduction in foraging habitat for diving ducks, resulting in declines in flyway-level populations.**

Alternative A. Other (*i.e.*, non-SBSP Restoration Project) tidal restoration efforts in San Francisco Bay that would result in the conversion of open, deep-water diving duck foraging habitat to vegetated tidal marsh would reduce the extent of diving duck foraging habitat, while tidal restoration projects that convert diked agricultural, grassland, or shallow wetland habitat to tidal marsh may increase diving duck habitat through the restoration of tidal sloughs. Outside the SBSP Restoration Project Area, most tidal restoration projects that are currently proposed involve restoration of tidal action to diked seasonal wetlands, agricultural land, or other areas with little or no deep-water diving duck foraging habitat. Therefore, other cumulative projects, excluding Alternative A, are expected to result in less-than-significant impacts to diving ducks, and the assessment of cumulative impacts to diving ducks is driven primarily by the impact assessment for the SBSP Restoration Project, as discussed for SBSP Impact 3.6-6. Whether the net effect of all projects affecting diving duck habitat in the Bay Area is positive, negative, or neutral depends not only on the balance between habitat loss and gain through tidal restoration projects, but also on whether diving duck foraging habitat in the Bay Area is limiting local numbers. Given the extensive nature of foraging habitat within the Bay itself, it is possible that local numbers are regulated by other factors (*e.g.*, in breeding areas), and that Bay Area habitats are not at carrying capacity. Nevertheless, it is at least possible that the cumulative restoration of tidal habitats in managed ponds in the Bay Area could result in substantial declines in numbers of diving ducks in the region.

Under the No Action Alternative, potential foraging habitat for diving ducks would decline by approximately 67 percent in South Bay salt ponds. Habitat conditions in open water habitat in the South Bay are expected to change negligibly, resulting in a net decrease in potential foraging habitat for diving ducks of three percent. Habitat change in salt ponds could therefore lead to a substantial decrease in diving duck numbers in the South Bay. Alternative A's contribution to this cumulative impact would be potentially significant.

Under the No Action Alternative, no monitoring would be implemented to determine whether the changes in the SBSP Restoration Project Area are resulting in such substantial declines, and no adaptive management would be implemented to reverse such declines if they occur. Therefore, the cumulative impacts of Alternative A and the other cumulative projects would be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As discussed under Alternative A, above, most tidal restoration projects outside the SBSP Restoration Project Area that are currently proposed involve restoration of tidal action to diked seasonal wetlands, agricultural land, or other areas with little or no deep-water diving duck foraging habitat. Therefore, other cumulative projects, excluding Alternative B, are expected to result in less-than-

significant impacts to diving ducks, and the assessment of cumulative impacts to diving ducks is driven primarily by the impact assessment for the SBSP Restoration Project, as discussed for SBSP Impact 3.6-6.

Under Alternative B, potential foraging habitat for diving ducks would decline by approximately 20 percent in South Bay salt ponds. Habitat conditions in open water habitat in the South Bay are expected to change negligibly, resulting in a net decrease in potential foraging habitat for diving ducks of less than one percent. Habitat change in the salt ponds could lead to a decrease in diving duck numbers in the South Bay.

However, under Alternative B, the Adaptive Management Plan would be used to monitor changes in regional abundance of diving ducks to determine actual responses of diving duck populations to SBSP Restoration Project activities, and potentially the effects of other restoration projects, so that actions can be taken to ensure that substantial declines do not occur as a result of this Project. An example of an adaptive management action would be to increase the water depth within the managed ponds to provide more deep-water habitat for diving ducks. Thus, Alternative B's contribution to cumulative impacts on diving ducks would be less than significant. Therefore, the cumulative impacts of Alternative B and the other cumulative projects would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. As discussed under Alternative A, above, most tidal restoration projects outside the SBSP Restoration Project Area that are currently proposed involve restoration of tidal action to diked seasonal wetlands, agricultural land, or other areas with little or no deep-water diving duck foraging habitat. Therefore, other cumulative projects, excluding Alternative C, are expected to result in less-than-significant impacts to diving ducks, and the assessment of cumulative impacts to diving ducks is driven primarily by the impact assessment for the SBSP Restoration Project, as discussed for SBSP Impact 3.6-6.

Under Alternative C, potential foraging habitat for diving ducks would decline by approximately 86 percent in South Bay salt ponds. However, as discussed under Alternative B above, the Adaptive Management Plan would be used to monitor changes in abundance so that substantial declines do not occur as a result of the SBSP Restoration Project, and thus, under Alternative C, impacts to diving ducks are expected to be less than significant. Therefore, the cumulative impacts of Alternative C and the other cumulative projects would be less than significant.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. As discussed under Alternative A, above, most tidal restoration projects outside the SBSP Restoration Project Area that are currently proposed involve restoration of tidal action to diked seasonal wetlands, agricultural land, or other areas with little or no deep-water diving duck foraging habitat. Therefore, other cumulative projects, excluding Alternative B, are expected to result in less-than-significant impacts to diving ducks, and the assessment of cumulative impacts to diving ducks is driven

primarily by the impact assessment for the SBSP Restoration Project, as discussed for SBSP Impact 3.6-6.

Relatively few diving ducks forage in the Phase 1 ponds that could potentially be converted to tidal habitats due to unintentional breaching under the Phase 1 No Action, and no other outcomes of the Phase 1 No Action are expected to result in substantial adverse effects on diving ducks. Because the assessment of cumulative impacts to diving ducks is driven primarily by the impact assessment for the SBSP Restoration Project, the Phase 1 No Action is not expected to result in significant impacts to diving ducks. Therefore, the cumulative impacts of the Phase 1 No Action and the other cumulative projects would be less than significant.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. As discussed under Alternative A, above, most tidal restoration projects outside the SBSP Restoration Project Area that are currently proposed involve restoration of tidal action to diked seasonal wetlands, agricultural land, or other areas with little or no deep-water diving duck foraging habitat. Therefore, other cumulative projects, excluding Alternative B, are expected to result in less-than-significant impacts to diving ducks, and the assessment of cumulative impacts to diving ducks is driven primarily by the impact assessment for the SBSP Restoration Project, as discussed for SBSP Impact 3.6-6.

The increase in diving duck foraging habitat that would occur in the Alviso pond complex as a result of Phase 1 actions (particularly the deepening of Ponds A5, A7, and A8) is expected to more than offset any reduction in habitat that occurs at the Eden Landing pond complex, where use of Phase 1 ponds by diving ducks is currently low, due to ongoing tidal habitat restoration resulting from other cumulative projects. Because the assessment of cumulative impacts to diving ducks is driven primarily by the impact assessment for the SBSP Restoration Project, the Phase 1 actions are not expected to result in significant impacts to diving ducks. Therefore, the cumulative impacts of the Phase 1 actions and the other cumulative projects would be less than significant.

Phase 1 Actions Level of Significance: Less than Significant

Cumulative Impact 3.6-7: **Reduction in foraging habitat for ruddy ducks, resulting in declines in flyway-level populations.**

Alternative A. Other (*i.e.*, non-SBSP Restoration Project) tidal restoration efforts underway or proposed in San Francisco Bay may reduce the availability of foraging habitat for ruddy ducks. However, most salt ponds outside of the SBSP Restoration Project Area in the Bay Area have either already been restored (*e.g.*, the Napa salt ponds) or are presumed to continue to be operated as they are currently (*e.g.*, Cargill-operated salt ponds), thus continuing to provide habitat for this species. As a result, it is assumed that impacts of other cumulative projects in the Bay Area, other than the SBSP Restoration Project, on ruddy ducks would be less than significant.

Under the No Action Alternative, potential foraging habitat for ruddy ducks would decline by approximately 67 percent in South Bay salt ponds. Because this species is unlikely to shift habitat use to tidal waters (as may occur with other diving ducks), substantial impacts to numbers of this species in the South Bay are likely. Therefore, Alternative A's contribution to this cumulative impact would be potentially significant.

The assessment of cumulative impacts to ruddy ducks is driven primarily by the impact assessment for the SBSP Restoration Project, as discussed for SBSP Impact 3.6-7. Therefore, the cumulative impacts of Alternative A and the other cumulative projects would be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As discussed for Alternative A above, impacts of other cumulative projects in the Bay Area, other than the SBSP Restoration Project, on ruddy ducks would be less than significant. Under Alternative B, potential foraging habitat for ruddy ducks would decline by approximately 20 percent in South Bay salt ponds, potentially resulting in substantial declines in the South Bay. Alternative B's contribution to this cumulative impact would be potentially significant.

As discussed under Alternative A, above, the assessment of cumulative impacts to ruddy ducks is driven primarily by the impact assessment for the SBSP Restoration Project (which was addressed in detail under SBSP Impact 3.6-7). Therefore, the cumulative impacts of Alternative B and the other cumulative projects would be potentially significant.

Alternative B Level of Significance: Potentially Significant

Alternative C. As discussed for Alternative A above, impacts of other cumulative projects in the Bay Area, other than the SBSP Restoration Project, on ruddy ducks would be less than significant. Under Alternative C, potential foraging habitat for ruddy ducks would decline by approximately 86 percent in South Bay salt ponds, likely resulting in substantial declines in the South Bay. Alternative C's contribution to this cumulative impact would be potentially significant.

As discussed under Alternative A, above, the assessment of cumulative impacts to ruddy ducks is driven primarily by the impact assessment for the SBSP Restoration Project (which was addressed in detail under SBSP Impact 3.6-7). Therefore, the cumulative impacts of Alternative C and the other cumulative projects would be potentially significant.

Alternative C Level of Significance: Potentially Significant

Phase 1 No Action. As discussed for Alternative A above, impacts of other cumulative projects in the Bay Area, other than the SBSP Restoration Project, on ruddy ducks would be less than significant. Relatively few ruddy ducks forage in the Phase 1 ponds that could potentially be converted to tidal habitats due to unintentional breaching under the Phase 1 No Action, and no other outcomes of the Phase 1 No Action are expected to result in substantial adverse effects on ruddy ducks. Therefore, the Phase 1 No Action's contribution to cumulative impacts on ruddy ducks would be less than significant. The

cumulative impacts of the Phase 1 No Action and the other cumulative projects would be less than significant.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. As discussed for Alternative A above, impacts of other cumulative projects in the Bay Area, other than the SBSP Restoration Project, on ruddy ducks would be less than significant. Therefore, the assessment of cumulative impacts to ruddy ducks is driven primarily by the impact assessment for the SBSP Phase 1 actions (which was addressed in detail under Phase 1 Impact 3.6-7).

The increase in ruddy duck numbers expected to occur due to the increase in deep-water habitat in Pond A8 in Phase 1 may outweigh declines expected in Pond A16. Phase 1 actions would likely have relatively little effect on ruddy duck numbers in other Phase 1 ponds, and overall, there would likely be little effect on, and possibly a slight increase in, ruddy duck numbers. The Phase 1 actions' contribution to cumulative impacts on ruddy ducks would be less than significant. Consequently, the cumulative impacts of the Phase 1 actions and the other cumulative projects would be less than significant.

Phase 1 Actions Level of Significance: Less than Significant

Cumulative Impact 3.6-8: **Potential habitat conversion impacts on California least terns.**

Alternative A. Most of other (*i.e.*, non-SBSP Restoration Project) tidal restoration projects elsewhere within the Bay Area that are currently proposed involve restoration of tidal action to diked seasonal wetlands, agricultural land, or other areas with little or no deep-water foraging habitat for least terns. Those restoration projects that involve conversion of managed pond to tidal habitats would result in a decline in potential managed pond foraging habitat for California least terns and an increase in potential foraging habitat within tidal waters. However, ample foraging and roosting habitat for California least terns is present in the Bay Area, including the Central Bay, where most foraging occurs during the nesting period, and the South Bay, where the majority of foraging and roosting occurs during the postbreeding staging period. Given the extent of potential foraging habitat and the low Bay Area population of this species, cumulative projects are not expected to result in a decline in foraging habitat to the point that Bay Area populations are adversely affected. The contribution of other cumulative projects to cumulative impacts on California least terns would be less than significant.

The No Action Alternative would result in similar conversions from managed pond to tidal habitats, either of which could be used by California least terns. It is possible that tidal habitat restoration could result in increases in fish populations to levels that benefit California least terns in the Bay Area. Therefore, Alternative A's contribution to cumulative impacts on California least terns would be less than significant. The cumulative impacts of Alternative A and the other cumulative projects would be less than significant.

Alternative A Level of Significance: Less than Significant

Alternative B. As discussed for Alternative A above, the contribution of other cumulative projects to cumulative impacts on California least terns would be less than significant. Under Alternative B, potential foraging habitat for California least terns within South Bay salt ponds would decline in some areas, such as at Eden Landing, but the primary ponds used for post-breeding foraging north of Moffett Federal Airfield would be retained as managed ponds. These ponds would likely provide foraging and roosting habitat similar to current conditions. Overall, managed pond foraging habitat for California least terns would decline under this alternative, while subtidal foraging habitat, and fish populations, are expected to increase due to tidal restoration. Alternative B's contribution to cumulative impacts on California least terns would be less than significant.

As discussed under Alternative A, above, it is possible that tidal habitat restoration could result in increases in fish populations to levels that benefit California least terns in the Bay Area. Therefore, the cumulative impacts of Alternative B and the other cumulative projects would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. As discussed for Alternative A above, the contribution of other cumulative projects to cumulative impacts on California least terns would be less than significant. Under Alternative C, extensive tidal restoration would result in a decline in potential foraging habitat for California least terns within South Bay salt ponds and an increase in potential foraging habitat within tidal waters. Alternative C's contribution to cumulative impacts on California least terns would be less than significant.

As discussed under Alternative A, above, it is possible that tidal habitat restoration could result in increases in fish populations to levels that benefit California least terns in the Bay Area. Therefore, the cumulative impacts of Alternative C and the other cumulative projects would be less than significant.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. As discussed for Alternative A above, the contribution of other cumulative projects to cumulative impacts on California least terns would be less than significant. Any reduction in managed pond foraging habitat that would occur under the Phase 1 No Action is not expected to result in declines in Bay Area California least tern numbers, as tidal foraging habitat would increase due to unintentional breaching in some ponds, and there is ample alternative foraging and roosting habitat elsewhere in the South Bay. Consequently, the Phase 1 No Action's contribution to cumulative impacts on California least terns would be less than significant.

As discussed under Alternative A, above, it is possible that tidal habitat restoration could result in increases in fish populations to levels that benefit California least terns in the Bay Area. Therefore, the cumulative impacts of the Phase 1 No Action and the other cumulative projects would be less than significant.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. As discussed for Alternative A above, the contribution of other cumulative projects to cumulative impacts on California least terns would be less than significant. Phase 1 actions are expected to result in a slight increase in potential foraging habitat for California least terns, primarily as a result of deeper-water conditions in Ponds A5, A7, and A8 (areas near the species' primary South Bay staging area). Consequently, the Phase 1 actions' contribution to cumulative impacts on California least terns would be less than significant.

As discussed under Alternative A, above, it is possible that tidal habitat restoration could result in increases in fish populations to levels that benefit California least terns in the Bay Area. Therefore, the cumulative impacts of the Phase 1 actions and the other cumulative projects would be less than significant.

Phase 1 Actions Level of Significance: Less than Significant

Cumulative Impact 3.6-9: **Potential loss of pickleweed-dominated tidal salt marsh habitat for the salt marsh harvest mouse and salt marsh wandering shrew, and further isolation of these species' populations, due to breaching activities and scour.**

Alternative A. There are numerous tidal restoration projects planned, or currently underway, in San Francisco Bay. These projects result in direct alteration of habitats (*e.g.*, levee breaching) that affect levees and small amounts of tidal marsh. Additionally, tidal marsh restoration would re-create larger tidal prisms within existing channels, which is expected to result in an increased level of erosion of existing tidal marshes. In the long term, there would be an overwhelmingly positive impact to tidal marsh-associated species from tidal restoration, as many thousands of acres of new marsh would be created, albeit over an extended time period. Relatively very little pickleweed-dominated tidal salt marsh habitat would be directly or indirectly affected, and such effects are expected to be short-term (less than 10 years) effects. In the long term, tidal restoration is expected to result in substantial increases in habitat connectivity via marsh establishment.

For marsh-associated species such as the salt marsh harvest mouse, salt marsh wandering shrew, and California clapper rail, the other cumulative projects in San Francisco Bay are expected to result in considerable increases in habitat in the long term, thereby augmenting populations far beyond the minor, local impacts that may occur during construction. The contribution of other cumulative projects to cumulative impacts on marsh habitat would be less than significant/beneficial.

Under the No Action Alternative, small losses of pickleweed-dominated tidal marsh would occur at a number of locations throughout the SBSP Restoration Project Area due to erosion and scour from uncontrolled breaching. Because such breaches would be unintentional, the locations and extent of habitat loss would not be controlled, and thus salt marsh harvest mouse and wandering shrew dispersal in any given area may be adversely affected. However, in the long term, uncontrolled breaching of levees would ultimately result in substantial increases in tidal marsh habitat, a significant beneficial effect for tidal marsh-associated wildlife. This increase in habitat would offset any minor short-term impacts to

pickleweed dominated tidal marsh and the dispersal or habitat of marsh-associated species. Alternative A's contribution cumulative impacts on marsh habitat would be less than significant/beneficial.

Therefore, the cumulative impacts of Alternative A and the other cumulative projects would be less than significant/beneficial.

Alternative A Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Alternative B. As discussed for Alternative A above, the contribution of other cumulative projects to cumulative impacts on marsh habitat would be less than significant/beneficial. Under Alternative B, small losses of pickleweed-dominated tidal marsh would occur at a number of locations throughout the Project Area. As discussed in SBSP Impact 3.6-9 in Section 3.6, Biological Resources, Alternative B would also increase tidal marsh habitat over the long term. Alternative B's contribution to cumulative impacts on marsh habitat would be less than significant/beneficial. Therefore, the cumulative impacts of Alternative B and the other cumulative projects would be less than significant/beneficial.

Alternative B Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Alternative C. Cumulative impacts would be the same as those described under Alternative B.

Alternative C Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Phase 1 No Action. Cumulative impacts would be the same as those described under Alternative A.

Phase 1 No Action Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Phase 1 Actions. Cumulative impacts would be the same as those described under Alternative B.

Phase 1 Actions Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Cumulative Impact 3.6-10: **Potential construction-related loss of or disturbance to special-status, marsh-associated wildlife.**

Alternative A. Other (*i.e.*, non-SBSP Restoration Project) tidal restoration projects recently completed, planned, or currently underway in San Francisco Bay may have limited, short-term effects on marsh-associated wildlife during construction. The contribution of other cumulative projects to cumulative impacts on special-status, marsh-associated wildlife would be less than significant.

Under the No Action Alternative, no construction-related impacts would occur. Alternative A would not contribute any adverse impacts, and cumulative impacts associated with the implementation of Alternative A and other cumulative projects would be less than significant.

Alternative A Level of Significance: Less than Significant

Alternative B. As discussed for Alternative A above, the contribution of other cumulative projects to cumulative impacts on special-status, marsh-associated wildlife would be less than significant. Under Alternative B, construction would occur at a number of locations throughout the SBSP Restoration Project Area. However, with implementation of measures to avoid and minimize impacts (*i.e.*, seasonal avoidance and pre-construction surveys), impacts on marsh-associated species are expected to be less than significant. Cumulatively, however, the SBSP Restoration Project and these other restoration projects would result in considerable increases in tidal marsh habitat in the long term, thereby augmenting populations of tidal marsh-associated species far beyond the minor, local impacts that may occur during construction. Therefore, the cumulative impacts of Alternative B and the other cumulative projects would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. Cumulative impacts would be the same as those described under Alternative B.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. Under the No Action Alternative, no construction-related impacts would occur.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. Cumulative impacts would be the same as those described under Alternative B.

Phase 1 Actions Level of Significance: Less than Significant

Cumulative Impact 3.6-11: **Potential construction-related loss of, or disturbance to, nesting pond-associated birds.**

Alternative A. As discussed above under Cumulative Impact 3.6-4, the assessment of cumulative impacts to breeding pond-associated birds is driven primarily by the impact assessment for the SBSP Restoration Project, since relatively low numbers of these species breed in other parts of the Bay Area that could be affected by other cumulative projects. Other cumulative projects would not contribute significantly to cumulative impacts on nesting pond-associated birds. Under the No Action Alternative, no construction-related impacts would occur. Thus, cumulative impacts would be less than significant.

Alternative A Level of Significance: Less than Significant

Alternative B. As discussed for Alternative A above, other cumulative projects would not contribute significantly to cumulative impacts on nesting pond-associated birds. Under Alternative B, construction would occur at a number of locations throughout the SBSP Restoration Project Area. However, with implementation of measures to avoid and minimize impacts (*i.e.*, seasonal avoidance and pre-construction surveys), SBSP Restoration Project impacts to breeding pond-associated birds are expected to be less than significant (for reasons discussed in SBSP Impact 3.6-11 in Section 3.6, Biological Resources).

Therefore, the cumulative impacts of Alternative B and the other cumulative projects would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. Cumulative impacts would be the same as those described under Alternative B.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. Under the No Action Alternative, no construction-related impacts would occur as a result of the SBSP Restoration Project, and impacts from other cumulative projects would be less than significant.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. Cumulative impacts would be the same as those described under Alternative B.

Phase 1 Actions Level of Significance: Less than Significant

Cumulative Impact 3.6-12: **Potential disturbance to or loss of sensitive wildlife species due to ongoing monitoring, maintenance, and management activities.**

Alternative A. Monitoring, maintenance, and management activities occur at numerous other locations throughout the Bay Area as part of other cumulative projects. Occasionally these activities result in some local, limited adverse effects on sensitive species, such as direct take, nest disturbance, or habitat modification. For example, O&M activities associated with infrastructure, such as PG&E transmission lines, could result in adverse effects, as opposed to the beneficial effects to pond-associated species from management of levees or water-control structures. However, these activities collectively result in a benefit for sensitive species by maintaining overall habitat conditions in the long term or, through informing long-term management decisions, for the species that may be occasionally adversely affected. Even where the management activities are employed for purposes other than wildlife habitat management (*e.g.*, for salt production at Cargill-operated ponds), such management maintains conditions within the ponds for the species that could potentially be affected in the short term. The net result of these monitoring, maintenance, and management activities on sensitive species is generally beneficial. The contribution of other cumulative projects to this cumulative impact would be less than significant/beneficial.

Under the No Action Alternative, there would be no increase in monitoring relative to existing levels. Although some ponds would continue to be managed, necessitating some management and maintenance, there would be a net decrease in management and maintenance activities, relative to existing conditions, under this alternative. Continued maintenance and management of some ponds would have a net benefit on biological resources by maintaining desirable conditions within those ponds. Alternative A's contribution to this cumulative impact would be less than significant/beneficial.

The cumulative impacts of Alternative A and the other cumulative projects would be less than significant/beneficial.

Alternative A Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Alternative B. As discussed for Alternative A above, the contribution of other cumulative projects to this cumulative impact would be less than significant/beneficial. Under Alternative B, monitoring in the SBSP Restoration Project Area would increase relative to existing conditions, as described in the Adaptive Management Plan. With incorporation of impact avoidance and minimization measures into the Project, as described for SBSP Impact 3.6-12, substantial impacts to biological resources as a result of monitoring, maintenance, and management activities for the SBSP Restoration Project are not anticipated. Alternative B's contribution to this cumulative impact would be less than significant/beneficial.

As discussed for Alternative A, the net result of monitoring, maintenance, and management activities associated with habitat management on sensitive species at locations throughout the Bay Area is generally beneficial. Although some types of O&M activities, such as those associated with infrastructure such as PG&E transmission lines, could have adverse effects on sensitive wildlife species, the cumulative impacts of Alternative B and the other cumulative projects would be less than significant/beneficial.

Alternative B Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Alternative C. Cumulative impacts would be the same as those described under Alternative B.

Alternative C Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Phase 1 No Action. Cumulative impacts would be the same as those described under Alternative A.

Phase 1 No Action Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Phase 1 Actions. Cumulative impacts would be the same as those described under Alternative B.

Phase 1 Actions Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Cumulative Impact 3.6-13: **Potential effects of habitat conversion and pond management on steelhead.**

Alternative A. Under the No Action Alternative, no new water control structures would be added, but no fish screens would be added to existing structures. Thus, at least in the short term, any entrainment of steelhead currently occurring would continue in the ponds that are being actively managed. As discussed for SBSP Impact 3.6-13, the unintentional breaching expected to occur in some ponds under the No Action Alternative in the long term would result in some net benefit to steelhead. Alternative A's contribution to cumulative impacts on steelhead would be less than significant/beneficial.

Other tidal restoration projects in the Bay Area are likely to also have beneficial effects on steelhead through the restoration of estuarine habitat that may be used by this species. The contribution of other cumulative projects to cumulative impacts on steelhead would be less than significant/beneficial.

Therefore, the net cumulative impacts on steelhead of other cumulative projects in the Bay Area would be beneficial, and Alternative A would not contribute to any cumulative adverse impacts to steelhead. The cumulative impacts of Alternative A and the other cumulative projects would be less than significant.

Alternative A Level of Significance: Less than Significant

Alternative B. As discussed for Alternative A, above, the contribution of other cumulative projects to cumulative impacts on steelhead would be less than significant/beneficial. As discussed for SBSP Impact 3.6-13, under Alternative B, approximately 50 percent of the SBSP Restoration Project Area would be managed as pond habitat for birds, with 50 percent restored to tidal habitats. Minor impacts to steelhead may occur due to entrapment within managed ponds, and possibly within restored marshes. However, the number of individuals that might be adversely affected by entrainment is expected to be very low, and Alternative B would have a net benefit to steelhead by increasing the extent of subtidal habitat within restored marshes and reducing the number of ponds with intake structures. Alternative B's contribution to cumulative impacts on steelhead would be less than significant/beneficial. The cumulative impacts of Alternative B and the other cumulative projects would be less than significant/beneficial.

Alternative B Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Alternative C. Cumulative impacts would be the same as those described under Alternative B.

Alternative C Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Phase 1 No Action. Cumulative impacts would be the same as those described under Alternative A.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. As discussed for Alternative A above, the contribution of other cumulative projects to cumulative impacts on steelhead would be less than significant/beneficial. Phase 1 actions at the Eden Landing and Ravenswood pond complexes are expected to have little to no effect on steelhead, and any potential adverse effect from entrainment in Alviso would be minimized by the installation of a fish screen on the intake to Pond A16 and offset by the benefits of tidal restoration at Pond A6. The Phase 1 actions' contribution to cumulative impacts on steelhead would be less than significant/beneficial. The cumulative impacts of the Phase 1 actions and the other cumulative projects would be less than significant/beneficial.

Phase 1 Actions Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Cumulative Impact 3.6-14: **Potential impacts to estuarine fish.**

Alternative A. Other tidal restoration projects underway or proposed in the San Francisco Bay Area are expected to benefit estuarine fish by increasing the extent, quality, and productivity of habitat for these species. Therefore, the contribution of other cumulative projects to cumulative impacts on estuarine fish would be less than significant/beneficial.

Under the No Action Alternative, there would be some loss of managed pond habitat used by fish due to unintentional breaches and conversion of some ponds to unmanaged seasonal wetlands. In addition, low water quality in discharges from ponds that remain managed could potentially adversely affect fish (though this effect would not be as great as it is currently, as there would be fewer managed ponds than currently exist). However, such impacts are expected to be minor, as managed ponds currently provide important habitat for relatively few fish species, and pond managers are becoming increasingly adept at avoiding problems of low water quality discharges from managed ponds. Minor impacts to some species may occur due to entrapment within managed ponds. However, overall, estuarine fish are expected to benefit considerably from the increase in tidal habitat that would occur due to unintentional breaching of ponds. Alternative A's contribution to cumulative impacts on estuarine fish would be less than significant/beneficial.

Therefore, the net cumulative impacts on estuarine fish of Alternative A and other cumulative projects in the Bay Area would be beneficial.

Alternative A Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Alternative B. As discussed for Alternative A above, the contribution of other cumulative projects to cumulative impacts on estuarine fish would be less than significant/beneficial. Adverse impacts to estuarine fish under Alternative B would be similar to those described under Alternative A, and are expected to be minor. However, Alternative B would have even greater benefits to estuarine fish since planned tidal restoration would likely result in more extensive channel networks, higher-order sloughs, and overall greater habitat diversity and extent than would occur in marshes that develop in ponds breached unintentionally. Alternative B's contribution to cumulative impacts on estuarine fish would be less than significant/beneficial. Therefore, the cumulative impacts on estuarine fish of Alternative B and other cumulative projects in the Bay Area would be beneficial.

Alternative B Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Alternative C. Cumulative impacts would be the same as those described under Alternative B.

Alternative C Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Phase 1 No Action. Cumulative impacts would be the same as those described under Alternative A.

Phase 1 No Action Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Phase 1 Actions. As discussed for Alternative A above, the contribution of other cumulative projects to cumulative impacts on estuarine fish would be less than significant/beneficial. Phase 1 actions are expected to have an overall net benefit to estuarine fish, as discussed for Phase 1 Impact 3.6-14. The cumulative impacts on estuarine fish of the Phase 1 actions and other cumulative projects in the Bay Area would be beneficial.

Phase 1 Actions Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Cumulative Impact 3.6-15: **Potential impacts to piscivorous birds.**

Alternative A. Other tidal restoration projects underway or proposed in the San Francisco Bay Area are expected to reduce foraging habitat for piscivorous birds, resulting in a net reduction in impounded foraging habitat but an increase in tidal foraging habitat, and an increase in fish abundance overall. Therefore, the cumulative impacts on piscivorous birds of other cumulative projects in the Bay Area would be beneficial.

Under the No Action Alternative, conversion of some low-salinity ponds to tidal habitats through unintentional breaching, and to vegetated seasonal wetlands as a result of cessation of management, would reduce foraging habitat for piscivorous birds in managed ponds. However, the tidal habitats that develop in breached ponds would provide foraging habitat for some piscivores, and would result in increases in prey fish abundance. Therefore, Alternative A's contribution to cumulative impacts on piscivorous birds would be less than significant.

Pond-associated piscivores such as the American White Pelican would likely decline in the SBSP Restoration Project Area as a result of the decline in managed pond habitat under Alternative A, and this species may decline in other areas where shallow ponded habitats are converted to tidal marsh. However, some redistribution of foraging birds (*e.g.*, to Cargill-managed ponds and other impoundments) is expected, and cumulative impacts of restoration projects in the Bay Area are not expected to result in substantial declines on the scale of West Coast or continental populations. The cumulative impacts of Alternative A and the other cumulative projects would be less than significant.

Alternative A Level of Significance: Less than Significant

Alternative B. As discussed for Alternative A above, the cumulative impacts on piscivorous birds of other cumulative projects in the Bay Area would be beneficial. Compared to Alternative A, Alternative B is expected to result in greater benefits to piscivorous bird species that use tidal channels, sloughs, and open subtidal habitats since planned tidal restoration would likely result in more extensive channel networks, higher-order sloughs, and overall greater habitat diversity and extent than would occur in marshes that develop in ponds breached unintentionally. Alternative B would also include more actively managed ponds than Alternative A, providing more potential foraging habitat for pond-associated piscivores such as the American white pelican. Alternative B's contribution to cumulative impacts would be less than significant.

Cumulative impacts to piscivorous birds under Alternative B, resulting from the SBSP Restoration Project and other cumulative projects in the Bay Area, are expected to be similar to those described above for Alternative A and would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. Cumulative impacts would be the same as those described under Alternative B.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. Cumulative impacts would be the same as those described under Alternative A.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. As discussed for Alternative A above, the cumulative impacts on piscivorous birds of other cumulative projects in the Bay Area would be beneficial. Phase 1 actions at the Ravenswood pond complex are expected to have little effect on piscivorous birds. Phase 1 actions at the Eden Landing and Alviso pond complexes are expected to be beneficial by increasing fish populations and improving the extent and quality of foraging habitat via tidal marsh restoration and increases in the depth of Ponds A5, A7, and A8. The Phase 1 actions' contribution to cumulative impacts would be less than significant. Cumulative impacts of the Phase 1 actions and other cumulative projects would otherwise be the same as those described under Alternative B and would be less than significant.

Phase 1 Actions Level of Significance: Less than Significant

Cumulative Impact 3.6-16: **Potential impacts to dabbling ducks.**

Alternative A. Other tidal restoration projects underway or proposed in the San Francisco Bay Area are expected to benefit dabbling ducks by increasing the extent of habitat for these species. Therefore, the contribution of other cumulative projects to cumulative impacts on dabbling ducks would be less than significant/beneficial.

Under the No Action Alternative, managed pond habitat would be lost due to unintentional breaching and conversion of some managed ponds to vegetated seasonal wetlands. However, the tidal marshes that develop in the breached ponds, and the seasonal wetlands, are both expected to provide nesting and foraging habitat for dabbling ducks. The benefits of Alternative A to dabbling ducks are likely to outweigh any adverse effects of density-dependent mortality at managed ponds, or loss of managed pond habitat. Alternative A's contribution to cumulative impacts would be less than significant/beneficial.

Therefore, the cumulative impacts on dabbling ducks of other cumulative projects in the Bay Area and Alternative A would be beneficial.

Alternative A Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Alternative B. As discussed for Alternative A above, the contribution of other cumulative projects to cumulative impacts on dabbling ducks would be less than significant/beneficial. Compared to Alternative A, Alternative B is expected to result in greater benefits to dabbling ducks since planned tidal restoration would likely result in more extensive channel networks, higher-order sloughs, more marsh ponds, and overall greater habitat diversity and extent than would occur in marshes that develop in ponds breached unintentionally. Alternative B would also include more actively managed ponds than Alternative A, providing more and higher-quality pond habitat for dabbling ducks. Alternative B's contribution to cumulative impacts would be less than significant/beneficial.

Therefore, the cumulative impacts on dabbling ducks of other cumulative projects in the Bay Area and Alternative B would be less than significant/beneficial.

Alternative B Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Alternative C. Cumulative impacts would be the same as those described under Alternative B.

Alternative C Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Phase 1 No Action. Cumulative impacts would be the same as those described under Alternative A.

Phase 1 No Action Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Phase 1 Actions. As discussed for Alternative A above, the contribution of other cumulative projects to cumulative impacts on dabbling ducks would be less than significant/beneficial. Phase 1 actions are expected to have an overall net benefit to dabbling ducks, as discussed for Phase 1 Impact 3.6-16. The Phase 1 actions' contribution to cumulative impacts would be less than significant/beneficial. Therefore, the cumulative impacts on dabbling ducks of other cumulative projects in the Bay Area and the Phase 1 actions would be less than significant/beneficial.

Phase 1 Actions Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Cumulative Impact 3.6-17: **Potential impacts to harbor seals.**

Alternative A. Of the other cumulative projects that may occur in San Francisco Bay, and that could affect harbor seals, the other tidal restoration projects underway or proposed in the Bay Area are expected to have the greatest effect on harbor seals. Like the SBSP Restoration Project, these other tidal restoration projects are also expected to benefit harbor seals by increasing estuarine fish abundance and augmenting foraging and haul-out habitat for harbor seals. The contribution of other cumulative projects to cumulative impacts on harbor seals would be less than significant/beneficial.

Under the No Action Alternative, unintentional breaching would convert some managed ponds to tidal habitats, increasing estuarine fish abundance and augmenting foraging and haul-out habitat for harbor seals. These beneficial effects are expected to outweigh any adverse effects resulting from disturbance by

O&M activities or bioconcentration of mercury from breached ponds. Alternative A's contribution to cumulative impacts would be less than significant/beneficial.

Therefore, the cumulative impacts on harbor seals of Alternative A and other cumulative projects in the Bay Area would be less than significant/beneficial.

Alternative A Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Alternative B. As discussed for Alternative A above, the contribution of other cumulative projects to cumulative impacts on harbor seals would be less than significant/beneficial. Adverse impacts to harbor seals under Alternative B would be similar to those described under Alternative A, and are expected to be minor. However, Alternative B would have even greater benefits to harbor seals since planned tidal restoration is expected to result in greater increases in fish abundance and harbor seal foraging and haul-out habitat. Alternative B's contribution to cumulative impacts would be less than significant/beneficial.

As discussed for Alternative A, the cumulative impacts on harbor seals of Alternative B and other cumulative projects in the Bay Area would be beneficial.

Alternative B Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Alternative C. Cumulative impacts would be the same as those described under Alternative B.

Alternative C Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Phase 1 No Action. Cumulative impacts would be the same as those described under Alternative A.

Phase 1 No Action Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Phase 1 Actions. As discussed for Alternative A above, the contribution of other cumulative projects to cumulative impacts on harbor seals would be less than significant/beneficial. Phase 1 actions at the Ravenswood pond complex are not expected to affect harbor seals, either positively or negatively. Phase 1 actions at the Eden Landing pond complex and, the Alviso pond complex in particular are expected to benefit harbor seals, as tidal restoration in Ponds E8A, E8X, E9, and A6 would expand subtidal foraging habitat, increase the availability of potential haul-out locations for harbor seals, and increase prey fish populations. The Phase 1 actions' contribution to cumulative impacts would be less than significant/beneficial.

The cumulative impacts on harbor seals of the Phase 1 actions and other cumulative projects in the Bay Area would be beneficial.

Phase 1 Actions Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Cumulative Impact 3.6-18: **Potential recreation-oriented impacts to sensitive species and their habitats.**

Alternative A. Under the No Action Alternative, no additional recreation access would be planned. Although unintentional breaching of unmanaged pond levees may increase the potential for boating within restored sloughs, the benefits of such tidal restoration to tidal species would outweigh any adverse effects from disturbance associated with increased boating.

Other public access and recreation projects (including flood control projects with recreation components) in the Bay Area are proposed. Public access has considerable potential to result in long-term benefits to sensitive species in the Bay Area by improving public education concerning the importance of Bay-Area habitats, and the restoration thereof. Such education and public enjoyment of the Bay's biological resources may be important in maintaining public support for adequate funding for future restoration and long-term monitoring and management of Bay habitats.

Nevertheless, many of the proposed recreation projects have the potential to result in disturbance of sensitive species. Other cumulative projects involving tidal habitat restoration are expected to result in a net benefit to populations of tidal-associated species, even if some additional human disturbance occurs. The effects of human disturbance on species associated with ponds may be more important, since pond-associated birds would be concentrated in smaller areas Because most managed pond habitat used by sensitive, pond-associated species in the Bay area occurs within the SBSP Restoration Project Area or, in the case of Cargill-managed ponds, is not accessible to the public, cumulative impacts to pond-associated species resulting from recreation-oriented disturbance would be driven by effects within the SBSP Restoration Project Area. As a result, the effects of other cumulative projects on pond-associated species are less than significant. Because Alternative A would result in a less than significant impact (as discussed in SBSP Impact 3.6-18), the cumulative impacts of Alternative A and the other cumulative projects would be less than significant.

Alternative A Level of Significance: Less than Significant

Alternative B. As discussed for Alternative A, above, the contribution of other cumulative projects to cumulative impacts to sensitive wildlife species would be less than significant. Alternative B would result in increased recreational access, and thus increased potential for disturbance of sensitive wildlife species. However, the relative effect of disturbance to species associated with tidal habitats would decline, as the considerable increase in such habitat under Alternative B would more than compensate for any adverse effects of increased public access on numbers of tidal-associated species. In addition, as discussed for SBSP Impact 3.6-18, measures would be taken to minimize impacts from such recreational access on sensitive wildlife.

Under the SBSP Restoration Project's Adaptive Management Plan, potential effects of human disturbance would be monitored, and adaptive management would be implemented to prevent impacts from the SBSP Restoration Project from reaching a significant level. In addition, monitoring of numbers of individual species and groups of species, as described under other impacts and in the Adaptive Management Plan, would determine whether the SBSP Restoration Project is having adverse effects on those taxa. If

monitoring under the SBSP Restoration Project's Adaptive Management Plan indicates that recreation-oriented impacts are having adverse effects on any particular taxa, the Project would determine whether cumulative impacts to the species/groups in question, resulting from all ongoing projects in the Bay Area, are approaching the threshold of significance. If so, the Project would implement adaptive management actions to ensure that cumulative impacts resulting from recreation do not become significant. Alternative B's contribution to cumulative impacts would be less than significant. The cumulative impacts of Alternative B and the other cumulative projects would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. Cumulative impacts would be the same as those described under Alternative B.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. As discussed for Alternative A above, the contribution of other cumulative projects to cumulative impacts to sensitive wildlife species would be less than significant. Under the No Action Alternative, no additional recreation access would be planned. Although unintentional breaching of unmanaged pond levees may increase the potential for boating within restored sloughs, the benefits of such tidal restoration to tidal species would outweigh any adverse effects from disturbance associated with increased boating. Cumulative impacts associated with the Phase 1 No Action and other cumulative projects would be less than significant.

Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 Actions. As discussed for Alternative A above, the contribution of other cumulative projects to cumulative impacts would be less than significant. Increased recreational access resulting from Phase 1 actions may affect sensitive species and their habitats. However, these effects would be monitored and managed, and implementation of the Adaptive Management Plan would ensure that cumulative impacts to sensitive species and their habitats do not reach significant levels, as described for Alternative B above. The Phase 1 actions' contribution to cumulative impacts would be less than significant. The cumulative impacts of the Phase 1 actions and the other cumulative projects would be less than significant.

Phase 1 Actions Level of Significance: Less than Significant

Cumulative Impact 3.6-19: **Potential impacts to special-status plants.**

Alternative A. Given the extent of potential habitat for special-status plants, other cumulative projects are not expected to result in a decline in habitat to the point that Bay Area populations are adversely affected. Conversely, it is possible that tidal habitat restoration could result in increases in habitat used by special-status plants. Therefore, the contribution of other cumulative projects to cumulative impacts would be less than significant.

There are no known populations of special-status plants likely to be affected by the No Action Alternative. Under this alternative, potential habitat for special-status plants could be enhanced through the uncontrolled breaching of existing salt pond levees and subsequent restoration of tidal marsh. However, because such restoration is uncontrolled, the high marsh/upland transition habitat and beach habitat used by special-status plants in the Bay Area are not expected to develop, at least not to the level of quality that would be achieved through directed restoration under Alternatives B and C. Alternative A's contribution to cumulative impacts would be less than significant.

Therefore, the cumulative impacts of Alternative A and the other cumulative projects would be less than significant.

Alternative A Level of Significance: Less than Significant

Alternative B. Because the SBSP Restoration Project is not expected to have adverse effects on special-status plants, cumulative impacts would be the same as those described under Alternative A.

Alternative B Level of Significance: Less than Significant

Alternative C. Cumulative impacts would be the same as those described under Alternative A.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. Cumulative impacts would be the same as those described under Alternative A.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. Cumulative impacts would be the same as those described under Alternative A.

Phase 1 Actions Level of Significance: Less than Significant

Cumulative Impact 3.6-20: **Colonization of mudflats and marshplain by non-native *Spartina* and its hybrids.**

Alternative A. Baywide tidal restoration efforts must be coordinated with the Invasive Spartina Project to ensure that any restoration activities undertaken do not conflict with the program's goals and procedures. The assumption of this Project is that the Invasive Spartina Project will be successful; therefore, the contribution of other cumulative projects to cumulative *Spartina* impacts would be less than significant.

Under the No Action Alternative, unintentional breaching of levees and subsequent increases in tidal habitat could inadvertently help spread non-native *Spartina*. Although the control efforts via the Invasive Spartina Project are currently underway, smooth cordgrass and its hybrids may quickly invade tidally restored areas (Ayres and Strong 2004). Restoration sites on former salt ponds offer unvegetated areas where seedlings can grow unhindered by competition, and often in conditions sheltered from wave action.

Given these ideal circumstances for establishment, smooth cordgrass and its hybrids are likely to rapidly colonize restored salt ponds (Ayres and Strong 2004) and become a dominant plant species in the restored tidal marshes if the species is not controlled. Alternative A's contribution to cumulative impacts would be less than significant.

Therefore, the cumulative impacts of Alternative A and the other cumulative projects would be less than significant.

Alternative A Level of Significance: Less than Significant

Alternative B. As discussed under Alternative A, above, the assumption of this Project is that the Invasive Spartina Project will be successful and thus the contribution of other cumulative projects to cumulative impacts would be less than significant. Under Alternative B, intentional breaching of levees and subsequent increases in tidal habitat could inadvertently help spread non-native *Spartina*. However, it is assumed that the Invasive Spartina Project would prevent the spread of non-native *Spartina* within the SBSP Restoration Project Area as well as throughout the Bay Area. The Project would help accomplish this through implementation of the "best practices" developed in cooperation with the Invasive *Spartina* Project. Therefore, the cumulative impacts of Alternative A and the other cumulative projects would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. Cumulative impacts would be the same as those described under Alternative B.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. Cumulative impacts would be the same as those described under Alternative A.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. Cumulative impacts would be the same as those described under Alternative B.

Phase 1 Actions Level of Significance: Less than Significant

Cumulative Impact 3.6-21: **Colonization by non-native *Lepidium*.**

Alternative A. It is anticipated that the increased salinity and tidal scour associated with additional tidal prism resulting from unintentional breaching under Alternative A, as well from other tidal restoration projects in the Bay, would only reduce the amount of new brackish marsh areas that would be susceptible to *Lepidium* colonization. As a result, the net effect of other restoration projects in the Bay Area would be to reduce the proportion of tidal marsh in the region that is colonized by non-native *Lepidium*. The impacts of other cumulative projects would be less than significant, and Alternative A's contribution to cumulative impacts would be less than significant.

Therefore, the cumulative impacts of Alternative A and the other cumulative projects would be less than significant.

Alternative A Level of Significance: Less than Significant

Alternative B. As discussed for Alternative A above, the contribution of other cumulative projects to cumulative impacts would be less than significant. Under Alternative B, approximately 50 percent of the SBSP Restoration Project Area would be managed as pond habitat for birds, with 50 percent restored to tidal habitats. Breaching of levees and subsequent increases in tidal prism could reduce the amount of brackish marsh habitat available for colonization by *Lepidium*. However, large areas of created upland transition zone habitat would also provide new areas for potential *Lepidium* colonization. Monitoring and adaptive management would prevent impacts from the SBSP Restoration Project from becoming substantial. Alternative B's contribution to cumulative impacts would be less than significant.

Cumulatively, the increased salinity and tidal scour associated with all tidal restoration projects in the Bay Area are expected to reduce the proportion of tidal marsh in the region that is colonized by non-native *Lepidium*. Therefore, the cumulative impacts of Alternative B and the other cumulative projects would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. Cumulative impacts would be the same as those described under Alternative B.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. Cumulative impacts would be the same as those described under Alternative A.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. As discussed for Alternative A above, the contribution of other cumulative projects to cumulative impacts would be less than significant. Phase 1 actions would likely reduce the area that is suitable for *Lepidium* colonization by increasing the tidal prism along OAC and Alviso Slough. However, some portions of the tidal marsh that develops within Ponds A6, E8A, E8X, and E9 may support this species, and vegetation management would be necessary to prevent *Lepidium* from infesting the islands created in each of the three pond complexes as part of Phase 1 actions. As described for Alternative B above, monitoring and adaptive management would prevent impacts from the SBSP Restoration Project from becoming substantial. The Phase 1 actions' contribution to cumulative impacts would be less than significant. Therefore, the cumulative impacts resulting from the Phase 1 actions and other cumulative projects in the Bay Area would be less than significant.

Phase 1 Actions Level of Significance: Less than Significant

Cumulative Impact 3.6-22: **Potential increase in exposure of wildlife to avian botulism and other diseases.**

Alternative A. Other tidal restoration projects in the Bay Area are expected to reduce the potential for wildlife disease outbreaks, as impoundments and diked habitats with poor circulation (many of which will be restored to tidal action by ongoing and proposed restoration projects) foster the conditions conducive to avian botulism outbreaks. In contrast, functional tidal marshes that are regularly flushed by the tides are not effective incubators of botulism. Therefore, the contribution of other cumulative projects to cumulative impacts would be less than significant.

Under the No Action Alternative, the number and extent of managed ponds would be reduced as a result of unintentional breaching, which would reduce the number of ponds. However, the number of ponds in which avian botulism might be cultivated may increase, as the ponds that are no longer managed may have poor water circulation, enhancing the conditions that could result in an avian botulism outbreak. With limited funding for monitoring and pond maintenance (*e.g.*, to maintain adequate water circulation), there is some potential for impacts of avian botulism on waterbirds in the South Bay to be substantial, although USFWS and CDFG staff would be expected to note any evidence of avian botulism (*i.e.*, afflicted birds) and respond to such outbreaks as necessary. Alternative A's contribution to cumulative impacts would be potentially significant.

Because Alternative A has the potential to result in seasonal wetlands and unmanaged ponds with poor circulation, the cumulative impact of Alternative A and the other cumulative projects would be significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As discussed for Alternative A above, the contribution of other cumulative projects to cumulative impacts would be less than significant. Under Alternative B, approximately 50 percent of the SBSP Restoration Project Area would be managed as pond habitat for birds, with 50 percent restored to tidal habitats. The managed ponds could potentially harbor conditions conducive to botulism outbreaks, and concentration of pond-associated birds into a smaller pond footprint could facilitate the spread of any such disease among individuals. However, ensuring adequate circulation of water within managed ponds and implementation of other measures to avoid low DO conditions (see Section 3.4, Surface Water, Sediment and Groundwater Quality), including monitoring and adaptive management, is expected to minimize the potential for such outbreaks. Also, observers conducting regular bird monitoring surveys, as well as USFWS and CDFG staff, would note any evidence of avian botulism (*i.e.*, afflicted birds) and respond to such outbreaks as necessary. Alternative B's contribution to cumulative impacts would be less than significant.

The cumulative impact of Alternative B coupled with other tidal restoration projects in the Bay Area is expected to be a reduction in the extent of areas harboring conditions suitable for botulism outbreaks, and thus the cumulative impact would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. Cumulative impacts would be the same as those described under Alternative B.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. As discussed for Alternative A above, the contribution of other cumulative projects to cumulative impacts would be less than significant. Seasonal wetlands and unmanaged ponds may harbor conditions conducive to avian botulism outbreaks, and in the short term, the Phase 1 No Action could result in such increases in disease. However, in the long term, several of the Phase 1 ponds would be converted to tidal habitats via unintentional breaching, and the Phase 1 ponds that would be maintained as managed ponds in the long term under the No Action Alternative (*i.e.*, Ponds SF2, A8, and A16) would receive some maintenance and management attention from the landowners. USFWS and CDFG staff would be expected to note any evidence of avian botulism (*i.e.*, afflicted birds) and respond to such outbreaks as necessary. As a result, it is unlikely that the No Action Alternative is expected to result in substantially increased exposure of wildlife to diseases in the long term. The Phase 1 No Action's contribution to cumulative impacts would be less than significant.

Given that other restoration projects are expected to reduce the extent of areas harboring conditions suitable for botulism outbreaks, the cumulative impact of the Phase 1 No Action and the other cumulative projects would be less than significant.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. As discussed for Alternative A above, the contribution of other cumulative projects to cumulative impacts would be less than significant. Phase 1 actions include the management of Ponds E12, E13, A16, and SF2 as shallow-water ponds. Such ponds have the potential to support warm, low-oxygen water that favors avian botulism. However, adequate circulation within these ponds, monitoring of pond conditions, monitoring of birds for signs of avian botulism, and adaptive management as necessary to avoid conditions that favor this disease would avoid any adverse effects on waterbirds from becoming substantial. The Phase 1 actions' contribution to cumulative impacts would be less than significant.

Given that other restoration projects are expected to reduce the extent of areas harboring conditions suitable for botulism outbreaks, the cumulative impact of the Phase 1 actions and the other cumulative projects would be less than significant.

Phase 1 Actions Level of Significance: Less than Significant

Cumulative Impact 3.6-23: **Potential impacts to bay shrimp populations.**

Alternative A. Other tidal restoration projects in the Bay Area are expected to result in increased habitat for bay shrimp, and their contribution to cumulative impacts would be beneficial. Under the No Action Alternative, the expected failure of unmaintained levees and resulting unintentional tidal restoration would increase estuarine habitat for bay shrimp by increasing salinity in some areas that currently have fresher water and increasing the extent of tidal habitats. Although low water quality in discharges from

those ponds where management would continue may adversely affect bay shrimp, such impacts are expected to be minor, as pond managers are becoming increasingly adept at avoiding problems of low water quality discharges from managed ponds. Alternative A's contribution to cumulative impacts would be less than significant.

The cumulative impact of Alternative A and other cumulative projects in the region would be less than significant/beneficial.

Alternative A Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Alternative B. As discussed for Alternative A, other tidal restoration projects in the Bay Area are expected to result in increased habitat for bay shrimp, and their contribution to cumulative impacts would be beneficial. Under Alternative B, approximately 50 percent of the SBSP Restoration Project Area would be managed as pond habitat for birds, with 50 percent restored to tidal habitats. Although low water quality in discharges from those ponds where management would continue may adversely affect bay shrimp, such impacts are expected to be minor, as pond managers are becoming increasingly adept at avoiding problems of low water quality discharges from managed ponds. Alternative B's contribution to cumulative impacts would be less than significant. The cumulative impact of Alternative B and the other cumulative projects in the region would be less than significant/beneficial.

Alternative B Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Alternative C. Cumulative impacts would be the same as those described under Alternative B.

Alternative C Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Phase 1 No Action. Cumulative impacts would be the same as those described under Alternative A.

Phase 1 No Action Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Phase 1 Actions. As discussed for Alternative A, other tidal restoration projects in the Bay Area are expected to result in increased habitat for bay shrimp, and their contribution to cumulative impacts would be beneficial. Phase 1 actions are expected to have a net beneficial effect on bay shrimp due to tidal marsh restoration. Implementation of measures to avoid low DO conditions (see Section 3.4, Surface Water, Sediment and Groundwater Quality), including monitoring and adaptive management, is expected to minimize the potential for water-quality problems associated with discharges from managed ponds. The Phase 1 actions' contribution to cumulative impacts would be less than significant. The cumulative impact of the Phase 1 actions and the other cumulative projects in the region would be less than significant/beneficial.

Phase 1 Actions Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Recreation Resources

Cumulative Impact 3.7-1: **Provision of new public access and recreation facilities, including the opening of new areas for recreational purposes and completion of the Bay Trail spine.**

Alternative A. Recreation-related projects (*e.g.*, construction of trails and park facilities) identified in the planned project lists of local jurisdictions and other cumulative restoration and flood control projects would provide new recreation opportunities (both active and passive) through the development of public access, trails, or other recreation features (*e.g.*, park facilities, pools). In addition, 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 development projects) may also require the installation of recreational components. Additional recreation opportunities offered by the cumulative projects would meet at least some of the existing and potential future demand that is anticipated with the projected growth in the South Bay. Recreation opportunities provided by other cumulative projects are beneficial because these projects would offer the public the ability to enjoy recreation activities of all types and experiences, both indoors and outdoors.

Because no new public access or recreation facilities are proposed under Alternative A, it would not contribute to existing cumulative impacts (see SBSP Impact 3.7-1 in Section 3.7). As such, the project would not contribute to any cumulative impacts. Therefore, the cumulative impact of Alternative A and other cumulative projects would be less than significant/beneficial.

Alternative A Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Alternative B. As discussed above, the impact resulting from other cumulative projects is less than significant/beneficial. As described in SBSP Impact 3.7-1, new recreation facilities, including trails, viewing areas, kayak launches, and interpretative stations are proposed under Alternative B. In addition, Alternative B proposes trail segments intended to fill gaps of the Bay Trail. This alternative offers the maximum feasible public access in keeping with BCDC policies. As such, Alternative B's contribution to cumulative impacts associated with the provision of public access and recreation facilities would be beneficial as it would add to the existing and future recreation system. Therefore, the cumulative impact of Alternative B and other cumulative projects would be less than significant/beneficial.

Alternative B Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Alternative C. Due to the similarity of Alternatives B and C, cumulative impacts would be the same as discussed under Alternative B.

Alternative C Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Phase 1 No Action. As discussed above, recreation opportunities provided by other cumulative projects are beneficial. Under the No Action Alternative, no new public access or recreation facilities would be provided. Consequently, the No Action Alternative would not contribute to existing cumulative impacts at either the program- or project-level. Cumulative impacts associated with the Phase 1 No Action and other cumulative projects would be less than significant/beneficial.

Phase 1 No Action Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Phase 1 Actions. As discussed above, recreation opportunities provided by other cumulative projects are beneficial. The Phase 1 actions would provide a wide range of public access and recreation facilities and open new areas for recreational access, including trails, kayak launch, viewing platforms and interpretative stations. The inclusion of proposed recreational facilities under the Phase 1 actions would contribute positively to the existing and future recreation system. The incremental contribution to cumulative impacts from Phase 1 actions would be beneficial, and cumulative impacts of the Phase 1 actions and other cumulative projects would be less than significant/beneficial.

Phase 1 Actions Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Cumulative Impact 3.7-2: **Permanent removal of existing recreational features (trails) in locations that visitors have been accustomed to using and which would not be replaced in the general vicinity of the removed feature.**

Alternative A. It is possible that over time, with several new and expanded public access and recreation projects identified in planned project lists of local jurisdictions and other cumulative restoration and flood control projects, there may be a need to remove existing facilities which visitors have been accustomed to using. This is likely as new infrastructure or restoration projects may require removal or relocation of existing public access facilities. Other cumulative projects (development projects) are not expected to result in the permanent removal of existing recreational features; some projects (*e.g.*, residential development projects) may also require the installation of recreational components. Future environmental review as well as local and statewide policies and requirements should ensure that new and replaced public access and recreational facilities are added to provide for the public demand of such facilities. Although there are limited studies on recreational demand in the Bay Area, it is known that overall population is increasing, which may generate an increased demand for recreation and public access. While there may be some losses or permanent removal of recreational facilities, the construction of new and or replaced facilities should be greater than that loss; therefore, impacts from the permanent removal of recreational features associated with cumulative projects would be less than significant.

Alternative A would not require the removal of any recreational facilities. However, as some of the levees supporting existing trails (at the Alviso and Ravenswood pond complexes) naturally deteriorate from limited levee maintenance that would occur under Alternative A, the integrity of existing trails has the potential to decline resulting in the potential closure of trails. Existing trails would continue to be maintained at the Eden Landing, Alviso and Ravenswood pond complexes to the extent feasible (see Figures 2-4b and 2-4c in Chapter 2, Description of Alternatives). The reduction of trails would occur gradually over the 50-year planning period but the landowners would maintain them to the extent possible. However, cumulative impacts from Alternative A and other cumulative projects would be less than significant because as trails deteriorate within the SBSP Restoration Project Area, new trails and recreational facilities would continue to be constructed.

Alternative A Level of Significance: Less than Significant

Alternative B. As described above, impacts resulting from the permanent removal of recreational features associated with cumulative projects would be less than significant. Alternative B proposes the removal of trails at the Ravenswood pond complex but offers a variety of recreational features (including trails, kayak launch, viewing areas, and interpretation stations) that would offer different recreational experiences. No trails would be removed at the Eden Landing and Alviso pond complexes under Alternative B. Because Alternative B would replace the removed trails at the Ravenswood pond complex as well as add new types of recreation, its contribution to cumulative impacts would be less than significant. With an increase in the range of recreational opportunities from Alternative B and other cumulative projects combined, the cumulative impacts of Alternative B and other cumulative projects would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. Impacts resulting from the permanent removal of recreational features associated with cumulative projects would be less than significant, as described above. Alternative C would provide new trails and other recreational components (*e.g.*, trails, kayak launch, viewing areas, and interpretative stations). However, it would also remove an existing trail that passes through the Eden Landing pond complex that allows equestrians access to the Bay. This specific type of recreation use (by equestrians) would not be replaced by any new recreational features under Alternative C. It is unknown whether any of the other cumulative projects would offer this type of activity, and as such, the removal of this trail and associated activity under Alternative C would be a potentially significant impact (see SBSP Impact 3.7-2). The cumulative impact of Alternative C and other cumulative projects would also be potentially significant.

Alternative C Level of Significance: Potentially Significant

Phase 1 No Action. Impacts resulting from the permanent removal of recreational features associated with cumulative projects would be less than significant, as described above. The No Action Alternative would not require the removal of any recreational facilities. However, as some of the levees supporting existing trails naturally deteriorate from limited levee maintenance that would occur under Alternative A, the integrity of existing trails, including the trail along Pond SF2, could decline and result in the potential closure of trails. Existing trails would continue to be maintained at the Phase 1 ponds to the extent feasible (see Figures 2-4b and 2-4c in Chapter 2, Description of Alternatives). The reduction of trails would occur gradually over the 50-year planning period and the landowners would maintain them to the extent possible, so the contribution of impacts from Phase 1 No Action to cumulative impacts would be less than significant. Cumulative impacts of the Phase 1 actions and other cumulative projects would be less than significant because while some trails would be removed or deteriorate, new trails and recreational facilities would continue to be constructed.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. Impacts resulting from the permanent removal of recreational features associated with cumulative projects would be less than significant, as described above. Under the Phase 1 actions, existing trails would continue to be maintained at the Eden Landing, Alviso and Ravenswood pond complexes. In addition, new recreational facilities would be constructed under the Phase 1 actions. Because the Phase 1 actions would result in a net increase in recreation, their contribution to cumulative impacts would be beneficial. With an increase in the range of recreational opportunities from the Phase 1 actions together with the other cumulative projects, the cumulative impacts of the Phase 1 actions and other cumulative projects would be less than significant.

Phase 1 Actions Level of Significance: Less than Significant

Cultural Resources

Cumulative Impact 3.8-1: **Potential disturbance of known and/or unknown cultural resources.**

Alternative A. The development of other cumulative projects (*e.g.*, development, restoration, and flood control) would require excavation and grading activities that could result in the unearthing of known and unknown (recorded and unrecorded) cultural resources that may or may not be considered eligible for listing to the National or California Register of Historic Places. These cumulative projects would have the potential to disturb, alter, or destroy cultural resources during construction activities. 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). These required actions include stopping work, examining and determining the significance of the find by a qualified archaeologist, 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.

As described in SBSP Impact 3.8-1 (see Section 3.8, Cultural Resources), the No Action Alternative would result in less than significant impacts associated with limited O&M operations and the natural changes to Project Area topography (from acts such as tidal breaching, flooding, or channel scour). Because O&M activities would be intermittent over the 50-year planning period and would not require extensive excavation activities, Alternative A's contribution to cumulative impacts would be less than significant. Consequently, the cumulative impacts resulting from Alternative A and other cumulative projects would be less than significant.

Alternative A Level of Significance: Less than Significant

Alternative B. As described above, impacts to cultural resources resulting from other cumulative projects would be less than significant. As described in Section 3.8, Cultural Resources, Alternative B has the potential to result in similar impacts to known and unknown cultural resources during construction activities. The implementation of SBSP Mitigation Measure 3.8-1 would ensure that the Project's

contribution to cumulative impacts would be less than significant. Consequently, the cumulative impacts resulting from Alternative B and other cumulative projects would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. Due to the similarity of Alternatives B and C, cumulative impacts would be the same as discussed under Alternative B.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. As described above, the impacts to cultural resources resulting from the cumulative projects would be less than significant. As described above, the No Action Alternative would involve limited O&M activities and natural changes to the Project Area topography which could in turn disturb cultural resources. For the project-level Phase 1 No Action, the same O&M activities and natural changes would occur. Because O&M activities would be intermittent over the 50-year planning period and would not require massive excavation activities, the Phase 1 No Action's contribution to cumulative impacts would be less than significant. Therefore, the cumulative impacts associated with the Phase 1 No Action and other cumulative projects would be less than significant.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. As described above, the impacts to cultural resources resulting from implementation of the cumulative projects would be less than significant. The Phase 1 actions would involve excavation activities that have the potential to encounter and disturb known or unknown cultural resources. As described in Section 3.8, Cultural Resources, SBSP Mitigation Measure 3.8-1 would be required to reduce potential impacts resulting from the Phase 1 actions to less than significant levels. Consequently, the cumulative impacts of the Phase 1 actions and other cumulative projects would be less than significant.

Phase 1 Actions Level of Significance: Less than Significant

Cumulative Impact 3.8-2: **Disturbance of the historic salt ponds and associated structures which may be considered a significant cultural landscape.**

Alternative A. Cumulative projects, including the Shoreline Study, the PG&E Pond A6 Tower and Boardwalk Modification Project, and flood control and recreation projects, that are located in the area of the existing/former salt ponds would require excavation and grading activities that could result in disturbance of the historic salt ponds and associated structures (*e.g.*, buildings, objects, and structures). Depending on the results of a cultural landscape identification and assessment effort, the salt ponds and associated structures may be considered historically significant. Due to the potential for the SBSP Restoration Project Area and vicinity to be considered a cultural landscape, grading and other construction activities resulting from the cumulative projects would be a significant impact. The Corps would likely consult with SHPO regarding the Shoreline Study potential actions to identify mitigation

measures to address potentially adverse effects on cultural resources. It is unknown whether other cumulative projects that would occur within the Project Area and vicinity would be required to consult with SHPO and make determinations on the significance of the resource relative to the cultural landscape. Due to the potential for lands outside the SBSP Restoration Project Area to be considered a cultural landscape and the uncertainty of individual projects' effects, impacts to the cultural landscape resulting from other cumulative projects would be potentially significant.

As described in SBSP Impact 3.8-2 (see Section 3.8, Cultural Resources), the impact of the No Action Alternative on the cultural landscape would be less than significant because only limited O&M activities would occur. While unplanned breaching of levees due to tidal action, flooding, and channel scour may occur under the No Action Alternative over the 50-year planning period, it is assumed that these actions would have occurred in the natural course of events if the ponds had not been created and so would not be considered a Project-related impact. Similarly, Alternative A's contribution to cumulative impacts would be less than significant because changes to the landscape would occur naturally rather than through specific Project-related actions. Although Alternative A's contribution to this impact would be less than significant, the cumulative impacts of Alternative A and other cumulative projects would be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As described above, cumulative impacts associated with the disturbance of historic salt ponds and associated structures resulting from the implementation of other cumulative projects would be potentially significant. As described in SBSP Impact 3.8-1, depending on the results of a cultural landscape identification and assessment effort, the salt ponds and associated structures (*e.g.*, buildings, objects, and structures) may be considered historically significant. Due to the potential for the Project Area to be considered a cultural landscape, grading and other construction activities under this alternative would result in a significant impact (disturbance of historic salt ponds and associated structures). As such, Alternative B would contribute to potentially significant cumulative impacts. However, implementation of SBSP Mitigation Measure 3.8-2, presented in Section 3.8, Cultural Resources, would reduce the Project's impacts to less-than-significant levels. Although Alternative B's contribution to cumulative impacts would be less than significant with SBSP Mitigation Measure 3.8-2, potential cumulative impacts from the implementation of Alternative B in conjunction with other cumulative projects would be potentially significant.

Alternative B Level of Significance: Potentially Significant

Alternative C. Due to the similarity of Alternatives B and C, cumulative impacts would be the same as discussed under Alternative B.

Alternative C Level of Significance: Potentially Significant

Phase 1 No Action. As described above, cumulative impacts associated with the disturbance of historic salt ponds and associated structures resulting from the implementation of other cumulative projects would be potentially significant. As described for program level Alternative A, the No Action Alternative's

contribution to cumulative impacts would be less than significant because changes to the landscape would occur naturally rather than through specific Project-related actions. Therefore, the cumulative impacts of the Phase 1 No Action and other cumulative projects would be potentially significant.

Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 Actions. As described above, cumulative impacts associated with the disturbance of historic salt ponds and associated structures resulting from the implementation of other cumulative projects would be potentially significant. At the program level, the Project's contribution to cumulative impacts would be less than significant with implementation of SBSP Mitigation Measure 3.8-2 under Alternatives B and C. This mitigation measure would also be required to reduce potentially adverse effects associated with grading activities that would occur under the Phase 1 actions. Implementation of SBSP Mitigation Measure 3.8-2 would ensure that the Phase 1 actions' contribution to cumulative impacts would be less than significant. However, the cumulative impacts of the Phase 1 actions and other cumulative projects would be potentially significant.

Phase 1 Actions Level of Significance: Potentially Significant

---

Land Use

Cumulative Impact 3.9-1: **Land use compatibility impacts.**

Alternative A. Most cumulative projects (especially residential, commercial, and industrial development) are required to conform to the designated uses of general plans and zoning ordinances of affected jurisdictions prior to approval. 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 prior to 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 with 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.

Because the No Action Alternative would not introduce new land uses within the Project Area that would be incompatible with surrounding land uses, Alternative A would not contribute to cumulative land use compatibility effects. Consequently, cumulative impacts resulting from Alternative A and other cumulative projects would be less than significant.

Alternative A Level of Significance: Less than Significant

Alternative B. As described above, land use impacts associated with other cumulative projects would be less than significant. As described in Section 3.9, Land Use, the recreation and restoration features proposed under Alternative B (*e.g.*, tidally restored habitat, recreation facilities) would be consistent with

existing land use and zoning designations and would be compatible with surrounding land uses. Consequently, Alternative B's contribution to cumulative land use compatibility impacts would be less than significant. Cumulative impacts associated with Alternative B and other cumulative projects would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. Due to the similarity of Alternatives B and C, cumulative impacts would be the same as discussed under Alternative B.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. As described above, land use impacts associated with other cumulative projects would be less than significant. Because the No Action Alternative would not introduce new land uses within the Project Area, it would not contribute to cumulative land use compatibility impacts. As such, the overall cumulative impacts associated with the Phase 1 No Action and other cumulative projects would be less than significant.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. As described above, land use impacts associated with other cumulative projects would be less than significant. At the program level, new features proposed under Alternatives B and C (*e.g.*, tidally restored habitat, recreation facilities) would be consistent with existing land use and zoning designations and would be compatible with surrounding land uses. At the project level, the Phase 1 actions would also be consistent with applicable land use and zoning designations and would be compatible with land uses surrounding the Phase 1 ponds. Because the Phase 1 actions would not conflict with existing land use, their contribution o to cumulative land use compatibility would be less than significant. Consequently, cumulative impacts associated with implementation of the Phase 1 actions and other cumulative projects would be less than significant.

Phase 1 Actions Level of Significance: Less than Significant

Public Health and Vector Management

Cumulative Impact 3.10-1: **Potential increase in mosquito populations.**

Alternative A. 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 (*e.g.*, development and infrastructure 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.

Under the No Action Alternative, mosquito densities in the SBSP Restoration Project Area are expected to increase, relative to existing conditions, as described for SBSP Impact 3.10-1 in Section 3.10, Public Health and Vector Management. Under the No Action Alternative, no monitoring would be implemented to determine whether the SBSP Restoration Project is resulting in such increases, and no adaptive management would be implemented to ameliorate such an impact if it occurs.

Because unmanaged seasonal ponds and poorly drained marshes formed by unintentional breaching in the SBSP Restoration Project Area may be extensive under the No Action Alternative, the adverse effects of this alternative in the SBSP Restoration Project Area may outweigh many of the benefits of tidal restoration in other Project Areas. As a result, Alternative A would contribute to increases in mosquito densities in the Bay Area as a whole, and the cumulative impacts of Alternative A and other cumulative projects would be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As discussed under Alternative A, above, the effects of other cumulative projects on mosquito densities would be less than significant. Under Alternative B, approximately 50 percent of the SBSP Restoration Project Area would be managed as shallow pond habitat for birds, with 50 percent restored to tidal habitats. As discussed for SBSP Impact 3.10-1, the tidal habitats restored under this alternative are not expected to increase mosquito breeding habitat substantially, and the managed ponds would be managed to avoid creating additional mosquito breeding habitat. Nevertheless, monitoring and adaptive management would be implemented to ensure that the SBSP Restoration Project does not increase the need for vector management. The contribution of Alternative B to cumulative impacts would be less than significant. Given that the other tidal restoration projects in the Bay Area are also expected to reduce, rather than increase, mosquito breeding habitat, these projects would cumulatively result in a net benefit. The cumulative impacts of Alternative B and other cumulative projects would be less than significant/beneficial.

Alternative B Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Alternative C. Cumulative impacts are expected to be the same as for Alternative B.

Alternative C Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Phase 1 No Action. As discussed under Alternative A, above, the effects of other cumulative projects on mosquito densities would be less than significant. Under the No Action Alternative, mosquito breeding habitat could increase in extent and quality, particularly in the Eden Landing complex, as described for Phase 1 Impact 3.10-1. However, the No Action Alternative is expected to have little effect on mosquito breeding habitat in the Alviso and Ravenswood complexes. Due to the limited area in which mosquito numbers may increase under the Phase 1 No Action at the Eden Landing complex, the benefits (in terms of reducing the extent and quality of mosquito breeding habitat) of other tidal restoration projects in the Bay Area are expected to outweigh the adverse effects from the Phase 1 No Action. Therefore, the net cumulative impact from the Phase 1 No Action and other cumulative projects in the Bay Area would be less than significant.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. As discussed under Alternative A, above, the effects of other cumulative projects on mosquito densities would be less than significant. Phase 1 actions are not expected to result in increases in the extent or quality of mosquito breeding habitat in the South Bay, as discussed for Phase 1 Impact 3.10-1. The contribution of Phase 1 actions to cumulative impacts would be less than significant. Given that the other tidal restoration projects in the Bay Area are also expected to reduce, rather than increase, mosquito breeding habitat, these projects and the Phase 1 actions would cumulatively result in a net benefit. The cumulative impacts of the Phase 1 actions and other cumulative projects would be less than significant/beneficial.

Phase 1 Actions Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Socioeconomics and Environmental Justice

Cumulative Impact 3.11-1: **Displace, relocate, or increase area businesses, particularly those associated with the expected increase in recreational users.**

Alternative A. The simultaneous development and operation of cumulative projects (particularly large-scale residential, commercial, and industrial projects) would change the social and economic dynamics of the communities where the projects occur. Residential units, retail and office space, and industrial facilities would increase in the South Bay in keeping with the projected population growth in the Bay Area. These 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 jurisdiction, 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. As such, the impact of other cumulative projects on area businesses would be beneficial.

As described in Section 3.11, Socioeconomics and Environmental Justice, the ISP resulted in the cessation of commercial brine shrimp harvesting in the Alviso pond complex. The only remaining location within the South Bay where brine shrimp harvesting continues to occur is the Mowry ponds. The only cumulative project within the Mowry ponds would be the Shoreline Study. However, the implementation of Shoreline Study potential actions is unlikely to affect the brine shrimp industry at that location because potential actions would unlikely convert the salt ponds into other uses within the Project's 50-year planning horizon, thus allowing brine shrimp harvesting to continue[2]. Because the ISP resulted in the cessation of brine shrimp harvesting in the Alviso pond complex, impacts resulting from other cumulative projects would be potentially significant.

[2] USFWS will consider renewing existing contracts which allow brine shrimp harvesting at the Mowry ponds. However, this decision is not evaluated as part of the cumulative analysis.

Bay shrimp harvesting occurs within the Bay and sloughs. As described in Section 3.11, Socioeconomics and Environmental Justice, recent changes in salinity reportedly have led this species to decline in abundance in the far South Bay in recent decades (Tom Laine, pers. comm.). Other cumulative projects are not expected to result in effects to the bay shrimp. As such, potential impacts on bay shrimp from cumulative projects would be less than significant.

As described in Section 3.11, Socioeconomics and Environmental Justice, ponds within the SBSP Restoration Project Area would be operated and maintained in a manner similar to the ISP under Alternative A. Under this alternative, no new recreational facilities would be constructed and some public access may be reduced over time with the gradual deterioration of some of the levees which support trail. Consequently, the contribution to cumulative impacts from Alternative A would be less than significant because the limited O&M activities that would occur would have a minimal effect on the economics of the region. Cumulative impacts from the implementation of Alternative A and other cumulative projects would remain beneficial.

As described in SBSP Impact 3.11-1, because brine shrimp harvesting does not currently occur within the Project Area, Alternative A's contribution to cumulative impacts on the brine shrimp harvesting industry would be less than significant. In addition, Alternative A's contribution to cumulative impacts on the bay shrimp industry would be less than significant because Alternative A would not change substantially the health and mortality of the bay shrimp. However, the cumulative impacts resulting from implementation of Alternative A and the other cumulative projects would be potentially significant for brine shrimp harvesting. The cumulative impacts resulting from implementation of Alternative A and the other cumulative projects would be less than significant for bay shrimp harvesting.

Alternative A Level of Significance: Potentially Significant

Alternative B. As described above, the impacts of the cumulative projects on area businesses would be beneficial, and impacts on the bay shrimp harvesting industry would be less than significant. Potential effects of the cumulative projects on brine shrimp harvesting would be potentially significant.

As described in Impact 3.11-1, Alternative B would involve the removal as well as construction of new recreational facilities that provide more opportunities to conduct a variety of outdoor activities. An increase in recreational opportunities would result in potential benefits to area businesses, thus resulting in less than significant/beneficial impacts to cumulative impacts. As discussed for Alternative A above, brine shrimp harvesting does not currently occur within the Project Area, so Alternative B's contribution to cumulative impacts on the brine shrimp harvesting industry would be less than significant. As described in Section 3.11, Alternative B would result in an overall beneficial impact on the bay shrimp harvesting industry by enhancing the bay shrimp population. Therefore, the cumulative impacts of Alternative B and the other cumulative projects would be beneficial on area businesses, less-than-significant on the bay shrimp harvesting industry, and potentially significant on the brine shrimp harvesting industry.

Alternative B Level of Significance: Potentially Significant

Alternative C. Due to the similarity of Alternatives B and C, cumulative impacts would be the same as discussed under Alternative B.

Alternative C Level of Significance: Potentially Significant

Phase 1 No Action. As described above, the impacts of the cumulative projects on area businesses and the bay shrimp harvesting industry would be beneficial and less than significant, respectively. Potential effects of other cumulative projects on brine shrimp harvesting would be potentially significant.

Under the No Action Alternative, no new recreational facilities would be constructed and some public access may be reduced over time with the deterioration of the levees. The Phase 1 No Action would contribute to less-than-significant effects on area businesses due to the potential loss of recreational facilities over time and activities that would result from gradual deterioration of the levees. Phase 1 No Action would have a less-than-significant impact on brine and bay shrimp harvesting as brine shrimp harvesting currently does not occur within the Project Area, and the Phase 1 No Action would not change substantially the health and mortality of the bay shrimp. Therefore, the cumulative impacts of the Phase 1 No Action and other cumulative projects would be less than significant/beneficial for area businesses, less than significant for bay shrimp harvesting, and potentially significant for brine shrimp harvesting.

Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 Actions. Under the Phase 1 actions, new recreational facilities would be constructed. Because of the increased recreational activities offered by this alternative, the Phase 1 actions would contribute to beneficial impacts on area businesses. The Phase 1 actions would not affect brine shrimp harvesting as it does not currently occur within the Project Area, but they would result in less-than-significant effects on bay shrimp harvesting. Therefore, cumulative impacts of the Phase 1 actions and other cumulative projects would be less than significant for area businesses and bay shrimp harvesting and potentially significant for brine shrimp harvesting.

Phase 1 Actions Level of Significance: Potentially Significant

---

Cumulative Impact 3.11-2: **Change lifestyles and social interactions.**

Alternative A. The development and operation of cumulative recreation, restoration, and flood control projects have the potential to change the lifestyles and social interactions within the community where the development occurs by increasing recreational opportunities in nearby communities and region. An increase in such opportunities would enhance the lifestyles of those living in the vicinity and region of these improvements. Therefore, potential impacts associated with other cumulative projects would be beneficial.

As described in SBSP impact 3.11-2 in Section 3.11, the No Action Alternative would not provide any new recreational components that would increase recreational opportunities. Management of the ponds over time has the potential to result in the reduction in integrity of trails and thus their recreational value

(as levees and the trails they support naturally deteriorate due to the reduction in maintenance activities by landowners). It is possible that over time, some of these trails would be lost. Although there may be a reduction in the number of trails over the 50-year planning period, it is likely that this loss would result in a minor change in users' lifestyles and social interaction, since trail users would likely use alternative trails available in the South Bay. Therefore, the contribution of impacts from Alternative A to cumulative impacts would be less than significant. The cumulative impacts of Alternative A and other cumulative projects would be less than significant/beneficial because there are other destinations in the South Bay that provide similar recreational facilities and activities that the public can enjoy, despite the potential incremental reduction in the length of trails that could occur associated with the No Action Alternative.

Alternative A Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Alternative B. As described above, impacts associated with other cumulative projects would be beneficial. Alternative B would remove trails as well as provide new recreational features (*e.g.*, trails, kayak launch, viewing areas, and interpretative stations) that would result in beneficial contributions to cumulative impacts in terms of lifestyles and social interactions. Specifically, these features would expand the range of activities available within the Project Area and open areas that did not previously provide public access. Because of the increase in the range of recreational opportunities, the cumulative impacts of Alternative B and other cumulative projects would be less than significant/beneficial.

Alternative B Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Alternative C. Due to the similarity of Alternatives B and C, cumulative impacts would be the same as discussed under Alternative B.

Alternative C Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Phase 1 No Action. As described above, potential impacts associated with other cumulative projects would be beneficial. Currently, there are no recreational features within the Eden Landing Phase 1 ponds, except for levee trails used for hunting access. The trails located within the Alviso and Ravenswood Phase 1 ponds would be maintained under the No Action Alternative as noted in Cumulative Impact 3.7-1 above. Given that recreational facilities would be maintained (even with some reduction in integrity of the trail along Pond SF2), the Phase 1 No Action's contribution to cumulative impacts would be less than significant. The cumulative impacts of the Phase 1 No Action and other cumulative projects would be less than significant/beneficial because there are other destinations in the South Bay that provide similar recreational facilities and activities that the public can enjoy, despite the potential reduction in the length of trails that could occur associated with the Phase 1 No Action.

Phase 1 No Action Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Phase 1 Actions. As described above, potential impacts resulting from other cumulative projects would be beneficial. At the program level, Alternatives B and C would involve the construction of new recreational features which would expand the range of activities available within the Project Area as well as open areas that did not previously provide public access. This increase in public access and recreation

would contribute to positive lifestyle changes and social interactions. At the project level, Phase 1 actions would similarly increase recreational opportunities. The contribution of Phase 1 actions to cumulative impacts would also be beneficial. Because of the increase in the range of recreational opportunities, the cumulative impacts of the Phase 1 actions and other cumulative projects would be less than significant/beneficial.

Phase 1 Actions Level of Significance: Less than Significant (CEQA)/Beneficial (NEPA)

Cumulative Impact 3.11-3: **Effects disproportionately placed on minority and low-income communities or effects on the ethnic or racial composition in a community.**

Alternative A. Cumulative projects include residential, commercial and industrial development throughout the South Bay. Some of the residential projects may include affordable housing units that are intended to accommodate the housing needs of low-income families. Industrial projects that generate specific types of air pollutants (*e.g.*, odor) could be constructed in areas of densely populated low-income/minority communities. The extent to which the cumulative projects would disproportionately affect minority and low-income communities 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.

As described in SBSP Impact 3.11-3, potential impacts on minority and low-income communities would be potentially significant under Alternative A related to flooding and increases in mosquito populations. As such, the cumulative impacts of Alternative A and other cumulative projects would be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As described above, it is assumed that other cumulative projects would result in a potentially significant cumulative impact on minority and low-income populations.

As discussed in Section 3.11, Socioeconomics and Environmental Justice, Alternative B would result in potential land use impacts that would indiscriminately affect nearby sensitive receptors, regardless of the income level or ethnicity of these receptors. In some cases, mitigation measures have been identified for the project to reduce short-term construction-related potential effects to less than significant levels. In addition, Alternative B would increase recreation opportunities that would provide benefits indiscriminately to people living in the vicinity of the SBSP Restoration Project Area as well as for those living in the region. With the implementation of relevant mitigation measures identified in this EIS/R, the impacts of Alternative B would be less than significant, and with respect to recreation opportunities, beneficial. However, the cumulative impacts on minority and low-income populations resulting from the implementation of Alternative B and other cumulative projects would remain potentially significant.

Alternative B Level of Significance: Potentially Significant

Alternative C. Due to the similarity of Alternatives B and C, cumulative impacts would be the same as discussed under Alternative B.

Alternative C Level of Significance: Potentially Significant

Phase 1 No Action. As described above, it is assumed that other cumulative projects would result in a potentially significant cumulative impact on minority and low-income populations.

At the program level, O&M activities under Alternative A would contribute to potentially significant impacts to cumulative impacts. At the project level, O&M activities under Phase 1 No Action would contribute to potentially significant impacts to cumulative impacts for similar reasons. Cumulative impacts from the Phase 1 No Action and other cumulative projects would therefore be potentially significant.

Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 Actions. As described above, it is assumed that other cumulative projects would result in a potentially significant cumulative impact on minority and low-income populations.

The Phase 1 actions would involve construction activities that have the potential to result in indiscriminate and temporary effects on surrounding sensitive receptors, regardless of their income levels and ethnicity. In addition, Phase 1 actions would increase recreation opportunities that would provide benefits indiscriminately to people living in the vicinity of the SBSP Restoration Project Area as well as for those living in the region. The impact of Phase 1 actions would be less than significant, and with respect to recreation opportunities, beneficial. However, cumulative impacts on minority and low-income populations from the implementation of Phase 1 actions and other cumulative projects would remain potentially significant.

Phase 1 Actions Level of Significance: Potentially Significant

---

Traffic

Cumulative Impact 3.12-1: **Potential short-term degradation of traffic levels on a roadway or at an intersection due to construction.**

Alternative A. 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

impacts associated with the short-term degradation of traffic levels on roadways or intersections could occur, because traffic congestion within the South Bay occurs primarily during the weekday peak hours. Cumulative projects would likely be scattered both geographically (throughout the South Bay) and over time (over the 50-year planning period). In addition, construction-related traffic would likely occur throughout the day, rather than concentrate only during the peak hours. However, because the number of construction-related truck trips is not known for the combination of cumulative projects, potential impacts from other cumulative projects would be potentially significant.

Because the No Action Alternative would not involve construction of new facilities or features within the Project Area, no construction-related traffic would be generated. Consequently, Alternative A would not contribute to cumulative impacts. However, the cumulative impacts of Alternative A and other cumulative projects would remain potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As discussed above, potential impacts from other cumulative projects would be potentially significant. As discussed in Section 3.12, Traffic, Alternative B would generate a substantial increase in construction-related traffic, particularly associated with the delivery of fill material to the Project Area. To reduce potential impacts to less-than-significant levels, the avoidance of peak-hour traffic would be required (see SBSP Mitigation Measure 3.12-1). Implementation of this mitigation measure would ensure that the impacts of Alternative B, and its contribution to cumulative impacts, would be less than significant. The cumulative impacts of Alternative B and other cumulative projects would be potentially significant.

Alternative B Level of Significance: Potentially Significant

Alternative C. Due to the similarity of Alternatives B and C, cumulative impacts would be the same as discussed under Alternative B.

Alternative C Level of Significance: Potentially Significant

Phase 1 No Action. As discussed above, traffic impacts associated with the implementation of cumulative projects would be potentially significant. At the program level, the No Action Alternative would not involve construction of new facilities and thus would not contribute to cumulative impacts. At the project level, the Phase 1 No Action would also not involve construction of new facilities or features within the Phase 1 ponds, and no construction-related traffic would be generated. While no impacts would occur under the Phase 1 No Action, the cumulative impacts resulting from the Phase 1 No Action and other cumulative projects would remain potentially significant.

Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 Actions. As discussed above, traffic impacts associated with the implementation of cumulative projects would be potentially significant. At the program level, Alternatives B and C would require the delivery of a substantial amount of fill and as such would require SBSP Mitigation Measure 3.12-1 to

reduce potentially significant effects. At the project level, because construction of the Phase 1 actions would be temporary (lasting up to six months) and would generate a limited number of construction trips, the impacts resulting from the Phase 1 actions would be less than significant, and no mitigation measures would be required. However, the cumulative impacts resulting from the Phase 1 actions and other cumulative projects would remain potentially significant.

Phase 1 Actions Level of Significance: Potentially Significant

---

Cumulative Impact 3.12-2: **Potential long-term degradation of traffic levels on a roadway or an intersection.**

Alternative A. As described in the setting section above, the population of the South Bay is expected to increase over the next approximate 25 years, and it is anticipated that this trend will continue over the 50-year planning period for the SBSP Restoration Project. 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 an intersection. Long-term traffic increases are addressed by MTC and individual projects that generate operational-related traffic. Projects identified in the MTC Transportation 2030 Plan 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.

As described in Section 3.12, Traffic, the operation of the ponds under the No Action Alternative would require limited, intermittent vehicular traffic associated with O&M activities over the 50-year planning period, which would constitute a less than significant contribution to cumulative impacts. While the effects of Alternative A would be less than significant, the cumulative impacts associated with Alternative A and other cumulative projects would be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As described above, potential impacts on long-term traffic levels resulting from other cumulative projects would be potentially significant. As described in Section 3.12, Traffic, Alternative B would result in additional O&M-related traffic volumes (associated with O&M staff and Adaptive Management Plan monitoring staff) as well as an increase in traffic volumes associated with the increase in recreational opportunities. These trips would contribute to cumulative traffic volumes, but because they would primarily occur during the daytime, weekend hours when recreational activities typically occur, this contribution would be less than significant. In addition, traffic associated with this alternative would be scattered throughout the South Bay and would likely access the Project Area using different

routes. As such, while the effects of Alternative B would be less than significant, the cumulative impacts associated with Alternative B and other cumulative projects would be potentially significant.

Alternative B Level of Significance: Potentially Significant

Alternative C. Due to the similarity of Alternatives B and C, cumulative impacts would be the same as discussed under Alternative B.

Alternative C Level of Significance: Potentially Significant

Phase 1 No Action. As described above, potential impacts on long-term traffic levels from other cumulative projects would be potentially significant. At the program level, the No Action Alternative would generate intermittent vehicle trips over the 50-year planning period, which would constitute a less-than significant contribution to cumulative impacts. At the project level, the Phase 1 No Action would also generate intermittent vehicle trips that would constitute a less-than-significant contribution to cumulative impacts. As such, while the effects of the Phase 1 No Action would be less than significant, the cumulative impacts associated with the implementation of the Phase 1 No Action and other cumulative projects would be potentially significant.

Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 Actions. Potential effects from other cumulative projects, including residential, commercial and industrial development as well as recreation projects, would increase traffic volumes and result in potentially significant operational-traffic impacts as described above in Alternative A. The Phase 1 actions would generate a minimal increase in traffic volumes associated with the increase in recreation opportunities, which would occur primarily during the daytime weekend hours. As such, while the effects of the Phase 1 actions would be less than significant, the cumulative impacts of the Phase 1 actions and other cumulative projects would be potentially significant.

Phase 1 Actions Level of Significance: Potentially Significant

---

Cumulative Impact 3.12-3: **Potential increase in parking demand.**

Alternative A. As described in Cumulative Impact 3.12-2 above, traffic volumes are expected to increase over the next approximate 25 years, and it is anticipated that this trend will continue over the 50-year planning period for the SBSP Restoration Project. An increase in traffic volumes would suggest an increase in parking demand. Future cumulative projects would likely be scattered throughout the entire South Bay. The cumulative projects that may affect parking demand include recreation projects or restoration/flood control projects (*e.g.*, ELER Restoration Project, Shoreline Study) that provide recreational opportunities in the vicinity of the Project Area. Because existing parking is offered at designated and undesignated parking/staging areas surrounding existing recreational facilities (*e.g.*, Mountain View Shoreline Park, Bayfront Park, Refuge EEC, Sunnyvale Water Pollution Control Plant [WPCP]), and on-street parking within industrial areas around the SBSP Restoration Project Area

generally have available spaces during weekend daytime hours when most of the recreational activities occur, potential parking impacts resulting from other cumulative projects would be less than significant.

As described in Section 3.12, Traffic, O&M activities under the No Action Alternative would require limited parking. Vehicles associated with O&M activities would be accommodated within the SBSP Restoration Project Area and would have a less-than-significant impact on parking in surrounding areas. As such, cumulative impacts resulting from Alternative A and other cumulative projects would be less than significant.

Alternative A Level of Significance: Less than Significant

Alternative B. As described above, potential parking impacts resulting from other cumulative projects would be less than significant. As discussed in Section 3.12, Traffic, the increase in recreational users over the long term likely would require additional parking capacity for people who access the Project Area by car. It is expected that parking would be accommodated within existing parking areas or along adjacent roadways; however, because the increase in parking demand has not yet been determined, there is a possibility that there would be insufficient supply in the long term. As such, SBSP Mitigation Measure 3.12-13 would be required to reduce potential parking effects resulting from Alternative B to less-than-significant levels. Because the demand for parking would be scattered throughout the South Bay and the demand for recreation-related parking would occur primarily during the weekend daytime hours, the cumulative impacts of Alternative A and other cumulative projects would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. Due to the similarity of Alternatives B and C, cumulative impacts would be the same as discussed under Alternative B.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. As described above, potential parking impacts resulting from other cumulative projects would be less than significant. At the program level, the No Action Alternative would have a less-than-significant impact on area parking as vehicles associated with O&M activities would be accommodated within the Project Area. At the project level, the Phase 1 No Action would have the same effect on area parking for the same reason. As such, cumulative impacts resulting from the Phase 1 No Action and other cumulative projects would be less than significant.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. As described above, potential parking impacts resulting from other cumulative projects would be less than significant. The Phase 1 actions have the potential to increase parking demand as a result of the increase in recreational opportunities. As discussed in Section 3.12, Traffic, adequate parking is available to accommodate recreational users following implementation of the Phase 1 actions. With implementation of this mitigation measure, the effects of the Phase 1 actions would be less

than significant. Therefore, the cumulative impacts associated with the Phase 1 actions and other cumulative projects would be less than significant.

Phase 1 Actions Level of Significance: Less than Significant

Cumulative Impact 3.12-4: **Potential increase in wear and tear on the designated haul routes during construction.**

Alternative A. The development of cumulative projects, specifically large-scale residential, commercial, and industrial development as well as restoration and flood control projects, would involve construction activities that necessitate the transportation of equipment, machinery, soils, and workers to and from the work sites. 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, which consist primary of larger roads capable of handling heavy loads. The increase in truck trips could increase wear and tear on local and regional roadways. While 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.

Because the No Action Alternative would not involve construction of new facilities or features within the pond complexes, 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. While Alternative A would not contribute to cumulative impacts, the cumulative impacts associated with Alternative A and other cumulative projects would be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As discussed above, the potential impacts on roadway conditions from cumulative construction projects would be potentially significant. As discussed in Section 3.12, Traffic, Alternative B has the potential to contribute to wear and tear of designated roadways and as such, mitigation measures would be required to reduce these potential effects. With implementation of SBSP Mitigation Measure 3.12-4, the effects of Alternative B would be less than significant. While Alternative B would have a less-than-significant impact, the cumulative impacts of Alternative B and other cumulative projects would be potentially significant.

Alternative B Level of Significance: Potentially Significant

Alternative C. Due to the similarity of Alternatives B and C, cumulative impacts would be the same as discussed under Alternative B.

Alternative C Level of Significance: Potentially Significant

Phase 1 No Action. The potential impacts roadway conditions from cumulative construction projects would be potentially significant. At the program level, Alternative A would not generate construction-related traffic. At the project level, the Phase 1 No Action would also not involve construction of new facilities or features within the Phase 1 ponds and no construction-related traffic would be generated. As such, no increase in wear and tear on the designated haul routes would occur during construction. While the Phase 1 No Action would not contribute to cumulative impacts, the cumulative impacts of the Phase 1 No Action and other cumulative projects would be potentially significant.

Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 Actions. As described above, the potential impacts on roadway conditions from cumulative construction projects would be potentially significant. At the project level, the Phase 1 actions would generate limited construction-related traffic that would occur for up to six months. This incremental increase in construction-related traffic would be less than significant. While the Phase 1 actions would result in a less-than-significant contribution to cumulative impacts, cumulative impacts of the Phase 1 actions and other cumulative projects would be potentially significant.

Phase 1 Actions Level of Significance: Potentially Significant

---

Noise

Cumulative Impact 3.13-1: **Short-term construction noise effects.**

Alternative A. The development of future cumulative projects, specifically large-scale residential, commercial, and industrial development as well as restoration and flood control projects, would involve construction activities that generate noise. Because noise attenuates with distance, the context in which noise is evaluated is in the vicinity of the SBSP Restoration Project Area where nearby sensitive receptors could be disturbed. Projects in the Project Area vicinity including the flood control projects within the Shoreline Study area, other cumulative projects within the Project Area (*e.g.*, the PG&E Pond A6 Tower and Boardwalk Modification Project), and recreation and flood control projects adjacent to the Project Area, could generate noise that would have effects on the same sensitive receptors affected by the SBSP Restoration Project. Construction equipment noise can be as high as 102 dBA at 50 ft if piledriving occurs, and could disturb surrounding land uses and exceed noise standards of local jurisdictions if noise control devices are not installed and construction activities occur during the more sensitive nighttime hours. Construction activities typically occur during the daytime hours, and most jurisdictions exempt construction noise levels during designated hours. Because project proponents are required to comply with the requirements of noise regulations of affected jurisdictions, and exemptions are provided specifically for construction noise, potential noise effects during construction of cumulative projects would be less than significant.

Because the No Action Alternative would not involve construction of new facilities or features within the Project Area, no construction-related noise would be generated. As such, this alternative would not

contribute to cumulative impacts. The cumulative impacts of Alternative A and other cumulative projects would be less than significant.

Alternative A Level of Significance: Less than Significant

Alternative B. As discussed above, potential cumulative noise effects during construction from cumulative projects would be less than significant. As described in Section 3.13, Noise, Alternative B has the potential to exceed noise standards and disturb sensitive receptors. However, with implementation of SBSP Mitigation Measure 3.13-1, Alternative B's contribution to cumulative impacts would be less than significant. Therefore, cumulative noise impact resulting from the simultaneous construction of Alternative B and other cumulative projects would be less than significant because the projects are dispersed throughout the South Bay and noise levels attenuate over distance.

Alternative B Level of Significance: Less than Significant

Alternative C. Due to the similarity of Alternatives B and C, cumulative impacts would be the same as discussed under Alternative B.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. At the program level, Alternative A would not contribute to cumulative impacts because no construction noise would be generated. At the project level, the Phase 1 No Action would not generate construction noise because no construction is proposed at the Phase 1 ponds. As such, the Phase 1 No Action would not contribute to cumulative impacts. Therefore, the cumulative impacts of Alternative A and other cumulative projects would be less than significant.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. As described above, the potential impact associated with construction noise effects from cumulative construction projects would be less than significant. The Phase 1 actions would generate noise during construction activities that would occur for up to six months. During construction, noise levels could be exceeded and sensitive receptors could be disturbed. With the implementation of SBSP Mitigation Measure 3.13-1, the effects of the Phase 1 actions, and their contribution to cumulative impacts, would be less than significant. Therefore, cumulative noise impact resulting from the simultaneous construction of the Phase 1 actions and other cumulative projects would be less than significant because the projects are dispersed throughout the South Bay and noise levels attenuate over distance.

Phase 1 Actions Level of Significance: Less than Significant

Cumulative Impact 3.13-2: **Traffic-related noise impacts during construction.**

Alternative A. As described in Cumulative Impact 3.12-1 above, 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 generate traffic-related noise. Traffic noise would be spread out geographically throughout the South Bay and would be concentrated along the haul routes. In addition, construction-related traffic, and thus traffic-related noise, would be scattered throughout the 50-year planning period as projects come online and throughout daytime hours as construction progresses. Construction-related traffic would occur primarily along highways, although it is possible that such traffic would pass through residential areas. As described above, because noise attenuates with distance, the context in which traffic noise is evaluated is in the vicinity of nearby sensitive receptors along the routes. Because the haul routes that would be used for the cumulative projects are not known, effects on nearby sensitive receptors cannot be evaluated. Consequently, traffic noise impacts associated with cumulative projects would be potentially significant.

Because the No Action Alternative would not involve construction of new facilities or features within the Project Area, no construction traffic would be generated. As such, Alternative A would not contribute to cumulative traffic-related noise effects. However, the cumulative impacts of Alternative A and other cumulative projects would be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As discussed above, traffic noise impacts associated with cumulative projects would be potentially significant. As described in Section 3.13, Noise, Alternative B has the potential to result in significant traffic noise impacts. However, with implementation of SBSP Mitigation Measure 3.13-2, such impacts would be reduced to less-than-significant levels. Consequently, the contribution of traffic noise impacts under Alternative B to cumulative impacts would be less than significant. While the effects of Alternative B would be less than significant, the cumulative impacts of Alternative B and other cumulative projects would be potentially significant.

Alternative B Level of Significance: Potentially Significant

Alternative C. Due to the similarity of Alternatives B and C, cumulative impacts would be the same as discussed under Alternative B.

Alternative C Level of Significance: Potentially Significant

Phase 1 No Action. As discussed above, traffic noise impacts associated with cumulative projects would be potentially significant. At the program level, Alternative A would not involve construction of new facilities, and no construction traffic would be generated. At the project level, the Phase 1 No Action would not generate construction-related traffic noise and as such, would not contribute to cumulative traffic-related noise effects. While no traffic-related noise impacts would occur under the Phase 1 No

Action, the cumulative impacts of the Phase 1 No Action and other cumulative projects would be potentially significant.

Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 Actions. As described above, traffic-related construction noise impacts associated with cumulative projects would be potentially significant. At the program level, Alternatives B and C would result in potentially significant traffic-noise impacts. At the project level, the Phase 1 actions would also result in potentially significant traffic-noise impacts. However, with implementation of SBSP Mitigation Measure 3.13-2, these noise impacts would be reduced to less-than-significant levels. While the contribution from the Phase 1 actions would be less than significant, the cumulative impacts of the Phase 1 actions and other cumulative projects would be potentially significant.

Phase 1 Actions Level of Significance: Potentially Significant

---

Cumulative Impact 3.13-3: **Traffic-related noise effects during operation.**

Alternative A. As described in the cumulative setting, the population of the South Bay is expected to increase over the next 25 years, and it is anticipated that this trend will continue over the 50-year planning period for the SBSP Restoration Project. This increase would result in a corresponding increase in long-term traffic volumes, which in turn would cause an increase in traffic-related noise. The cumulative context in which traffic-related noise effects during operation is a concern is within or around the SBSP Restoration Project Area where sensitive receptors would be affected. The cumulative projects that may affect operational traffic noise include recreation restoration and flood control projects (including the ELER Restoration Project and the Shoreline Study) that could provide recreational opportunities in the vicinity of the Project Area. Although the traffic volume increase over the long term is not known, because traffic-related noise effects resulting from travel to and from the recreation sites would occur primarily during the weekend daytime hours (non-sensitive noise hours) and would be dispersed along multiple access routes throughout the South Bay, the operational traffic-related effects from cumulative projects would be less than significant.

As described in SBSP Impact 3.13-3 in Section 3.13, Noise, the No Action Alternative would result in limited traffic-related noise from O&M activities. As no new recreational facilities are proposed, traffic-related noise effects associated with traveling to and from recreation sites would be less than significant. Consequently, Alternative A would contribute minimally to cumulative traffic-related noise impacts. The potential for sensitive receptors to be affected by operational traffic-related noise effects from Alternative A and other cumulative projects would be limited because traffic would be dispersed throughout the South Bay, along multiple access routes, and traffic would occur primarily during the daytime hours. Therefore, the cumulative impacts of Alternative A and other cumulative projects would be less than significant.

Alternative A Level of Significance: Less than Significant

Alternative B. As described above, the operational traffic-related impacts from cumulative projects would be less than significant. Because it is expected that the increase in traffic associated with Alternative B (primarily from increased traffic volumes associated with increased recreational opportunities) would mainly be concentrated during the daytime, non-sensitive noise hours, and would likely dispersed along multiple access routes throughout the South Bay, the contribution of Alternative B to cumulative long-term traffic-related noise impacts would be less than significant. Similarly, the potential for sensitive receptors to be affected by operational traffic-related noise effects from Alternative B and other cumulative projects would be limited because traffic would be dispersed throughout the South Bay, along multiple access routes, and traffic would occur primarily during the daytime hours. Therefore, the cumulative impacts of Alternative B and other cumulative projects would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. Due to the similarity of Alternatives B and C, cumulative impacts would be the same as discussed under Alternative B.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. As described above, the operational traffic-related impacts from cumulative projects would be less than significant. At the program level, Alternative A would have less than significant traffic noise impacts resulting from O&M activities. At the project level, the Phase 1 No Action would result in less than significant traffic-related noise impacts from O&M activities at Phase 1 ponds. As such, the Phase 1 No Action would contribute minimally to cumulative traffic-related noise effects. The potential for sensitive receptors to be affected by operational traffic-related noise effects from the Phase 1 No Action and other cumulative projects would be limited because traffic would be dispersed throughout the South Bay, along multiple access routes, and traffic would occur primarily during the daytime hours. Therefore, the cumulative impacts of the Phase 1 No Action and other cumulative projects would be less than significant.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. As described above, traffic-related operational noise impacts associated with cumulative projects would be less than significant. At the program level, Alternative B would result in less than significant operational traffic-related noise impacts. At the project level, the Phase 1 actions would also result in less than significant operational traffic-related noise impacts. Consequently, the contribution of traffic-related noise impacts under the Phase 1 actions to cumulative impacts would be less than significant. The potential for sensitive receptors to be affected by operational traffic-related noise effects from the Phase 1 actions and other cumulative projects would be limited because traffic would be dispersed throughout the South Bay, along multiple access routes, and traffic would occur primarily during the daytime hours. Therefore, the cumulative impacts of the Phase 1 actions and other cumulative projects would be less than significant.

Phase 1 Actions Level of Significance: Less than Significant

Cumulative Impact 3.13-4: **Potential operational noise effects from pump operation and other O&M activities.**

Alternative A. As described in the cumulative setting, the population of the South Bay is expected to increase over the next 25 years, and it is reasonable to assume that this trend will continue throughout the planning period for the SBSP Restoration Project. The simultaneous development and operation of cumulative projects, particularly residential, commercial, and industrial projects, as well as recreation projects, would generate noise. In the cumulative context, noise is a concern in the SBSP Restoration Project Area vicinity where sensitive noise receptors could be affected. As noted in Section 3.13, noise attenuates with distance, so noise generated from cumulative projects throughout the South Bay would not necessarily affect the same sensitive receptors (*e.g.*, noise generated by a project near the Eden Landing pond complex would not affect sensitive receptors near the Alviso pond complex). Each local jurisdiction near the Project Area has adopted noise regulations which set maximum noise levels for various land uses during day and nighttime hours. New development projects must be designed to comply with these regulations. Because of these restrictions, operational noise impacts resulting from the cumulative projects would be less than significant.

As described in Section 3.13, Noise, the No Action Alternative would result in minor, intermittent noise from O&M activities over the 50-year planning period. As such, the contribution of Alternative A to cumulative operational noise effects would be less than significant. The potential for sensitive receptors to be affected by O&M activities under Alternative A as well as other cumulative projects would be limited because the projects are dispersed throughout the South Bay and noise levels attenuate over distance. Therefore, the cumulative impacts of Alternative A and other cumulative projects would be less than significant.

Alternative A Level of Significance: Less than Significant

Alternative B. As described above, the operational noise effects from other cumulative projects would be less than significant. Alternative B would generate noise associated with new recreational uses and operation of both portable diesel-powered and electric pumps. Noise from new recreational uses would not be considered significant, but noise generated by the pumps would require mitigation (SBSP Mitigation Measure 3.13-4) to reduce potential noise impacts to less-than-significant levels.

As with Alternative A, the potential for sensitive receptors to be affected by Alternative B and other cumulative projects would be limited because the projects are dispersed throughout the South Bay and noise levels attenuate over distance. Therefore, the cumulative impacts of Alternative B and other cumulative projects would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. Due to the similarity of Alternatives B and C, cumulative impacts would be the same as discussed under Alternative B.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. As discussed above, the No Action Alternative would result in minimal operational noise from O&M activities. At the project level, the Phase 1 No Action would contribute minimally to cumulative operational noise effects. Consequently, the cumulative impacts of the Phase 1 No Action and other cumulative projects would be less than significant.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. As discussed above, operational noise impacts associated with cumulative projects would be less than significant. The Phase 1 actions would include operation of pumps, and SBSP Mitigation Measure 3.13-4 would be required to reduce noise impacts to less than significant levels. The effects of the Phase 1 actions would be less than significant with implementation of this mitigation measure. As such, the cumulative impacts of the Phase 1 actions and other cumulative projects would be less than significant.

Phase 1 Actions Level of Significance: Less than Significant

Cumulative Impact 3.13-5: **Potential vibration effects during construction and/or operation.**

Alternative A. The construction of cumulative projects, including residential, commercial, industrial, restoration, flood control and recreation projects, has the potential to result in cumulative vibration effects, particularly if these projects include piledriving activities, which generate the highest vibration impacts compared to the use of other equipment. Vibration effects are a potentially significant impact if they result in potential damage to structures or disturbance to people. In the cumulative context, vibration is a concern in the Project Area vicinity where structures would be damaged. Construction and O&M activities of cumulative projects may result in the use of construction equipment that generates significant vibration levels, depending on the work conducted. It is unknown whether the other cumulative projects would require piledriving and other vibration-generating construction activities. For the purposes of this analysis, potential vibration impacts associated with other cumulative projects would be potentially significant.

Because O&M activities under Alternative A would not exceed vibration standards, it would contribute minimally to cumulative vibration effects. While the effects of Alternative A would be less than significant, the cumulative noise impacts resulting from the simultaneous operation of Alternative A and other cumulative projects would be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As discussed above, vibration impacts associated with other cumulative projects would be potentially significant. Alternative B would require the use of piledrivers and other equipment during construction activities that would generate vibration. Because Alternative B would not exceed any vibration standards, its contribution to cumulative vibration effects would be minimal. While the effects

of Alternative B would be less than significant, the cumulative impacts resulting from the simultaneous implementation of Alternative B and other cumulative projects would be potentially significant.

Alternative B Level of Significance: Potentially Significant

Alternative C. Due to the similarity of Alternatives B and C, the cumulative impacts would be the same as discussed under Alternative B.

Alternative C Level of Significance: Potentially Significant

Phase 1 No Action. As discussed above, vibration impacts associated with other cumulative projects would be potentially significant. At the program level, Alternative A would result in minimal vibration effects from O&M activities. At the project level, the Phase 1 No Action would also result in minimal vibration effects from O&M activities at the Phase 1 ponds. Consequently, the contribution of the Phase 1 No Action to cumulative vibration impacts would be less than significant. While the effects of the Phase 1 No Action would be less than significant, the cumulative impacts of the Phase 1 No Action and other cumulative projects would be potentially significant.

Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 Actions. As described above, vibration impacts associated with other cumulative projects would be potentially significant. Under the Phase 1 actions, piledriving and other activities would generate vibration effects. Because the Phase 1 actions would not exceed any vibration standards, their contribution to cumulative vibration effects would be less than significant. While the effects of the Phase 1 actions would be less than significant, the cumulative impacts of the Phase 1 actions and other cumulative projects would be potentially significant.

Phase 1 Actions Level of Significance: Potentially Significant

---

Air Quality

Cumulative Impact 3.14-1: **Short-term construction-generated air pollutant emissions.**

Alternative A. The simultaneous construction of cumulative projects, including residential, commercial, industrial, restoration, flood control, and recreation projects would generate air pollutant emissions. As described in Section 3.14, Air Quality, the BAAQMD has no mass emission thresholds for construction emissions of ROG and NO_x and bases its determination of significance for construction emissions on consideration of the dust control measures to be implemented (BAAQMD 1999). Also, the BAAQMD's approach to CEQA analyses of construction-generated fugitive PM_{10} dust emissions is to require implementation of effective and comprehensive control measures rather than a detailed quantification of construction emissions. The BAAQMD requires that all feasible control measures, which are dependent on the size of the construction area and the nature of the construction activities involved, shall be incorporated into project design or implemented during project construction. All construction projects

would be required to implement these control measures, which are identified in SBSP Mitigation Measure 3.14-1 in this EIS/R. The implementation of required construction emission controls and BMPs by all project proponents would ensure that cumulative air quality impacts from other cumulative projects would be less than significant.

As described in SBSP Impact 3.14-1 in Section 3.14, Air Quality, because the No Action Alternative would not involve construction of new facilities or features within the Project Area, no construction-related air pollutant emissions would be generated. As such, this alternative would not contribute to cumulative impacts. Therefore, the cumulative impacts of Alternative A and other cumulative projects would be less than significant.

Alternative A Level of Significance: Less than Significant

Alternative B. As described above, air quality impacts from other cumulative projects would be less than significant. As described in SBSP Impact 3.14-1, Alternative B would involve construction activities that would generate air pollutant emissions. However, with implementation of SBSP Mitigation Measure 3.14-1, potential impacts under Alternative B would be reduced to less-than-significant levels. Alternative B's contribution to cumulative impacts would be less than significant. The cumulative air quality impacts resulting from Alternative B and other cumulative projects would be less than significant, as all project proponents would be required to implement construction emission controls and BMPs.

Alternative B Level of Significance: Less than Significant

Alternative C. Due to the similarity of Alternatives B and C, the cumulative impacts would be the same as discussed under Alternative B.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. As discussed above, air quality impacts from other cumulative projects would be less than significant. At the program level, Alternative A would not result in air pollutant emissions as no construction would occur. At the project level, the Phase 1 No Action would not involve construction of new facilities or features within the Phase 1 ponds and no construction air pollutant emissions would be generated. As such, the Phase 1 No Action would not contribute to cumulative impacts. The cumulative impacts resulting from Alternative A and other cumulative projects would be less than significant.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. As described above, construction air quality impacts from cumulative construction projects would be less than significant. The Phase 1 actions would generate air pollutants during construction activities. Implementation of SBSP Mitigation Measure 3.14-1 would be required to reduce potential effects to less-than-significant levels. With the implementation of the mitigation measure, the effects of the Phase 1 actions, and thus their contribution to cumulative impacts, would be less than significant. Therefore, cumulative air quality impacts associated with the Phase 1 actions and other

cumulative projects would also be less than significant, as all project proponents would be required to implement construction emission controls and BMPs.

Phase 1 Actions Level of Significance: Less than Significant

Cumulative Impact 3.14-2: **Potential long-term operational air pollutant emissions.**

Alternative A. The operation of other large-scale cumulative projects, particularly residential, commercial and industrial projects, has the potential to increase air emissions associated with increases in the vehicles miles traveled. CARB and the BAAQMD have taken into account air emissions related to anticipated population growth and planned development, thus capturing the expected impacts associated with the implementation of cumulative projects. Given the restrictions and standards required by these agencies, potential impacts for the other cumulative projects would be less than significant.

The No Action Alternative would consist of limited O&M activities that have the potential to generate operational emissions. However, the emissions generated by limited and intermittent O&M activities would be less than significant (see SBSP Impact 3.14-2 in Section 3.14). Similarly, the contribution to cumulative impacts of Alternative A would be less than significant. Therefore, the cumulative impacts of Alternative A and other cumulative projects would be less than significant.

Alternative A Level of Significance: Less than Significant

Alternative B. As described above, operational air quality impacts resulting from the other cumulative projects would be less than significant. As described in Section 3.14, Air Quality, Alternative B would involve minimal O&M activities, operation of portable diesel-powered pumps, and would increase long-term traffic associated with new recreation opportunities. However, the potential long-term operational air pollutant air emissions under Alternative B would be less than significant because operation would not exceed the state agencies' air quality standards. Similarly, the contribution to cumulative impacts of Alternative B would be less than significant. The cumulative impacts of Alternative B and other cumulative projects would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. Due to the similarity of Alternatives B and C, the cumulative impacts would be the same as discussed under Alternative B.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. As described above, operational air quality impacts resulting from the other cumulative projects would be less than significant. At the program level, Alternative A would involve limited O&M activities that have the potential to generate operational emissions. At the project level, the Phase 1 No Action also would consist of limited O&M activities at the Phase 1 ponds that have the potential to generate operational emissions. However, the emissions generated by limited and intermittent

O&M activities would be minimal. Similarly, due to the above reasons, its contribution to cumulative impacts would be less than significant. The cumulative impacts of the Phase 1 No Action and other cumulative projects would be less than significant due to the state agencies' restrictions and standards.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. As described above, operational air quality impacts resulting from the other cumulative projects would be less than significant. The Phase 1 actions would involve the use of electric pumps that are permitted to ensure that they would not generate significant air pollutants during operation. As such, the effects of the Phase 1 actions, and their contribution to cumulative effects, would be less than significant. Therefore, the cumulative impacts of the Phase 1 actions and other cumulative projects would be less than significant.

Phase 1 Actions Level of Significance: Less than Significant

Cumulative Impact 3.14-3: **Potential exposure of sensitive receptors to toxic air contaminant (TAC) emissions.**

Alternative A. The construction of cumulative projects, particularly large-scale residential, commercial, and industrial development as well as restoration and recreation projects, would require the use of construction equipment that has the potential to generate TAC emissions. As described in Section 3.14, Air Quality, construction equipment emissions would be reduced over time to comply with USEPA's Final Rule promulgated in January 2001 to reduce emission standards for 2007 and subsequent model year heavy-duty diesel engines as well as with CARB's Tier 4 emission standards. However, as all construction activities would result in the use of diesel-powered equipment that has the potential to generate TAC emissions, potential exposure of sensitive receptors to TAC emissions would be potentially significant for cumulative projects.

Under the No Action Alternative, no construction activities would occur within the Project Area, although O&M activities would require the use of construction equipment. The use of this equipment would be limited in extent and occur intermittently over the 50-year planning period. The potential for exposure of sensitive receptors to TAC emissions from use of construction-equipment that generates TACs would be minimal (see SBSP Impact 3.14-3). As such, the effects of Alternative A would be less than significant. While the effects of Alternative A would be less than significant, the cumulative impacts of Alternative A and other cumulative projects would be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As discussed above, the potential for exposure of sensitive receptors to TAC emissions would be potentially significant for cumulative projects. As described in Impact SBSP Impact 3.14-3, Alternative B would involve the use of diesel-powered construction equipment and portable pumps. Impacts associated with Alternative B would be potentially significant and would require implementation

of Mitigation Measure 3.14-3 to reduce potential impacts. With implementation of this mitigation measure, the contribution of Alternative B to cumulative impacts would be less than significant. While the effects of Alternative B would be less than significant, the cumulative impacts of Alternative B and other cumulative projects would be potentially significant.

Alternative B Level of Significance: Potentially Significant

Alternative C. Due to the similarity of Alternatives B and C, the cumulative impacts would be the same as discussed under Alternative B.

Alternative C Level of Significance: Potentially Significant

Phase 1 No Action. The potential for exposure of sensitive receptors to TAC emissions would be potentially significant for cumulative projects. At the program level, Alternative A would require the intermittent use of diesel-powered equipment over the 50-year planning period. At the project level, the Phase 1 No Action also would require the intermittent use of diesel-powered equipment over the 50-year planning period at the Phase 1 ponds. As discussed above, the contribution to cumulative impacts from the No Action Alternative would be less than significant. While the effects of the Phase 1 No Action would be less than significant, the cumulative impacts of the Phase 1 No Action and other cumulative projects would be potentially significant.

Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 Actions. As discussed above, the potential for exposure of sensitive receptors to TAC emissions would be potentially significant for cumulative projects. The Phase 1 actions would require implementation of Mitigation Measure 3.14-3 to reduce the potential for TAC exposure to sensitive receptors. With the implementation of this mitigation measure, the contribution of the Phase 1 actions to cumulative impacts would be less than significant. While the effects of the Phase 1 actions would be less than significant, the cumulative impacts of the Phase 1 actions and other cumulative projects would be potentially significant.

Phase 1 Actions Level of Significance: Potentially Significant

---

Cumulative Impact 3.14-4: **Potential odor emissions.**

Alternative A. Cumulative projects with the potential to generate odors include wastewater, landfill, and restoration projects. Other cumulative projects are not expected to generate odors. The proximity of these projects to the same sensitive receptors could result in potential odor emissions. Odor-generating facilities currently exist in the SBSP Restoration Project Area vicinity. Any expansion of these facilities could increase odor generation. However, these odors already occur. In addition, construction activities of cumulative projects (*e.g.*, development, flood control, and recreation projects) have the potential to increase odors from operation of diesel-powered equipment and dredging of fill, but these odors dissipate quickly. Potential odor impacts from other cumulative projects would be less than significant.

As discussed in SBSP Impact 3.14-4, the potential for odors under the No Action Alternative is expected to continue, and would be less than significant since odor effects would not be substantially different from existing conditions. As such, the effects of Alternative A would be less than significant. Therefore, the cumulative impacts resulting from Alternative A and other cumulative projects would be less than significant.

Alternative A Level of Significance: Less than Significant

Alternative B. As discussed above, potential odor impacts from other cumulative projects would be less than significant. As described in Section 3.14, Air Quality, odors associated with Alternative B include construction activities (operation of diesel-powered equipment and dredging of fill, which would occur intermittently), and restoration of ponds (which is expected to improve air quality). As such, the effects of Alternative B would be less than significant. Therefore, the cumulative impacts of Alternative B and other cumulative projects would be less than significant due to the temporary nature of construction activities and the net benefit to air quality.

Alternative B Level of Significance: Less than Significant

Alternative C. Due to the similarity of Alternatives B and C, the cumulative impacts would be the same as discussed under Alternative B.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. As described above, potential odor impacts from other cumulative projects would be less than significant. At the program level, the potential for odors is expected to continue under the No Action Alternative, and would be less than significant since odor effects would not be substantially different from existing conditions. At the project level, the potential for odors is not expected to substantially change at the Phase 1 ponds. Consequently, the contribution of the Phase 1 No Action to cumulative impacts would be less than significant. The cumulative impacts of Alternative A and other cumulative projects would be less than significant because odor emissions are part of the existing condition.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. As described above, potential odor impacts from other cumulative projects would be less than significant. The Phase 1 actions would require the use of diesel-powered equipment and dredging of fill which would generate odors; however, these activities would occur intermittently and odors would dissipate quickly. Consequently, the effects of the Phase 1 actions would be less than significant. The cumulative impacts of the Phase 1 actions and other cumulative projects would be less than significant due to the temporary nature of construction activities and the net benefit to air quality.

Phase 1 Actions Level of Significance: Less than Significant

Public Services

Cumulative Impact 3.15-1: **Increased demand for fire and police protection services.**

Alternative A. The development and operation of 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 in keeping with their service ratio goals. Based on this response, municipalities plan for future growth to ensure that sufficient services are provided. Therefore, impacts on fire and police protection services from cumulative projects would be less than significant.

As described in SBSP Impact 3.15-1, in Section 3.15, Public Services, the No Action Alternative would not involve any changes that would increase demand for fire and police protection services. As such, it would not contribute to cumulative impacts. The cumulative impacts of Alternative A and other cumulative projects would be less than significant.

Alternative A Level of Significance: Less than Significant

Alternative B. As described above, impacts on fire and police protection services resulting from cumulative projects would be less than significant. As described in Section 3.15, Public Services, Alternative B would involve the construction of recreational features which would increase recreational opportunities, and could increase demand for police and fire services during emergencies. However, Alternative B is not expected to result in an increase in demand for these services such that it would outpace planned growth. As such, Alternative B would contribute minimally to cumulative impacts. Therefore, the cumulative impacts of Alternative B and other cumulative projects would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. Due to the similarity of Alternatives B and C, the cumulative impacts would be the same as discussed under Alternative B.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. As described above, impact on fire and police services resulting from other cumulative projects would be less than significant. At the program level, no changes are anticipated under Alternative A that would increase demand for fire and police protection services. At the project level, the Phase 1 No Action also would not involve any changes that would increase demand for fire and police protection services from operation of the Phase 1 ponds. Consequently, no impacts would occur under the Phase 1 No Action. The cumulative impacts of the Phase 1 No Action and other cumulative projects would be less than significant.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. As described above, the potential impacts on fire and police services resulting from other cumulative projects would be less than significant. The Phase 1 actions are not expected to result in an increase in demand for public services such that it would outpace planned growth. Consequently, Phase 1 actions would contribute minimally to cumulative impacts. The cumulative impacts of the Phase 1 actions and other cumulative projects would be less than significant.

Phase 1 Actions Level of Significance: Less than Significant

Utilities

Cumulative Impact 3.16-1: **Reduced ability to access PG&E towers and stations or electrical transmission lines.**

Alternative A. 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 power towers and may result in reduced PG&E access. Other recent and proposed tidal wetland restoration projects that would contribute incrementally to potential impacts are the Moseley Tract restoration, Cooley Landing salt pond restoration, Eden Landing Ecological Reserve restoration, Stevens Creek wetland restoration, and possibly Pond A18, depending on the outcome of the City of San Jose's land use planning process (in progress). The number of power 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. There are additional tidal habitat restoration sites (*e.g.*, Coyote Creek Lagoon) where towers occur, but the towers can be accessed by road and are surrounded by an upland area that provides a buffer between the area of maintenance activity and habitat for threatened or endangered species. 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.

Successful implementation of the HCP by PG&E is expected to lessen this impact in all nine of the Bay Area counties by setting agreed-upon avoidance and mitigation measures, identifying appropriate compensation for "take" of species, and providing an institutional structure for training and monitoring. The HCP is currently under development and the extent to which implementation of the HCP will lessen this impact is not known.

Under Alternative A, most of the ponds within the SBSP Restoration Project Area which contain PG&E towers would likely be maintained as seasonally managed ponds. This would limit the extent of salt marsh and reductions to access due to threatened or endangered species in the areas of highest concentration of PG&E towers and stations. One exception is Pond A6, which is expected to be tidal

habitat under Alternative A. Alternative A's contribution to cumulative impacts would be less than significant.

Therefore, the cumulative impacts of Alternative A and the other tidal wetland restoration projects would result in a less-than-significant reduction in access to PG&E facilities in the South Bay.

Alternative A Level of Significance: Less than Significant

Alternative B. As described above for Alternative A, other recent and planned tidal habitat restoration would not significantly reduce access to PG&E towers in the South Bay. Although Alternative B would create more habitat for threatened and endangered species than Alternative A, continued coordination between PG&E and the landowners (USFWS and CDFG) at the project level and successful implementation of the HCP currently under development would reduce this impact to a less-than-significant level (see SBSP Impact 3.16-1 in Section 3.16, Utilities). Therefore, the cumulative impacts of Alternative B and other cumulative projects would result in a less-than-significant reduction in access to PG&E facilities in the South Bay.

Alternative B Level of Significance: Less than Significant

Alternative C. The cumulative impacts associated with Alternative C would be similar to those described for Alternative B.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. As described above for Alternative A, other recent and planned tidal habitat restoration would not significantly reduce access to PG&E towers in the South Bay. Successful implementation of the HCP would lessen impacts associated with access to PG&E facilities in the nine Bay Area counties. The Phase 1 No Action contribution to impacts would be small, as described in Phase 1 Impact 3.16-1. The cumulative impact of the Phase 1 No Action, other cumulative projects, and the HCP currently under development, would result in a less-than-significant cumulative impact related to reduction in access.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. The cumulative impacts associated with the Phase 1 actions would be similar to those described for Phase 1 No Action.

Phase 1 Actions Level of Significance: Less than Significant

Cumulative Impact 3.16-2: **Reduced clearance between waterways and PG&E electrical transmission lines.**

Alternative A. Water levels are expected to increase within the tidally-restored ponds due to sea level rise (see Appendix J, Hydrodynamic Modeling Report). Other tidal wetland restoration projects would also alter the water surface elevations in ponds with overhead electrical transmission lines outside of the SBSP Restoration Project Area, but these modifications are expected to be localized. Other types of cumulative projects are not expected to contribute to reduced clearance between waterways and PG&E electrical transmission lines. Although sea level rise would affect the clearance between the waterways and transmission lines, cumulative projects would not in combination affect clearance between waterways and transmission lines within the SBSP Restoration Project Area.

As described previously (SBSP Impact 3.16-2), USFWS would continue to prohibit public boating in restored areas except where it is expressly allowed for waterfowl hunting and CDFG can prohibit boating in breached ponds where line clearances are less than required by the California Public Utilities Commission. As such, Alternative A's contribution to cumulative impacts related to reduced clearance between waterways and PG&E electrical transmission lines would be less than significant given this restriction. The cumulative impacts of Alternative A and other cumulative projects would be less than significant even with sea level rise.

Alternative A Level of Significance: Less than Significant

Alternative B. As described above, other tidal wetland projects are not expected to affect water surface elevations or line clearances within the SBSP Restoration Project Area. Although more ponds within the SBSP Restoration Project Area would be restored to tidal action under Alternative B, the cumulative impacts of Alternative A would be similar to those described for Alternative A. USFWS would continue to prohibit public boating in tidal habitats except where it is expressly allowed for waterfowl hunting. CDFG would restrict or prohibit public boating within restored areas as necessary. The cumulative impacts of Alternative B and other cumulative projects would be less than significant even with sea level rise.

Alternative B Level of Significance: Less than Significant

Alternative C. The cumulative impacts associated with Alternative C would be similar to those described for Alternative B.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. As described above, other tidal wetland projects are not expected to affect water surface elevations or line clearances within the SBSP Restoration Project Area. Pond A6 in the Alviso pond complex and Pond SF2 in the Ravenswood pond complex are the only Phase 1 ponds containing overhead transmission lines. In the absence of Phase 1 actions, line clearances are not expected to be reduced, as discussed for the Phase 1 Impact 3.16-2 in Section 3.16, Utilities, even with sea level rise, and the Phase 1 actions' contribution to cumulative impacts would be less than significant. Therefore, the

cumulative impacts of the Phase 1 No Action and other cumulative projects would be less than significant.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. As described above, other tidal wetland projects are not expected to affect water surface elevations or line clearances within the SBSP Restoration Project Area. Under the Phase 1 actions, Pond A6 would be the only pond restored to tidal habitat that has overhead transmission lines (Pond SF2 would be maintained as a managed pond, as under the No Action scenario). Therefore, the cumulative impacts of the Phase 1 actions would be similar to that described for Phase 1 No Action above. The cumulative impacts of Phase 1 actions and other cumulative projects would be less than significant even with sea level rise.

Phase 1 Actions Level of Significance: Less than Significant

Cumulative Impact 3.16-3: **Reduced structural integrity of PG&E towers.**

Alternative A. Increased tidal scour and corrosion from exposure to saline water have the potential to reduce the structural integrity of PG&E towers. Other tidal wetland restoration projects are not expected to affect tidal hydrodynamics within the SBSP Restoration Project Area. Other types of cumulative projects would also not contribute to reduced structural integrity of PG&E towers.

The Pond A6 Tower and Boardwalk Modification Project (currently underway) would protect the structural integrity of PG&E towers in Pond A6, in the event of breaching. Alternative A would impact the structural integrity of PG&E towers at other locations within the SBSP Restoration Project Area since seasonal and managed ponds with existing PG&E towers (*e.g.*, Ponds R1, R2, and SF2 in the Ravenswood pond complex and Ponds A2W through A3N in the Alviso pond complex) would be subject to intermittent tidal inundation or overtopping before failed levees were repaired. As such, Alternative A's contribution to cumulative impacts related to reduced structural integrity of PG&E towers would be potentially significant, and the cumulative impact of Alternative A and other tidal wetland restoration projects would be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. Other tidal wetland restoration projects are not expected to affect the structural integrity of PG&E towers within the SBSP Restoration Project Area. Under Alternative B, planning and design for each phase of implementation would continue to be coordinated with PG&E to evaluate the potential reduction in structural integrity of PG&E towers and to allow PG&E to provide adequate improvements as necessary. Alternative B's contribution to cumulative impacts would be less than significant. Therefore, the cumulative impacts of Alternative B and other cumulative projects would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. The cumulative impacts associated with Alternative C would be identical to those described for Alternative B.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. Other wetland restoration projects would not affect the structural integrity of towers at the Phase 1 locations. The Pond A6 Tower and Boardwalk Modification Project that was recently completed is designed to protect the structural integrity of the towers at Pond A6. However, the Phase 1 No Action would have potentially significant impacts on the structural integrity of PG&E towers in Pond SF2 due to intermittent tidal inundation or overtopping before failed levees were repaired. As such, the Phase 1 No Action's contribution to cumulative impacts would be potentially significant. The cumulative impacts of the Phase 1 No Action and other cumulative projects would be potentially significant.

Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 Actions. Other wetland restoration projects would not affect the structural integrity of towers at the Phase 1 locations. The Pond A6 Tower and Boardwalk Modification Project that was recently completed is designed to protect the structural integrity of the towers at Pond A6. The Phase 1 actions would have less-than-significant impacts on the structural integrity of PG&E towers. As such, the Phase 1 actions' contribution to cumulative impacts would be less than significant. Therefore, the cumulative impacts of the Phase 1 actions and other cumulative projects would be less than significant.

Phase 1 Actions Level of Significance: Less than Significant

Cumulative Impact 3.16-4: **Changes in water level, tidal flow and sedimentation near storm drain systems.**

Alternative A. Only the Lower Guadalupe River Flood Protection Project would have the potential to affect storm drains in the SBSP Restoration Project Area. Other cumulative projects are not expected to affect storm drains in the SBSP Restoration Project Area. This completed project included modification to 19 storm drain outfalls upstream of the SBSP Restoration Project Area and ongoing vegetation management in the river channel near the Union Pacific Railroad bridge. This project has a beneficial effect on storm drain function in the lower Guadalupe River/Alviso Slough system.

Under Alternative A, unplanned breaches to ponds along Alviso Slough have the potential to raise low water elevations and therefore reduce the discharge capacity of gravity-driven storm drains in tidal portions of the lower Guadalupe River, reducing the level of benefit provided by the Lower Guadalupe River Flood Protection Project. The unplanned breaches assumed to occur under Alternative A in other portions of the SBSP Restoration Project Area would affect storm drains in the vicinity of those breaches, and storm drain improvements implemented as part of the Lower Guadalupe River Flood Protection Project would not offset adverse effects in these areas. Alternative A's contribution to cumulative

impacts to storm drains would be potentially significant. The cumulative impacts of Alternative A and other cumulative projects would therefore be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As described above, the Lower Guadalupe River Flood Protection Project provided a beneficial effect on storm drains in the lower Guadalupe River/Alviso Slough system. The planned levee breaches under Alternative B would occur after the potential for impacts to storm drains was evaluated during future project level analyses, and restoration actions would include measures to address poor drainage if necessary, resulting in a less than significant impact. The cumulative impacts of Alternative B and other cumulative projects would therefore be less than significant throughout most of the SBSP Restoration Project Area, with beneficial effects in the lower Guadalupe River/Alviso Slough system.

Alternative B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative C. The cumulative impacts associated with Alternative C would be identical to those described for Alternative B.

Alternative C Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Phase 1 No Action. As described above, the Lower Guadalupe River Flood Protection Project provided a beneficial effect on storm drains in the lower Guadalupe River/Alviso Slough system. Unplanned levee breaches at Phase 1 locations within the Eden Landing pond complex may raise low water elevations in Mt. Eden Creek and lower OAC, but no storm drains have been identified in this area. Additionally, unplanned levee breaches at Pond A6 would not likely result in changes to low water elevations in Alviso Slough given the proximity of the pond to the Bay. Therefore, Phase 1 No Action would have a negligible affect on the beneficial impacts of the Lower Guadalupe River Flood Protection Project. As such, Phase 1 No Action's contribution would be less than significant. The cumulative impacts of the Phase 1 No Action and other cumulative projects would be less than significant/beneficial.

Phase 1 No Action Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Phase 1 Actions. The cumulative impacts associated with the Phase 1 actions would be identical to those described for Phase 1 No Action.

Phase 1 Actions Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Cumulative Impact 3.16-5: **Changes in water level, tidal flow and sedimentation near pumping facilities.**

Alternative A. Vegetation removal upstream of the Union Pacific Railroad bridge, as part of the Lower Guadalupe River Flood Protection Project, reduces water elevations during high flow events and improves the discharge ability of the two stormwater lift stations upstream of the bridge. Other

cumulative projects are not expected to result in changes in water level, tidal flow and sedimentation near pumping facilities.

The unplanned breaches assumed under Alternative A would not contribute significantly to the cumulative impacts on these pumping facilities. Therefore, the cumulative impacts of Alternative A and other cumulative projects would be less than significant/beneficial.

Alternative A Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative B. The cumulative impacts under Alternative B would be identical to those described for Alternative A.

Alternative B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative C. The cumulative impacts under Alternative C would be identical to those described for Alternative A.

Alternative C Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Phase 1 No Action. As discussed above, activities associated with the Lower Guadalupe River Flood Protection Project reduce water elevations during high flow events and improve the discharge ability of the two stormwater lift stations upstream of the bridge. The Phase 1 No Action is not expected to significantly affect water levels, tidal flow or sedimentation near pumping facilities within the Lower Guadalupe River or the SBSP Restoration Project Area. Therefore, its contribution to cumulative impacts would be less than significant and the cumulative impacts of the Phase 1 No Action and other cumulative projects on pumping facilities would be less than significant/beneficial.

Phase 1 No Action Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Phase 1 Actions. The cumulative impacts associated with the Phase 1 actions would be identical to those described for Phase 1 No Action.

Phase 1 Actions Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Cumulative Impact 3.16-6: **Changes in water level, tidal flow and sedimentation near sewer force mains and outfalls.**

Alternative A. None of the currently identified projects would affect the hydrodynamics or sediment dynamics near sewer force mains. Therefore, cumulative projects would result in a less-than-significant cumulative impact on sewer force mains and outfalls. As discussed in SBSP Impact 3.16-6 in Section 3.16, Alternative A would result in a less-than-significant impact on these facilities. Its contribution to cumulative impacts would similarly be less than significant, and cumulative impacts of Alternative A and other cumulative projects would be less than significant.

Alternative A Level of Significance: Less than Significant

Alternative B. As described above, none of the currently identified projects would affect the hydrodynamics or sediment dynamics near sewer force mains. Alternative B's contribution to cumulative impacts would be less than significant (see SBSP Impact 3.16-8 in Section 3.16). The cumulative impacts of Alternative B and other cumulative projects would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. As described above, none of the currently identified projects would affect the hydrodynamics or sediment dynamics near sewer force mains. Alternative C's contribution to cumulative impacts would be less than significant (see SBSP Impact 3.16-8 in Section 3.16). The cumulative impacts of Alternative C and other cumulative projects would be less than significant.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action at Eden Landing. There are no sewer force main or outfalls in the vicinity of the Phase 1 ponds in the Eden Landing pond complex. None of the currently identified projects or unplanned levee breaches at Phase 1 locations within the Eden Landing pond complex would affect the hydrodynamics or sediment dynamics near sewer force mains. Therefore, the Phase 1 No Action would not contribute to cumulative impacts. No cumulative impact would result from the Phase 1 No Action and other cumulative projects.

Eden Landing Phase 1 No Action Level of Significance: No Impact

Phase 1 No Action at Alviso. None of the currently identified projects would affect the hydrodynamics or sediment dynamics near sewer force mains or outfalls. Unplanned levee breaches at Pond A6 assumed under Phase 1 No Action would result in negligible effects to the sewer force main from the Sunnyvale WPCP that discharges to Moffett Channel. Phase 1 No Action's contribution to cumulative impacts at the Alviso pond complex would be less than significant. The cumulative impacts of the Phase 1 No Action and other cumulative projects would be less than significant.

Alviso Phase 1 No Action Level of Significance: Less than Significant

Phase 1 No Action at Ravenswood. There are no sewer force main or outfalls in the vicinity of the Phase 1 ponds in the Ravenswood pond complex. None of the currently identified projects or continued pond management at Phase 1 locations within the Ravenswood pond complex would affect the hydrodynamics or sediment dynamics near sewer force mains or outfalls. Therefore, the Phase 1 No Action would not contribute to cumulative impacts. No cumulative impact would result from the Phase 1 No Action and other cumulative projects.

Ravenswood Phase 1 No Action Level of Significance: No Impact

Phase 1 Actions at Eden Landing. No sewer force mains or outfalls occur in the Eden Landing pond complex. Therefore, the Phase 1 actions in this pond complex would not contribute to cumulative impacts. No cumulative impact would result from the Phase 1 actions and other cumulative projects.

Eden Landing Phase 1 Actions Level of Significance: No Impact

Phase 1 Actions at Alviso. None of the currently identified projects would be expected to affect the hydrodynamics or sediment dynamics near sewer force mains in the Alviso pond complex. The planned tidal restoration at Pond A6 would result in negligible effects on water levels, tidal flows and sedimentation in Moffett Channel where the Sunnyvale WPCP outfall and infrastructure are located. Therefore, the Phase 1 actions in the Alviso pond complex would not contribute to significant cumulative impacts. The cumulative impacts of the Phase 1 actions and other cumulative projects would be less than significant.

Alviso Phase 1 Actions Level of Significance: Less than Significant

Phase 1 Actions at Ravenswood. No sewer force mains or outfalls occur in the Ravenswood pond complex. Therefore, the Phase 1 actions in this pond complex would not contribute to cumulative impacts. No cumulative impact would result from the Phase 1 actions and other cumulative projects.

Ravenswood Phase 1 Actions Level of Significance: No Impact

Cumulative Impact 3.16-7: **Disrupt Hetch Hetchy Aqueduct Service so as to create a public health hazard or extended service disruption.**

Alternative A. The Bay Division Pipeline Reliability Upgrade Project would improve the reliability of the water supply along the Hetch Hetchy Aqueduct by constructing a fifth Bay Division Pipeline along the existing SFPUC right-of-way, and a tunnel underneath San Francisco Bay and surfacing south of Pond SF2. Other cumulative projects are not expected to disrupt Hetch Hetchy Aqueduct services. The Bay Division Pipeline Reliability Upgrade Project would allow for regular maintenance without risking the reliability of the local water supply, and would provide a seismically engineered alternative to the vulnerable Bay Division Pipelines during an earthquake. Although the results from the South Bay Geomorphic Assessment (see Appendix I) contain substantial uncertainties, mudflats in the far South Bay are expected to accrete approximately 1.1 ft (0.34 m) over the next 50 years and much of the shoreline change in its north shore is expected to result from future sea level rise. Therefore, Alternative A would not significantly contribute to cumulative impacts to Hetch Hetchy Aqueduct service. The cumulative impacts of Alternative A and other cumulative projects would be less than significant/beneficial.

Alternative A Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative B. As described above, the Bay Division Pipeline Reliability Upgrade Project would result in a beneficial impact on the Hetch Hetchy system. The results from the South Bay Geomorphic Assessment (see Appendix I) indicate the mudflats in the far South Bay would continue to accrete, but only by

approximately 0.4 ft (0.12 m). Alternative B's contribution to cumulative impacts would be less than significant. The cumulative impacts of Alternative B and the Bay Division Pipeline Reliability Upgrade Project would be less than significant/beneficial.

Alternative B Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Alternative C. As described above, the Bay Division Pipeline Reliability Upgrade Project would result in a beneficial impact on the Hetch Hetchy system. Results from the South Bay Geomorphic Assessment (see Appendix I) indicate that mudflats in the far South Bay would erode 0.7 ft (0.22 m) over the next 50 years, and unlike Alternatives A and B, it is less certain whether sea level rise or tidal breaching would be the dominant factor in influencing shoreline retreat. Although shoreline erosion is not expected to adversely affect the integrity of the anticipated tunnel that would be constructed by the Bay Division Pipeline Reliability Upgrade Project, additional analysis and monitoring would be performed to ensure safety of the Aqueduct. As such, Alternative C's contribution to cumulative impacts would be less than significant. Therefore, the cumulative impacts of Alternative C and the Bay Division Pipeline Reliability Upgrade Project would be less than significant/beneficial.

Alternative C Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Phase 1 No Action. As described above, the Bay Division Pipeline Reliability Upgrade Project would result in a beneficial impact on the Hetch Hetchy system. The unplanned levee breaches or the continued pond management of Pond SF2 – the only Phase 1 location in the vicinity of the Hetch Hetchy Aqueduct – would result in less than significant changes to the shoreline in the vicinity of the Aqueduct. Therefore, cumulative impact of the Phase 1 No Action and the Bay Division Pipeline Reliability Upgrade Project would be less than significant/beneficial.

Phase 1 No Action Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Phase 1 Actions. As described above, the Bay Division Pipeline Reliability Upgrade Project would result in a beneficial impact on the Hetch Hetchy system. The Phase 1 actions would result in less than significant changes to the shoreline in the vicinity of the Aqueduct. The cumulative impact of the Phase 1 actions and the Bay Division Pipeline Reliability Upgrade Project would be less than significant/beneficial.

Phase 1 Actions Level of Significance: Less than Significant (CEQA); Beneficial (NEPA)

Cumulative Impact 3.16-8: **Disruption of rail service due to construction of coastal flood levees and tidal habitat restoration.**

Alternative A. Of the currently identified projects, the Shoreline Study would affect existing rail service provided by the Union Pacific Railroad (also known as the Coast Subdivision in the San Francisco Bay Regional Rail Plan) near the community of Alviso. Significant uncertainties exist with respect to the eventual Shoreline Study implementation. Therefore, the cumulative contribution to the disruption of rail

service is difficult to predict. If a Shoreline Study action includes the construction of a levee that provides flood protection across the existing Union Pacific railroad near the southwest corner of Pond A16 in the Alviso pond complex, rail service would be disrupted. One component of the San Francisco Bay Regional Rail Plan is to multi-track the Union Pacific Railroad between Newark and Alviso on a trestle in the 2030-2050 time frame. Future rail services are also proposed for the Dumbarton Rail Corridor Project, which would restore rail service across San Francisco Bay in the vicinity of the Ravenswood pond complex. If a Shoreline Study action includes the construction of a levee that provides flood protection in either area, rail service would be disrupted depending on the timing of the two potential projects. Levee construction would be coordinated with railroad improvements. Other cumulative projects are not expected to disrupt rail service. Alternative A's contribution to cumulative impacts would be less than significant (see SBSP Impact 3.16-8 in Section 3.16). Therefore, the cumulative impact of Alternative A and other cumulative projects would be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. Of the currently identified projects, only the Shoreline Study would have the potential to adversely affect existing rail service provided by the Union Pacific Railroad near the community of Alviso as well as future service proposed by the San Francisco Bay Regional Rail Plan near the Alviso pond complex, and the Dumbarton Rail Corridor Project near the Ravenswood pond complex, depending on the timing of the potential projects.

Alternative B would disrupt rail service through the construction of a levee that provides flood protection across the existing Union Pacific Railroad near the southwest corner of Pond A16. Alternative B would require mitigation to reduce potential effects. Levee-building activity would be coordinated with railroad improvements, including the San Francisco Bay Regional Rail Plan. Construction of a levee that provides flood protection in the vicinity of the proposed project at the Ravenswood pond complex could potentially disrupt rail service along the Dumbarton Rail Corridor if the levee alignment interfered with an active rail line. Alternative B's contribution to cumulative impacts would be less than significant with mitigation. The cumulative impacts of Alternative B and other cumulative projects would be potentially significant.

Alternative B Level of Significance: Potentially Significant

Alternative C. Implementation of Alternative C would require a levee that provides flood protection similar to the one described for Alternative B. Therefore, the cumulative impacts of Alternative C and other cumulative projects would be potentially significant.

Alternative C Level of Significance: Potentially Significant

Phase 1 No Action. Of the currently-identified cumulative projects, the Shoreline Study would affect existing service provided by the Union Pacific Railroad near the community of Alviso, as described above for Alternative A cumulative impacts. The Shoreline Study could also affect future service proposed by the San Francisco Bay Regional Rail Plan near the Alviso pond complex and the Dumbarton Rail Corridor Project near the Ravenswood pond complex, depending on the timing of the potential projects. The Phase 1 No Action alone would not affect rail service, since no new levee construction would occur

in the vicinity of the existing or proposed railroad alignments. As such, the Phase 1 No Action would not contribute to cumulative impacts. However, the cumulative impacts of the Phase 1 No Action and the Shoreline Study would be potentially significant.

Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 Actions. As described above for Phase 1 No Action, the Shoreline Study would affect existing and proposed rail service. The Phase 1 actions alone would not affect rail service, since no new levee construction would occur. As such, the Phase 1 No Action would not contribute to cumulative impacts. However, the cumulative impacts of the Phase 1 No Action and the Shoreline Study would be potentially significant.

Phase 1 Actions Level of Significance: Potentially Significant

---

Cumulative Impact 3.16-9: **Reduced access to sewer force mains due to levee construction.**

Alternative A. Of the currently identified projects, only the Shoreline Study would affect sewer force mains in the vicinity of the SBSP Restoration Project Area. Other cumulative projects are not expected to reduce access to sewer force mains. The East Bay Dischargers Authority (EBDA) effluent disposal system includes a buried sewer force main along a portion of Pond E6A in the Eden Landing pond complex. The South Bayside System Authority (SBSA) operates a sewer force main adjacent to the Ravenswood pond complex near Pond S5. A sewer force main is also located adjacent to the San Jose/Santa Clara WPCP near Pond A18. Potential Shoreline Study potential actions could include construction of levees that provide flood protection in the vicinity of the sewer force mains. The design of such levees, if any, would likely include elements such that continued maintenance access would not be adversely affected. As such, cumulative projects would result in less than significant impacts.

Alternative A's contribution to cumulative impacts associated with reduced access to sewer force mains would be less than significant (see SBSP Impact 3.16-9 in Section 3.16). Therefore, the cumulative impacts of Alternative A and other cumulative projects would be less than significant.

Alternative A Level of Significance: Less than Significant

Alternative B. As discussed above, cumulative projects would result in less than significant impacts associated with reduced access to sewer force mains. Under Alternative B, levee construction in the vicinity of the sewer force mains, if any, would be coordinated with the operating agencies. The design of such levees would include elements such that continued maintenance access would not be adversely affected. Alternative B's contribution to cumulative impacts would be less than significant. Therefore, the cumulative impacts of Alternative B and other cumulative projects would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. The cumulative impacts of Alternative C and other cumulative projects would be similar to those described for Alternative B and thus would be less than significant.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. None of the currently identified projects or unplanned levee breaches at Phase 1 locations would affect the buried sewer force mains described for Alternative A; Alternative A would not contribute to any significant impacts. Therefore, no cumulative impacts would be associated with the Phase 1 No Action and other cumulative projects.

Phase 1 No Action Level of Significance: No Impact

Phase 1 Actions. None of the currently identified projects or Phase 1 actions would affect the buried sewer force mains described under Alternative A. Therefore, no cumulative impacts would be associated with the Phase 1 actions and other cumulative projects.

Phase 1 Actions Level of Significance: No Impact

Visual Resources

Cumulative Impact 3.17-1: **Alter views of the SBSP Restoration Project Area.**

Alternative A. 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). Some of the cumulative projects, such as infrastructure projects involving buried pipelines, would not affect views. For those cumulative projects that would include features that could alter views, these changes would be required to comply with the applicable government policies and guidelines related to aesthetic resources pertaining to 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. As noted in Chapter 1, Introduction, the Shoreline Study potential actions may include construction of levees and floodwalls that could obstruct views of the Bay and other scenic features. Similarly, other flood protection projects and development projects could construct facilities which 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, impacts on views resulting from cumulative projects would be potentially significant.

As described in SBSP Impact 3.17-1, in Section 3.17, Visual Resources, the No Action Alternative would not construct new facilities which would obstruct or alter views. As such, the effects of Alternative A would be less than significant. While the effects of Alternative A would be less than significant, the cumulative impacts of Alternative A and other cumulative projects would be potentially significant.

Alternative A Level of Significance: Potentially Significant

Alternative B. As described above, impacts on views that would result from the cumulative projects would be potentially significant. As described in SBSP Impact 3.17-1 in Section 3.17, Visual Resources, Alternative B would include features (*e.g.*, flood protection levees, recreational components including signage and trails, restored tidal habitat) that would affect views of the Project Area. These features would be scattered throughout the Project Area on the east, south, and west side of the Bay, and they would maintain the open space appearance of the Bay shoreline. The proposed flood protection levees would obstruct some medium- and short-range views of the SBSP Restoration Project Area and the Bay from offsite viewpoints. However, these features would not obstruct designated scenic vistas or views from designated scenic highways. Furthermore, the proposed levees would provide opportunities for new trails; as shown in Figures 2-5b and 2-5c, new trails are proposed along the flood protection levees. These trails would provide new elevated viewing opportunities to the public. Given the flat terrain of the SBSP Restoration Project Area and its surroundings, the new elevated trails would provide improved viewing opportunities across the SBSP Restoration Project Area to the Bay. Consequently, the effects of Alternative B would be beneficial. While the effects of Alternative B would be beneficial, the cumulative impacts of Alternative B and other cumulative projects would be potentially significant.

Alternative B Level of Significance: Potentially Significant

Alternative C. Due to the similarity of Alternatives B and C, the cumulative impacts would be the same as discussed under Alternative B. Proposed trails under Alternative C is shown in Figures 2-7b and 2-7c.

Alternative C Level of Significance: Potentially Significant

Phase 1 No Action. As described above, impacts on views that would result from the cumulative projects would be potentially significant. At the program level, the No Action Alternative would have minimal effects on views of the Project Area. At the project level, the Phase 1 No Action would have minimal effects on views of the Project Area, including the Phase 1 ponds. While the effects of the Phase 1 No Action would be less than significant, the cumulative impacts of the Phase 1 No Action and other cumulative projects would be potentially significant.

Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 Actions. As described above, impacts on views that would result from the cumulative projects would be potentially significant. As described in Section 3.17, Visual Resources, the Phase 1 actions would include features (*e.g.*, recreational components including signage and trails, restored tidal habitat) that would alter views of the Phase 1 ponds. However, because the open space appearance of the Bay shoreline would be maintained, and recreation facilities would provide new viewing opportunities of the Phase 1 ponds and surrounding Project Area as well as the Bay, the effects of the Phase 1 actions on views would be beneficial. While the effects of the Phase 1 actions would be beneficial, the cumulative impacts of the Phase 1 actions and other cumulative projects would be potentially significant.

Phase 1 Actions Level of Significance: Potentially Significant

Cumulative Impact 3.17-2: **Alter the existing visual character of the Project Area and its surroundings.**

Alternative A. As discussed in Cumulative Impact 3.17-1 above, other cumulative projects (including residential, commercial, industrial, flood control, restoration, and recreation projects) would alter the visual character 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. Visual characteristics in the South Bay include industrial, commercial and residential development in urban inland areas, and managed ponds (including salt ponds currently in production and former salt ponds within the Project Area), bayside mudflats, restored marshes, sloughs, and parks in open space areas along the Bay shoreline. Cumulative projects are expected to occur within areas with compatible land uses (see Cumulative Impact 3.9-1 above for a discussion of the cumulative projects' compatibility with land use designations). For cumulative projects within the SBSP Restoration Project Area (*e.g.*, flood control projects under the Shoreline Study), these projects would be similar to those proposed under Alternative B. Impacts on visual character from other cumulative projects would be less than significant as these projects are not expected to change the open space nature of the SBSP Restoration Project Area and its surroundings to urban uses.

As described in Cumulative Impact 3.17-1 above, visual changes to the Project Area under the No Action Alternative would result from natural deterioration of some of the existing levees over time. Although the existing visual character of the SBSP Restoration Project Area and its surroundings may change slightly over the next 50 years as some ponds become tidal due to unintentional levee breaching, it would not result from any planned actions. While some areas would be converted from ponds to seasonal wetland or tidal habitat, most of the Project Area would retain its existing visual character. Consequently, the effects of Alternative A on the visual character of the Project Area and its surroundings would be less than significant. The cumulative impacts of Alternative A and other cumulative projects would be less than significant.

Alternative A Level of Significance: Less than Significant

Alternative B. As discussed above, the other cumulative projects would result in a less-than-significant impact on the visual character of the SBSP Restoration Project Area and its surroundings. Under Alternative B, the visual character of the Project Area would be altered from existing conditions as ponds are converted to tidal habitat. The currently industrial character of the former salt ponds with their polygonal structure would become more natural when levees are breached and 50 percent of the ponds are opened to tidal action and eventually fill in and become covered with marsh vegetation.

The provision of a more lush and less industrial appearance would enhance the visual diversity of the overall shoreline by increasing the contrast of tidal habitat, managed ponds, and the colors of the ponds. The provision of more contrast compared to a uniform look adds to the richness of SBSP Restoration Project Area's visual character. The contribution of Alternative B to cumulative impacts is similar to that

described above for Cumulative Impact 3.17-1, and would be beneficial. The cumulative impacts of Alternative B and other cumulative projects would be less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C. Due to the similarity of Alternatives B and C, the cumulative impacts would be the same as discussed under Alternative B.

Alternative C Level of Significance: Less than Significant

Phase 1 No Action. As discussed above, the cumulative projects would result in a less-than-significant impact on the visual character of the SBSP Restoration Project Area and its surroundings. At the program level, limited O&M activities and natural changes (*e.g.*, gradual deterioration of the levees) would occur under the No Action Alternative. At the project level, the Phase 1 No Action would also result in natural changes in the visual character of the Phase 1 ponds. While some of the Phase 1 ponds would be converted to seasonal wetland or tidal habitat as levees gradually deteriorate, their visual character would not change substantially. The Phase 1 ponds would still exhibit an open space character consistent with the surrounding baylands. Therefore, the effects of the Phase 1 No Action on the visual character of the Project Area and its surroundings would be less than significant. The cumulative impacts of the Phase 1 No Action and other cumulative projects would be less than significant.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions. As discussed above, the cumulative projects would result in a less-than-significant impact on the visual character of the SBSP Restoration Project Area and its surroundings. Visual changes for the Phase 1 actions would be limited in extent, occurring only within the ponds where construction would occur. The overall visual character of the SBSP Restoration Project Area would not change substantially, as it would under the long-term Alternatives B and C (see SBSP Impact 3.17-2 above). The minor changes that would occur within the Phase 1 action ponds would result in a more natural and less industrial visual character, which would be beneficial. The tidal areas would eventually contain lush marsh vegetation which would provide visual contrast next to the geometric structures of the ponds. The Phase 1 managed ponds would include nesting islands which would increase bird use, which in turn would add richness to the SBSP Restoration Project Area's visual character. Consequently, the effects of the Phase 1 actions on the visual character of the Project Area and its surroundings would be beneficial. The cumulative impacts of the Phase 1 actions and other cumulative projects would be less than significant.

Phase 1 Actions Level of Significance: Less than Significant

5. OTHER SECTIONS REQUIRED BY NEPA AND CEQA

5.1 Irreversible or Irretrievable Commitment of Resources

Section 15126.2(c) of the California Environmental Quality Act (CEQA) Guidelines states: "Uses of nonrenewable resources during the initial and continued phases of the Project may be irreversible since a large commitment of such resources makes removal or irreversible nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also, irreversible damage can result from accidents associated with the Project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified."

Implementation of Alternative A would result in a very limited irreversible or irretrievable commitment of resources, since no restoration activities would occur within the South Bay Salt Pond (SBSP) Restoration Project Area (although some tidal restoration may occur from unintentional levee breaching) and levee improvements would be limited. A limited degree of operations and maintenance (O&M) activities (*e.g.*, levee improvement and replacement of water control structures) would involve some labor as well as energy usage by construction equipment, but this would be considered a relatively minor commitment of resources.

Compared to Alternative A, implementation of Alternatives B and C would involve a greater use of resources such as fossil fuels and labor, due to the greater degree of energy required to implement the restoration, flood protection and recreation and public access features proposed under these alternatives. However, most of these resources would be used during the implementation stages of Alternative B or C, rather than on a continual basis over the long term. Therefore, this commitment of resources would not be considered significant.

5.2 Growth Inducement

Section 15162.2(d) of the CEQA Guidelines requires that an Environmental Impact Report (EIR) address the potential growth inducing impacts of a proposed project. Specifically, the EIR shall "discuss the ways in which a project could foster economic or population growth, or the construction of additional housing either directly or indirectly, in a surrounding environment." Projects which could remove obstacles to population growth must also be considered in this discussion.

Existing and projected total population and households in the three counties and individual cities where the SBSP Restoration Project Area is located are shown in Tables 4-1 through 4-4 in Chapter 4, Cumulative Impacts. As shown, the growth rate ranges from 17 to 36 percent over 25 years, at an average annual growth rate of one percent for most cities. Growth rates are above one percent per year for the cities of Union City and San Jose. The SBSP Restoration Project does not propose construction of any housing, directly or indirectly, in the Project vicinity.

Because no restoration activities and only limited O&M activities (*e.g.*, levee improvements, replacement of water control structures) would occur under Alternative A, no economic, population or housing growth would result from implementation of this alternative.

Implementation of Alternatives B or C would lead to an increase in public access and recreational opportunities in the SBSP Restoration Project Area, potentially resulting in some economic growth to the area associated with an increase in area businesses (see Section 3.11, Socioeconomics). However, this potential economic growth would be considered minor relative to the local and regional economy. While these alternatives would increase recreational opportunities, such facilities are not a known constraint to population growth in the Bay Area. The proposed improvements are unlikely to induce or encourage additional population growth or development elsewhere, or remove obstacles to population growth. As such, the SBSP Restoration Project would not result in direct growth or induce substantial growth in the region. Potential effects are considered less than significant.

5.3 NEPA Consultation

5.3.1 Federal Endangered Species Act (16 USC Section 1521 et seq.)

Section 7 of the Federal Endangered Species Act (FESA) requires federal agencies, in consultation with the Secretary of the Interior, to ensure that their actions do not jeopardize the continued existence of endangered or threatened species, or result in the destruction or adverse modification of the critical habitat of these species. Under Section 7, a project that could result in incidental take of a listed threatened or endangered species must consult with the United States Fish and Wildlife Service (USFWS) to obtain a Biological Opinion (BO). If the BO finds that the project could jeopardize the existence of a listed species ("jeopardy opinion"), the agency cannot authorize the project until it is modified to obtain a "nonjeopardy" opinion.

Impacts to federally endangered and threatened species are discussed in Section 3.6, Biological Resources. The lead agencies, whose mandates are to protect fish and wildlife resources, have conducted extensive informal consultation with the USFWS Endangered Species Unit regarding potential impacts of the SBSP Restoration Project, and the development of the Project's Biological Assessment and BO. As described in Section 3.6, potential significant effects to these listed species would either be avoided through the implementation of the Adaptive Management Plan that is an integral part of the SBSP Restoration Project, or through implementation of measures established in the BO to avoid or minimize potential effects to biological resources. Prior to construction of the SBSP Restoration Project, the lead agencies would obtain concurrence from the USFWS Endangered Species Unit that the Project, with implementation of the measures established in the Adaptive Management Plan and BO, would not adversely affect federally listed endangered or threatened species. Concurrence by USFWS and the United States Army Corps of Engineers (Corps) would fulfill the requirements of this Act.

5.3.2 Fish and Wildlife Coordination Act (16 USC Section 651 et seq.)

The Fish and Wildlife Coordination Act requires that agencies consult with fish and wildlife agencies (federal and state) on projects where the waters of any stream or other body of water are proposed or

authorized to be impounded, diverted, the channel deepened, or the stream or other body of water otherwise controlled or modified for any purpose whatsoever, including navigation and drainage, and that could affect biological resources. Compliance with the Fish and Wildlife Coordination Act will be achieved through consultation with USFWS, NMFS, and CDFG by federal agencies when issuing permits for Project activities by sponsoring agencies, or when implementing other activities related to the SBSP Restoration Project.

5.3.3 Federal Migratory Bird Treaty Act, Bald and Golden Eagle Protection Act, and Executive Order 13168

The Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act prohibit the take of migratory birds (or any part, nest, or eggs of any such bird) and the take and commerce of eagles. Executive Order (EO) 13186 requires that any project with federal involvement address impacts of federal actions of migratory birds. Impacts to migratory birds and other protected birds and their nests are discussed in Section 3.6, Biological Resources, of this EIS/R. Potential significant effects to these species would be avoided through implementation of the Adaptive Management Plan, an integral part of the SBSP Restoration Project, or through implementation of measures established in the BO. The analyses provided in Section 3.6, Biological Resources, demonstrate USFWS's compliance with the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, and EO 13168.

5.3.4 National Historic Preservation Act (15 USC Section 470 et seq)

Section 106 of the National Historic Preservation Act (NHPA) requires federal agencies to evaluate the effects of federal undertakings on historical, archaeological, and cultural resources. As described in Section 3.8, Cultural Resources, of this EIS/R, the Section 106 review process occurs in four steps: Initiation of the process; identification of historic properties; assessment of adverse effects; and resolution of adverse effects. As part of the Section 106 process initiation, USFWS requested consultation with the State Historic Preservation Offices (SHPO) regarding the SBSP Restoration Project. USFWS sent a letter to the Office of Historic Preservation in July 2004 to introduce the Project, define the Project's Area of Potential Effect (APE), establish the scope of the identification effort, and suggest the methods for consulting with SHPO. In addition, USFWS requested that the program alternatives be considered by the SHPO under the 1997 Programmatic Agreement (PA) between SHPO and USFWS; activities that do not meet the requirements of the PA will proceed through the standard Section 106 process. USFWS also indicated that the historic context report of the solar salt industry and evaluation framework for identifying historic resources within the APE will be provided to SHPO for review and comment. SHPO responded in November 2004 concurring with USFWS delineation of the Project's APE; however, it did not respond to the other requests by USFWS. USFWS will complete identification efforts for the SBSP Restoration Project either under the terms of the 1997 PA or the standard Section 106 process. Since the long-term restoration would occur over a 50-year planning period, the identification of historic properties and assessment of effects would be phased to match Project phasing. In order to facilitate an identification effort that is consistent and comprehensive throughout the life of the Project, USFWS will provide SHPO with a historic context and an evaluation framework to serve as the basis for eligibility determinations. Potential effects of the SBSP Restoration Project associated with cultural resources are

addressed in Section 3.8, Cultural Resources, of this EIS/R. The analysis provided in Section 3.8 and the continued consultation with SHPO will ensure that USFWS complies with the NHPA.

As the federal lead agency, USFWS is tasked with completing Section 106 consultation with Native Americans and other stakeholders for this undertaking.

5.3.5 Executive Order 11988 – Floodplain Management and Executive Order 11990 – Protection of Wetlands

EO 11988 requires federal agencies to recognize the values of floodplains and to consider the public benefits from restoring and preserving floodplains. Section 3.3, Hydrology, Flood Management and Infrastructure, describes EO 11988 in more detail. Under EO 11990, federal agencies must avoid affecting wetlands unless it is determined that no practicable alternative is available.

As discussed in Chapter 1, Introduction, two of the objectives of the proposed SBSP Restoration Project are to: (1) create, restore, or enhance habitats of sufficient size, function, and appropriate structure to promote restoration of native special-status plants and animals, maintain current migratory bird species, support increased abundance and diversity of native species, and (2) maintain or improve existing levels of flood protection in the South Bay. Section 3.3 discusses in further detail potential Project impacts associated with coastal flood risk. The objectives of the Project as well as the analysis provided in Section 3.3 demonstrate USFWS's compliance with these EOs.

5.3.6 Farmland Protection Policy Act (7 USC Section 4201 et seq.)

The Farmland Protection Policy Act (FPPA) requires a federal agency to consider the effects of its actions and programs on the nation's farmlands. The FPPA is intended to minimize the impact of federal programs with respect to the conversion of farmland to nonagricultural uses. It assures that, to the extent possible, federal programs are administered to be compatible with state, local, and private programs and policies to protect farmland. As discussed in Section 3.9, Land Use, no designated important farmlands are located within the SBSP Restoration Project Area. As such, the lead agencies would be in compliance with this Act.

5.3.7 Executive Order 12898 – Social Justice

EO 12898 prohibits discrimination against or exclusion of individuals and populations during the conduct of federal activities. It requires all federal agencies to identify and address disproportionately high and adverse human health or environmental effects of its programs and activities on minority and low-income populations. Section 3.11, Socioeconomics and Environmental Justice, describes the socioeconomic setting as it relates to the SBSP Restoration Project Area and evaluates the potential for the Project to disproportionately affect minority or low-income groups. As described in Section 3.11, the SBSP Restoration Project would not disproportionately affect minority and low-income communities. The analysis provided in this EIS/R regarding socioeconomic effects demonstrates USFWS's compliance with this EO.

5.3.8 Executive Order on Trails for America in the 21st Century

The executive order on Trails for America requires federal agencies to protect, connect, promote, and assist trails of all types throughout the United States. As described in Chapter 1, Introduction, one of the objectives of the SBSP Restoration Project is to provide public access and recreational opportunities compatible with wildlife and habitat goals. Section 3.7, Recreation Resources, describes the existing and proposed recreational facilities within the SBSP Restoration Project Area, as well potential effects (beneficial and less than significant) on such resources. The SBSP Restoration Project would provide recreation and public access opportunities in the Project Area, including new trails. Therefore, USFWS would promote the goals of this EO.

5.3.9 Clean Air Act

Federal agencies must ensure that their actions conform to applicable federal, state, or tribal implementation plans for achieving national ambient air quality standards. To conform, federal actions must not contribute to new violations of the standards, increase the frequency or severity of existing violations, or delay the timely attainment of standards in the area of concern. Section 3.14, Air Quality, describes existing conditions in the Project Area, regulations relevant to air quality, and potential air quality effects resulting from the SBSP Restoration Project. The analysis provided in Section 3.14 demonstrates USFWS's compliance with this act.

6. GLOSSARY

100-year floodplain: The area adjacent to a water body that would be inundated during a base flood.

archimedes screw: A machine historically used for transferring water from a low-lying body of water into irrigation ditches.

accretion: The act of adding material, such as from the deposition and accumulation of waterborne particles.

acute toxicity: For purposes of this project, a median of less than 90 percent survival, or less than 70 percent survival more than 10 percent of the time, of test organisms in a 96-hour static or continuous flow test. See also *chronic toxicity*.

adsorption: The adherence of a gas, liquid, or dissolved material on the surface of a solid.

algae: Simple rootless plants that grow in bodies of water (*e.g., estuaries*) at rates dependent on sunlight, temperature and the amounts of plant nutrients (*e.g.*, nitrogen and phosphorus) available in water.

alluvial: Relating to the deposits made by flowing water; washed away from one place and deposited in another; as, alluvial soil, mud, accumulations, deposits.

Alquist Priolo Act: The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. This state law was a direct result of the 1971 San Fernando Earthquake, which was associated with extensive surface fault ruptures that damaged numerous homes, commercial buildings, and other structures. The Alquist-Priolo Earthquake Fault Zoning Act's main purpose is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. The Act only addresses the hazard of surface fault rupture and is not directed toward other earthquake hazards. The Seismic Hazards Mapping Act, passed in 1990, addresses non-surface fault rupture earthquake hazards, including liquefaction and seismically induced landslides.

amphibian: A cold-blooded, smooth-skinned vertebrate animal of the class Amphibia, such as a frog or salamander, that typically hatches as an aquatic larva with gills. The larva then transforms into an adult having air-breathing lungs.

amphipods: A small freshwater or marine crustacean with a thin body and without a carapace.

anadromous: Fish and invertebrates, such as shrimp, migrating from saline to fresh water to spawn.

anaerobic: Not containing oxygen or not requiring oxygen.

anoxic: Without oxygen; water that contains no dissolved oxygen.

anthropogenic: Involving the impact of humans on nature; induced, caused, or altered by the presence and activities of humans, as in water and air pollution.

aquifer: Underground rock or soil layer yielding groundwater for wells and springs, etc.

astronomic tides: The periodic rise and fall of a body of water resulting from gravitational interactions between the Sun, Moon and Earth.

atlatl: Spear-thrower.

attenuation: Reduction.

base flood: A flood having a one percent chance of being equaled or exceeded in any given year.

bathymetry: Of or relating to measurements of the depths of water bodies, such as oceans, estuaries or lakes.

baylands: Shallow water habitats around the Bay. They include lands that are touched by tides and lands that would be tidal in the absence of man-made structures.

benthic organisms: Those organisms living at or near the bottom of a body of water.

berm: A mound or bank of earth, used especially as a barrier.

bioaccumulation: The increase in concentration of a chemical in organisms that reside in environments contaminated with low concentrations of various organic compounds. Also used to describe the progressive increase in the amount of a chemical in an organism resulting from rates of absorption of a substance in excess of its metabolism and excretion.

biosentinel: Wildlife or plant species that can be used as a primary indicator of a spatial pattern or temporal trend.

biota: The combined *flora* and *fauna* of a region.

biotic: Pertaining to life or living things, or caused by living organisms.

bittern pond: A repository of concentrated soluble salts other than sodium chloride.

bittern: Waste materials left over after common salt (sodium chloride) was harvested from the salt ponds. Shown in laboratory studies to have *toxic* effects on aquatic life.

bog: A wetland that has poorly-drained, acidic peat soil dominated by sedges and sphagnum moss.

borrow ditch: An excavated ditch adjacent to the pond levees where material was excavated in order to create and maintain the pond levees.

brackish water: Water containing a mixture of seawater and fresh water; contains dissolved materials in amounts that exceed normally acceptable standards for municipal, domestic, and irrigation uses.

brackish: A mixture of fresh and saltwater typically found in estuarine areas; of intermediate salinity.

breach: An opening (especially a gap in a levee).

brines: Water containing large amounts of a salt or salts, especially sodium chloride.

buffer zone: A barrier between sensitive wildlife habitat and land uses such as agriculture or urban development. A transitional zone intended to provide for compatibility of nearby dissimilar uses.

candidate species (*federal definition)*: A species for which the U.S. Fish and Wildlife Service has on file sufficient information to support a proposal to list the species as endangered or threatened, but for which proposed rules have not yet been issued.

candidate species (state definition): A native species or subspecies of a bird, mammal, fish, amphibian, reptile, or plant that the California Fish and Game Commission has formally noticed as being under review by the California Department of Fish and Game for addition to either the list of endangered species or the list of threatened species, or a species for which the Commission has published a notice of proposed regulation to add the species to either list.

catadromous: Fish and invertebrates, such as shrimp, migrating from fresh to saline water to spawn.

channel density: The amount of channel habitat per acre of marshplain.

chronic toxicity: A detrimental biological effect on growth rate, reproduction, fertilization success, larval development, population abundance, community composition, or any other relevant measure of the health of an organism, population, or community. See also *acute toxicity*.

congeners: Elements belonging to the same group on the periodic table (*e.g.*, sodium and potassium); compounds produced by identical synthesis reactions and procedures.

cytochemical: Related to the chemistry of cells.

datum: A base elevation used as a reference from which to reckon heights or depths.

deep-water habitat: Aquatic habitats, such as in lakes, rivers and oceans, where surface water is permanent and deeper than 6.6 feet (2 meters) most of the year.

delta: A nearly flat plain of alluvial deposits between diverging branches of the mouth of a river.

demersal: Dwelling at or near the bottom of a body of water.

desalination: The removal of salt (especially from sea water).

detritus: Organic waste material from decomposing dead plants or animals.

diadromous fishes: Fishes that migrate through estuaries on their way either to fresh water or to salt water. Includes anadromous species, which migrate from salt water to spawn in fresh water, and catadromous species, which migrate from fresh water to spawn in the ocean.

diatoms: A major group of eukaryotic algae, and one of the most common types of phytoplankton.

ditch block: A constructed blockage in a flow path, such as a borrow ditch, designed to deflect the flow of water into an alternate flow path, such as a historic marsh channel.

diurnal: Having a daily cycle.

diversity: An ecological measure of the variety of organisms present in a habitat.

donut: A circular water control structure that has multiple intakes and that is used to distribute water through a canal and siphon system.

ebb tide: The tide defined when the movement of the tidal current is away from the shore or down a tidal river or estuary.

ecology: The study of the interactions between living things and their environment.

ecosystem: A basic functional unit of nature comprising both organisms and their nonliving environment, intimately linked by a variety of biological, chemical, and physical processes.

ecotone: A transition zone between two ecosystems.

endangered (*federal definition*): Any species which is in danger of extinction throughout all or a significant portion of its range.

endangered *(state definition)*: A native species or subspecies of a bird, *mammal*, fish, *amphibian*, reptile, or plant which is in serious danger of becoming extinct throughout all, or a significant portion, of its range due to one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, or disease.

essential fish habitat: Waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.

estuarine: Of, relating to, or found in an *estuary*.

estuary: The wide part of a river where it nears the sea; where fresh and salt water mix in a semi-enclosed body of water.

eustatic sea level: The global sea level, effected by changes due to glacial melting or formation, thermal expansion or contraction of sea water, etc.

eutrophication: Having waters rich in mineral and organic nutrients that promote a proliferation of plant life, especially algae, which reduces the dissolved oxygen content and often causes the extinction of other organisms.

exotic species: Any introduced plant or animal species that is not native to the area and that may be considered a nuisance (*e.g.*, Norway rat, *Spartina*, etc.). See also invasive species.

fauna: Animals, especially the animals of a particular region or period, considered as a group.

floodplain: An area adjacent to a lake, stream, ocean or other body of water lying outside the ordinary banks of the water body and periodically filled by flood flows. Often referred to as the area likely to be filled by the 100-year flood (base flood).

flora: Plants considered as a group, especially the plants of a particular country, region, or time.

fluvial flooding: Results when river, stream or creek discharges overtop their banks and result in the inundation of adjacent lands.

geomorphic: Pertaining to the shape or surface of the earth, including small-scale changes in land surface resulting from restoration projects.

geotechnical: A science that deals with the application of geology to engineering.

ground lurching: The horizontal movement of ground located adjacent to slope faces during strong, earthquake-induced ground motion.

groundwater: Water that penetrates the earth's surface from precipitation and from infiltration from streams; water present below ground from ponds and lakes; water that flows or ponds underground.

habitat: The range of environmental factors at a particular location supporting specific plant and animal communities.

halophyte: Salt-tolerant vegetation.

halophytic: having the characteristics of a hylophyte (salt-tolerant) plant.

hazardous air pollutant: The classification, under federal law, for a pollutant that increases the public's risk of developing cancer. See also *toxic air contaminant.*

hemiparasitic: Partially dependent on another host plant in order to survive.

histopathological: Pertaining to the tissue changes that affect a part or accompany a disease.

hydraulic: Of or involving a fluid, especially water, under pressure.

hydrodynamics: Deals with the motion of fluids.

hydrographic: The scientific description and analysis of the physical conditions, boundaries, flow, and related characteristics of the earth's surface waters.

hydrology: The scientific study of the properties, distribution, and effects of water on the earth's surface, in the soil and underlying rocks, and in the atmosphere.

hygroscopic: Describing a chemical substance with an affinity for water, one that will absorb moisture, usually from the air.

hypersaline: Marked by increased salt in a saline solution. Applies to highly saline *brines*, typically several times as salty as seawater.

hypoxic: Refers to natural waters that have a low concentration of dissolved oxygen (≤2 milligrams per liter as compared with a normal level of 8–10 milligrams per liter).

igneous: Said of a rock or mineral that solidified from molten or partially molten material, *i.e.*, from a magma.

infauna: Aquatic animals that live in the substrate of a body of water, especially in a soft sea bottom.

intermittent stream: A stream filled with water for only a portion of the year.

interstitial: Pertaining to the interstices, or small spaces between adjacent objects.

intertidal habitat: The tidal area between the mean lower low water (*MLLW*) and mean higher high water (*MHHW*) which is alternately exposed and covered by water twice daily.

intertidal mudflats: The habitat zone that is generally found between MLLW and approximately one foot above local mean sea level and that lacks vascular plants.

inundation: Covered by a flood.

invasive species: A species that is 1) non-native (*exotic*) to the ecosystem under consideration and 2) whose introduction causes or is likely to cause economic or environmental harm or harm to human health.

invertebrate: A animal without a backbone.

jurisdictional wetlands: Wetlands which meet the criteria of "waters of the United States" and are thereby under the jurisdiction of the Corps and the USEPA. The definition developed by the Corps considers as wetlands those areas which "...are inundated or saturated by surface or ground water at a frequency and duration to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Under this definition, all three of the following conditions must be present: a) a dominance of wetland plants; b) hydric soils (soils with low oxygen concentrations in the upper layers during the growing season); and c) wetlands hydrology.

lagoon: A coastal body of water separated from the ocean by a sand bar, which may periodically breach, opening the lagoon to the ocean for a time. Lagoons can form where a river meets the ocean (an estuarine lagoon), or without the influence of a river.

larvicide: Control agent that targets the larval portion of the life cycle, as used in the control of mosquitoes.

lateral and vertical tectonic displacement: The large scale horizontal and vertical movement of the Earths crust due to structural plate interaction.

lateral spreading: The horizontal displacement of soil during strong, earthquake-induced ground motion.

levee: A barrier constructed to contain the flow of water, prevent flooding, or to keep out the sea.

liquefaction: see "soil liquefaction".

lower tidal marsh: Habitat that occurs above mudflats along stream and slough channels and typically is found between mean tide level and mean high water (3.3-5.5 feet National Annual Vertical Datum 88). Within the range of daily tidal fluctuations; ground surface and low-growing plants are exposed at low tides and completely inundated at higher tides and during periods of high stream discharge.

mammal: Any of various warm-blooded vertebrate animals of the class Mammalia, including humans, characterized by a covering of hair on the skin and, in the female, milk-producing mammary glands for nourishing the young.

managed ponds: Diked wetland, generally shallow open water habitats.

marsh: A common term applied to describe treeless *wetlands* characterized by shallow water and abundant emergent, floating, and submerged wetland *flora*. Typically found in shallow basins, on lake margins, along low gradient rivers, and in calm tidal areas. Marshes may be fresh, brackish or saline, depending on their water source(s).

marsh panne: Marsh pannes are topographic depressions on mature tidal marsh plains. They are most common in areas most distant from any tidal source and exist on drainage divides between channel networks, and on the backsides of natural levees. Marsh pannes range in age from less than 50 years to more than 1,500 years.

mean sea level: The arithmetic mean of hourly heights observed over the National Tidal Datum Epoch.

metamorphic rock: Any rock derived from pre-existing rocks by mineralogical, chemical, and/or structural changes, essentially in the solid state, in response to marked changes in temperature, pressure, shearing stress, and chemical environment, generally at depth in the earth's crust.

methylation: Conversion of sediment-bound mercury may through both biotic and abiotic processes to its more bioavailable methylated form. Methyl mercury has known neurological toxicity effects that tend to increase at each level up the food chain in aquatic environments. Thus, the availability of such contaminants, even in the seemingly insignificant parts per trillion range, often are ecologically important.

MHHW: Mean Higher High Water, the average height of the higher of the two daily high tides.

MHW: Mean High Water, the average height of all the high tides.

microtidal marsh: A tidal marsh that receives less than full tidal flow because of a physical impediment. Muting can result from the presence of natural formations such as a sand bar or of human-made structures such as tide gates, culverts, or other water control structures. Muted tidal marshes exhibit many of the same features of fully tidal marshes, although they frequently lack the same range of plant diversity.

middle tidal marsh: Habitat that occurs between mean high water and mean high higher water (5.5-6.0 feet National Annual Vertical Datum 88); inundated only during higher high tides.

migratory: Moving regularly or occasionally from one region or climate to another; as, migratory birds.

MLLW: Mean Lower Low Water, the average height of the lower of the two daily low tides.

MLW: Mean Low Water, the average height of all low water heights.

morphology: That branch of biology which deals with the structure of animals and plants.

MTL: Mean Tide Level.

mudflat: Flat un-vegetated wetlands subject to periodic flooding and minor wave action. The area, which lies between tidal marshes and the edge of the Bay at low tide, provides habitat for invertebrates, fish, and shorebirds.

mutagenicity: The capacity to induce a mutation or an abrupt change in the genetic constitution of an organism.

muted tidal marsh: A tidal marsh that receives less than full tidal flow because of a physical impediment. Muting can result from the presence of natural formations such as a sand bar or of human-made structures such as tide gates, culverts, or other water control structures that reduce the range of the tides but still allow for frequent inundation. Muted tidal marshes exhibit many of the same features of fully tidal marshes, although they frequently lack the same range of plant diversity. Also referred to as damped tidal marsh (see also microtidal marsh).

native species: Species which have lived in a particular region or area for an extended period of time.

navigation channel: The buoyed, dredged, and policed waterway through which ships proceed, especially in general shallow areas.

neap tides: The tides resulting when the sun and moon are at right angles to each other, characterized by a reduced tidal range.

nonattainment areas: Areas that do not meet the national ambient air quality standards established in 1970 by the Clean Air Act.

nonpoint source: A diffuse source of pollution that cannot be attributed to a clearly identifiable, specific physical location or a defined discharge channel. This includes the nutrients that run off the ground from any land use (*e.g.*, croplands, feedlots, lawns, parking lots, streets, forests, etc.) and enter waterways. It also includes nutrients that enter through air pollution, through the groundwater, or from septic systems.

nutrient load: Quantity of plant nutrients added to a given area (*e.g.*, a pond).

obligates: Obligate wetland plant species. Wetland indicator species are designated according to their frequency of occurrence in wetlands. Obligate and facultative wetland indicator species are hydrophytes

that occur "in areas where the frequency and duration of inundation or soil saturation produce permanently or periodically saturated soils of sufficient duration to exert a controlling influence on the plant species present" (Environmental Laboratory 1987).

organoarsenical: Of, relating to, or being an organic compound that contains arsenic.

outfall: The place where a sewer, drain, or stream discharges.

oxidant: An oxidizing agent.

pannes: See salt pannes.

pelagic: Referring to the open sea at all depths.

peripheral halophytes: Plants adapted to living in a saline environment. Peripheral halophytes occur along the banks and tops of levees separating tidal areas from salt ponds, and occasionally along levees separating salt ponds from each other.

permeability: The degree to which something (*e.g.*, an earthen structure) can be penetrated by a liquid.

pH: Measure of the acidity or alkalinity (basicity) of water (pH 7 is neutral, increasing values indicate alkalinity and decreasing value indicate acidity).

phytoplankton: Small (often microscopic) aquatic plants suspended in water.

piscivorous: Fish-eating.

point source: A source of pollution that can be attributed to a specific physical location; an identifiable, end of pipe "point." The vast majority of point source discharges of plant nutrients are from wastewater treatment plants, although some come from industries.

point-source discharge: A discharge of a pollutant from an identifiable point, such as a pipe, ditch, channel, sewer, tunnel, or container.

pond complex: A group of salt ponds being treating as a unit for planning purposes.

ppt: Parts per thousand (used as a measurement of salinity); the salinity of ocean water is approximately 35 ppt.

proposed species of concern (*federal definition*): A group of organisms for which a general notice has been published in a local newspaper and a proposed rule for listing has been published in the Federal Register. A species that may or may not be listed in the future (formerly "C2 candidate species" or "species under consideration for listing for which there is insufficient information to support listing").

rare *(state definition)*: A species, subspecies, or variety is rare when, although not presently threatened with extinction, it is in such small numbers throughout its range that it may become endangered if its present environment worsens.

restoration: The return of an ecosystem to a close approximation of its condition prior to disturbance.

riparian area: Riparian refers to the area of land adjacent to a body of water, stream, river, marsh, or shoreline, forming a transition between the aquatic and the terrestrial environment.

riprap: Large rock or other material often used to stabilize streambanks or erosive shorelines.

ruderal: Disturbed habitat usually of poor quality.

saline wedge: Viscous, dense brine that forms in the siphon when the denser, heavier saline water falls to the bottom of the siphon and blocks the passage of water.

salina: Natural impoundment of tidal water less than 30 cm deep on the high marsh plain. They tend to be longer than wide, and to parallel the extreme high tide contour.

saline: Of, relating to, or containing salt; salty.

salinity: A measure of the salt concentration of water; higher salinity means more dissolved salts.

salt marsh: A coastal habitat consisting of salt-resistant plants residing in an organic-rich sediment.

salt pannes: Salt pannes are shallow, generally unvegetated areas that form shallow ponds on the salt marsh. They become hypersaline in late summer. Salt pannes often contain fish populations and provide valuable habitat for shorebirds when flooded.

salt ponds: Commercial facilities that extract salt from Bay water by evaporation. Algae are the main vegetation, brine shrimp and birds the primary inhabitants.

sand boil: Sand and water ejected to the ground surface as a result of liquefaction at shallow depth; the conical sediment deposit that remains as evidence of liquefaction

sausal: Sausals (termed by Spanish explorers) are groves of willows on flat lands, often associated with creeks that are sustained by springs, seeps, or a shallow water table.

seasonal wetlands: Shallow depressions that typically contain standing water during the rainy season but become drier, or dry out, in summer and fall. They include diked (formerly tidal) salt and brackish marshes, farmed wetlands, abandoned salt ponds, inland freshwater marshes and vernal pools.

sediment budget: An accounting of all sediment delivery, export, and storage.

sedimentation: The deposition or accumulation of sediment.

semidiurnal: Occurring twice each day.

sensitive species (*federal definition*): Those plant and animal species identified by a regional forester for which population viability is a concern, as evidenced by significant current or predicted downward trends

in population numbers or density, or significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

sessile: Sitting directly on base without support, stalk, pedicel, or peduncle; attached or stationary as opposed to free living, or exhibiting or capable of movement.

slough: A narrow, winding waterway edged with marshy and muddy ground. These water bodies are distinguished by low flow or stagnant waters.

soil liquefaction: The sudden and total loss of soil strength during earthquake-induced ground motion. Occurs in loose, saturated, clean sand where ground shaking increases effective pore pressure resulting in the displacement of individual sand grains and groundwater. The soil transforms into a fluid-like state, allowing displacement of water and the potential mobilization of sand if not confined.

Spartina (alterniflora): Smooth cordgrass, an *invasive species*.

special status species: Collective term for endangered species, threatened species, species of concern and species of special concern.

species of concern (*federal definition*): An informal term that refers to those species which USFWS believes might be in need of concentrated conservation actions. (Formerly known as Category 1 or 2 Candidate).

species of special concern *(state definition)*: *Native species* or subspecies that have become vulnerable to extinction because of declining population levels, limited ranges, or rarity. The goal is to prevent these animals and plants from becoming endangered by addressing the issues of concern early enough to secure long term viability for these species.

specific yield: A measure of aquifer productivity; the volume of water drained divided by the total volume of the sample.

spring tides: The tides resulting when the gravitational forces exerted on the earth by the sun and moon are acting in the same direction.

stillwater flood elevation: Projected elevation that flood waters would assume in the absence of waves resulting from wind or seismic effects.

streambed: A channel occupied (or formerly occupied) by a stream.

strike slip fault: A fault on which the movement is parallel to the fault's strike (the direction taken by a structural surface, *e.g.*, a bedding or fault plane, as it intersects the horizontal).

submerged plants: Plants growing with their root, stems, and leaves completely under the surface of the water.

submerged: Below water.

subsidence: The motion of a surface (usually, the Earth's surface) as it shifts downward relative to a datum such as sea level.

subtidal habitat: Areas below mean lower low water (*MLLW*) that are covered by water most of the time.

swamp: A seasonally flooded bottomland with more woody plants than a marsh and better drainage than a bog.

tectonically: Pertaining to the forces involved in, or the resulting structures of geology dealing with the broad architecture of the outer part of the earth, that is, the major structural or deformational features and their relations, origin, and historical evolution.

teratogenicity: The capacity to cause birth defects.

tertiary wastewater treatment: Selected biological, physical, and chemical separation processes to remove organic and inorganic substances that resist conventional treatment processes; the additional treatment of effluent beyond that of primary and secondary treatment methods to obtain a very high quality of effluent.

threatened (*federal definition*): Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

threatened *(state definition)*: A native species or subspecies of a bird, *mammal*, fish, *amphibian*, reptile, or plant that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of the special protection and management efforts.

tidal dispersion: The transportation of a water parcel resulting from the spatial and temporal variability in the speed and direction of tidal currents.

tidal excursion: The horizontal distance a particle or water parcel travels during a single flood or ebb tide.

tidal marsh: Wetlands with fresh water, *brackish* water, or salt water along tidal shores.

tidal mud flat: The unvegetated shoreline area exposed to air during low tide.

tidal muting: The restriction of tidal flow by friction; contributes to channel shape and form as a result of erosion and sedimentation.

tidal prism: The volume of water that flows into and out of a marsh.

topography: The general configuration of a land surface, including its relief and the position of its natural and man-made features.

Total Maximum Daily Load program: A quantitative assessment, provided for in the Clean Water Act, of a problem that affects water quality. Establishes the amount of a pollutant present in a water body and

specifies an allowable load of the pollutant from individual sources to ensure compliance with water quality standards.

toxic air contaminant: The classification, under California law, for a pollutant that increases the public's risk of developing cancer. See also *hazardous air pollutant*.

toxic: The property of being poisonous, of causing death or severe temporary or permanent damage to an organism.

toxicity: The degree to which a substance is *toxic*.

trophic level: Stage in a food chain or web leading from primary producers (lowest trophic level) through herbivores to primary and secondary carnivores (consumers—highest level).

tsunami: A seismically induced flood caused by the transfer of energy from an earthquake epicenter to coastal areas by ocean waves.

turbidity: The relative clarity of water, which depends in part on the material in suspension in the water.

upland: Ground elevated above the lowlands along rivers or shorelines.

upper tidal marsh: Habitat that occurs from mean high higher water and up several feet (>6.0 feet National Annual Vertical Datum 88) to the maximum elevation of tidal effects. This habitat is inundated only during higher high tides.

vascular plant: Green plant having a vascular system: ferns, gymnosperms, angiosperms.

vector: An insect or other organism that transmits a pathogenic fungus, virus, bacterium, etc.

watershed: An area of land where all of the ground water and surface water drains to the same water body (typically a river or creek).

zooplankton: Floating and free-swimming invertebrates that are suspended in the water column.

7. REFERENCES

Abu-Saba K, Ogle S. 2005. Selenium in San Francisco Bay, Conceptual Model/Impairment Assessment. Final Report.

Accurso, L. M. (1992). Distribution and abundance of wintering waterfowl on San Francisco Bay 1988-1990. Arcata, CA, Humboldt State University: 252.

Acker, Nicole. 2004. City of Menlo Park Police Department, Administrative Assistant. Personal Communication, September 13, 2004.

Adelson, Mitch. Cartographer. US Geological Survey, Western Region Geospatial Information Office. Menlo Park, CA. July 22, 2005 – email exchange with Sue Chau of EDAW regarding tsunamis in San Francisco Bay.

Ainley, D. G. (2000). Double-crested Cormorant. Goals Project. *Baylands Ecosystem Species and Community Profiles: Life Histories and Environmental Requirements of Key Plants, Fish and Wildlife. P. Olofson. Oakland, California, San Francisco Bay Area Wetlands Ecosystem Goals Project*. San Francisco Bay Regional Water Quality Control Board: 323-324.

Alameda County Mosquito Abatement District. 1999. Alameda County Mosquito abatement district control program.

Alameda County Water District (ACWD). 2005. ACWD Fact Sheet (http://www.acwd.org/acwd-factsheet.html), accessed by Suet Chau, EDAW, Inc., September 28, 2005

Alameda County Water District. 2001. Groundwater Management Policy (Adopted January 26, 1989) (Amended March 22, 2001), Fremont, CA.

Alameda County Water District. 2004. Destruction of Abandoned Water Wells within the South Bay Salt Pond Restoration Project. In: S. Ritchie (Editor), Fremont.

Alameda County Water District. 2005. Urban Water Management Plan 2006-2010, Fremont, CA.

Alameda County Water District. 2006. Groundwater Monitoring Report 2005, Fremont, CA.

Alameda County. 1995. Alameda County General Plan.

Alameda-Contra Costa Transit (AC) District. 2006. *Bus System and Street Map Hayward/San Leandro*.

Alanen AR, Melnick RZ, eds. 2000. *Preserving Cultural Landscapes in America*. Johns Hopkins University Press, Baltimore, Maryland.

Albertson, J. D. (1995). Ecology of the California Clapper Rail in South San Francisco Bay. San Francisco, CA, Unpubl. Masters Thesis: San Francisco State University: 199.

Allen, S. G., D. G. Ainley, et al. (1984). "The effect of disturbance on harbor seal haulout pattern at Bolinas Lagoon, California." *U.S. Fish Bull* 82: 493-500.

Allied Waste Services. 2005. Personal communication with receptionist, September 30, 2005.

Ananian B. 1985. *An Archaeological Reconnaissance of 1200 Acres Associated with the Proposed Shorelands Project Hayward, Alameda County, California*. Report on file, Northwest Information Center, Rohnert Park, California.

Anderson, W. (1970). "A preliminary study of the relationship of saltponds and wildlife - south San Francisco Bay." *California Fish and Game* 56(4): 240-252.

Anttila, C. K., C. C. Daehler, et al. (1998). "Greater male fitness of a rare invader (*Spartina alterniflora*, Poaceae) threatens a common native (*Spartina foliosa*) with hybridization." *American Journal of Botany* 85(11): 1597-1601.

Association of Bay Area Governments. 2005. *Forecasts for the San Francisco Bay Area to The Year 2030 – Projections 2005*.

Atwater BF, Conrad SG, Dowden JN, Hedel CW, MacDonald RL, Savage W. 1979. History, Landforms, and Vegetation of the Estuary's Tidal Marshes. In: Conomos TJ, editor. San Francisco Bay: The Urbanized Estuary. San Francisco, CA: Pacific Division, American Association for the Advancement of Science. p 347-385.

Atwater BF, Hedel CW. 1976. *Distribution of Seed Plants with Respect to Tide Levels and Water Salinity in the Natural Tidal Marshes of the Northern San Francisco Bay Estuary, California.* U.S. Geological Survey Open-File Report 76-389. On file at U.S.G.S. Inquiries Office, 555 Battery Street, San Francisco.

Atwater BF, Helley EJ, Hedel CW. 1977. *Late Quaternary Depositional History, Holocene Sea-Level changes, and Vertical Crustal Movement, Southern San Francisco Bay, California*. U.S. Geological Survey Professional Paper 1014. Washington: Government Printing Office. 15 pp.

Atwater, B. F. (1979). Ancient processes at the site of southern San Francisco Bay: movement of the crust and changes in sea level. *San Francisco Bay: the urbanized estuary*. T. J. Conomos. Menlo Park, CA, U.S. Geological Survey Open File Report 76-389.

Austin, J. E., C. M. Custer, et al. (1998). Lesser Scaup (*Aythya affinis*). *The Birds of North America, No. 338*. A. Poole and F. Gill. Philadelphia, Pennsylvania, The Birds of North America, Inc.

Ayres, D. R. and D.R.Strong (2004). *Hybrid cordgrass (Spartina) and tidal marsh restoration in San Francisco Bay: If you build it, they will come*. Third International Conference on Invasive Spartina, San Francisco, CA.

Bailey SF, Eliason DA, et al. 1965. "Flight and dispersal of the mosquito *Culex tarsalis* Coquillett in the Sacramento Valley of California." *Hilgardia* 37(3): 73-113.

Bakun WH, 1999. Seismic activity of the San Francisco Bay region: Bulletin of the Seismological Society of America. v. 89, p. 764-784.

Basin Research Associates, Inc. 1995. *Cultural Resources Assessment, Alviso Master Plan Area, City of San Jose, Santa Clara County, California.* Report on file, Northwest Information Center, Rohnert Park, California.

Basin Research Associates, Inc. 2004. *Cultural Resources Review Rincon De Los Esteros Redevelopment Area North San Jose Environmental Impact Report Proposed Residential Areas and Urban Industrial Core Area City of San Jose, Santa Clara County, California*. Report on file, Northwest Information Center, Rohnert Park, California.Baxter RS, Beck R. 2001. Department of Parks and Recreation site record forms for CA-ALA-593H/P-01-02257. On file, Northwest Information Center, Rohnert Park, California.

Baxter, R. K., K. DeLeon, et al. (1999). Report on the 1980-1995 fish, shrimp, and crab sampling in the San Francisco Estuary, California, California Department of Fish and Game. Interagency Ecological Program for the Sacramento - San Joaquin Estuary.

Bay Area Air Quality Management District (BAAQMD). 1999. CEQA Guidelines.

Bay Area Air Quality Management District (BAAQMD). 2000 (December 20). *Bay Area 2000 Clean Air Plan and Triennial Assessment.*

Bay Area Air Quality Management District (BAAQMD). 2006 (January 4). Bay Area 2005 Ozone Strategy. Available at: http://www.baaqmd.gov/pln/plans/ozone/2005_strategy/index.htm.

Bay Conservation and Development Commission. 2005a. Shoreline Spaces Public Access Design Guidelines for the San Francisco Bay.

Baye, P. R. (2004). "A review and assessment of potential long-term ecological consequences of the introduced cordgrass Spartina alterniflora in the San Francisco Estuary (in Prep)." *CALFED on-line journal*.

Beardsley RK. 1954. *Temporal and Areal Relationships in Central California Archaeology*. Berkeley: University of California Archaeological Survey Reports 24, 25.

Beck W A, Haase YD. 1974. *Historical Atlas of California*. University of Oklahoma Press.

Bell, N. W. (Unpublished). Data collected by Norton Bell, Don Edwards San Francisco Bay National Wildlife Refuge volunteer, on harbor seal numbers near the mouth of Alviso Slough in 2004.

Bennyhoff JA, Fredrickson DA. 1969. *A Proposed Integrative Taxonomic System for Central California Archaeology*. Contributions of the University of California Archaeological Research Facility, Berkeley 52:15–24.

Bennyhoff JA. 1968. *A Delta Intrusion to the Bay in the Late Middle Period in Central California*. San Diego: Paper presented at the Annual Meeting of the Society for California Archaeology and the Southwestern Anthropological Association.

Bennyhoff JA. 1977. *Ethnogeography of the Plains Miwok*. University of California, Center for Archaeological Research at Davis, Publications 5.

Bennyhoff JA. 1982. *Central California Augustine: Implications for Northern California Archaeology*. Contributions of the University of California Archaeological Research Facility, Berkeley 52:65–74.

Benoit J, Gilmour C, Heyes A, Mason RP, Miller C. 2003. Geochemical and biological controls over methylmercury production and degradation in aquatic ecosystems, in *Biochemistry of Environmentally Important Trace Element*. In: Y. Chai and O.C. Braids (eds.) (Editors), American Chemical Society, Washington, D.C., pp. 262-297.

Benoit J, Gilmour C, Mason R, Riedel G, Riedel G. 1998. Behavior of mercury in the Patuxent river estuary. Biogeochemistry, 40(2-3): 249-265.

Bickel PMcW. 1978. Changing Sea Levels Along the California Coast: Anthropological Implications. *Journal of California Anthropology* Volume 5 No. 1. Pp 6-20.

Bickel PMcW. 1981. *San Francisco Bay Archaeology: Sites Ala-328, Ala-13 and Ala-12.* Contributions of the University of California Archaeological Research Facility, Berkeley 43.

Billat L. 2000. *Nextel Communications Wireless Telecommunications Service Facility – San Mateo County*. Letter report on file at the Northwest Information Center, Rohnert Park, California.

Birnbaum CA. 1994. *Protecting Cultural Landscapes: Planning, Treatment and Management of Historic Landscapes*. Preservation Briefs 36. Preservation Assistance, Cultural Resources, National Park Service, U.S. Department of the Interior, Washington, D.C.

Bishop, Shaun. 2007 (July 7). Century 12 talks to be extended. Published in the Redwood Daily News.

Blackmar FW. 1976. *Spanish Institutions of the Southwest*. Rio Grande Press, Glorieta, New Mexico.

Bloom AL. 1971. Glacial-Eustatic and Isostatic Controls of Sea Level Since the Last Glaciation. In The Late Cenozoic Glacial Ages. Yale University Press, New Haven.

Bohart RM, Washino RK. 1978. *Mosquitoes of California*, 3rd Edition. Univ. Calif. Div. Agr. Sci., Berkeley, Publ. 4084. 153 pp.

Borrero J, Dengler L, Uslu B, Synolakis C. 2006. Numerical Modeling of Tsunami Effects at Marine Oil Terminals in San Francisco Bay. Prepared for: Marine Facilities Division of the California State Lands Commission. 37 p.

Brodberg RK, Pollock GA. 1999. Prevalence of Selected Target Chemical Contaminants in Sport Fish from Two California Lakes: Public Health Designed Screening Study. EPA Assistance Agreement CX 825856-01-0, Office of Environmental Health Hazard Assessment, Sacramento, California.

Brown & Caldwell, PWA, H. T. Harvey & Associates, GAIA Consulting Inc. 2005. Moffett Field Storm Water Retention Pond Tidal Restoration Feasibility Study. Prepared for NASA Ames Research Center.

Brown and Caldwell, PWA, EDAW, H. T. Harvey & Associates. 2005. Water and Sediment Quality Existing Conditions Report. San Francisco, CA.: Prepared for: California State Coastal Conservancy, US Fish and Wildlife Service, California Department of Fish and Game.

Bryant, Keith. 2004. Sergeant Hayward Police Department. Personal communication, September 14, 2004.

Buchanan P. 1999. Specific conductance, water temperature, and water level data, San Francisco Bay, California, water year 1998. Interagency Ecological Program Newsletter 12(4):46-51.

Buchanan PA, Schoellhamer DH. 1999. Summary of suspended-solids concentration data in San Francisco Bay, California, water year 1997. US Geological Survey. Report nr 99-189. 52 p.

Buchanan PA. 2003. Specific-conductance, water-temperature, and water-level data, San Francisco Bay, California, water years 2001-2002. Interagency Ecological Program Newsletter 16(4):25-30.

Buchanan, J. B. (2003). "*Spartina* invasion of pacific Coast estuaries in the United States: implications for shorebird conservation." *Wader Study Group Bulletin* 100: 47-49.

Burger, J. and M. Gochfeld (1991). "Human activity influence and diurnal and nocturnal foraging of Sanderlings (Calidris alba)." *Condor* 93: 259-265.

Burger, J. and M. Gochfeld (2002). Bonaparte's Gull (*Larus philadelphia*). *The Birds of North America, No. 634*. A. Poole and F. Gill. Philadelphia, Pennsylvania, The Birds of North America, Inc.

Burger, J., C. Jeitner, et al. (2004). "The effect of human activities on migrant shorebirds: successful adaptive management." *Environmental Conservation* 31(4): 283-288.

Burton, N. H. K., M. M. Rehfisch, et al. (2006). "Impacts of sudden winter habitat loss on the body condition and survival of Redshank *Tringa tetanus*." *Journal of Applied Ecology* 43: 464-473.

Butler PF. 1981. *The Valley of Santa Clara Historic Buildings, 1792–1920*. Presidio Press, Novato, California.

Byrne, R., S. Ingram, et al. (2001). "Carbon-isotoope, diatom, and pollen evidence for late Holocene salinity change in a brackish marsh in the San Francisco Estuary." *Quaternary Research* 55: 66-76.

CALFED Bay Delta Authority. 2001. *CALFED ERP; Draft Stage 1 Implementation Plan.*

CALFED Bay-Delta Program. 2000. *Ecosystem Restoration Program Plan Strategic Plan for Ecosystem Restoration*.

CALFED Bay-Delta Program. 2000. *Final Programmatic Environmental Impact Statement / Environmental Impact Report*.

California Air Resource Board (CARB). 2003. *State and National Area Designations*. Available at http://www.arb.ca.gov/desig/adm/adm.htm#state. Accessed August 2006.

California Air Resources Board (CARB). 2003. HARP User Guide. Sacramento, CA

California Air Resources Board (CARB). 2005. Air Quality and Land Use Handbook: A Community Health Perspective. Sacramento, CA.

California Air Resources Board (CARB). 2006. Area Designation Maps / State and National. Available at www.arb.ca.gov/desig/adm/adm.htm#state. Accessed August 2006.

California Air Resources Board (CARB). 2006a. *California Almanac of Emissions and Air Quality 2006 Edition.* Available at http://www.arb.ca.gov/app/emsinv/emseic1_query.php?F_DIV=-4&F_YR=2005&F_SEASON=A&SP=2006&F_AREA=AB&F_AB=SF&F_DD=Y Accessed August 2006.

California Air Resources Board (CARB). 2006b. *2005 Estimated Annual Average Emissions.San Francisco Bay Area Air Basin.*

California Air Resources Board (CARB). 2006c. *Air Quality Data Summaries - Top 4 Summary: Select Pollutant, Years, and Area.* Available at http://www.arb.ca.gov/adam/cgi-bin/db2www/adamtop4b.d2w/start

California Air Resources Board (CARB). 2006d. *Ambient Air Quality Standards*. Available at: http://www.arb.ca.gov/aqs/aaqs2.pdf. May 17.

California Department of Fish and Game (2004). RareFind: California Department of Fish and Game Natural Diversity Database (CNDDB). Sacramento, California Department of Fish and Game, Wildlife and Habitat Data Analysis Branch: Special-status animals, vascular plants, bryophytes, lichens, and sensitive habitats.

California Department of Fish and Game (2006). RareFind: California Department of Fish and Game Natural Diversity Database (CNDDB). Sacramento, California Department of Fish and Game, Wildlife and Habitat Data Analysis Branch: Special-status animals, vascular plants, bryophytes, lichens, and sensitive habitats.

California Department of Fish and Game and US Fish and Wildlife Service. 2003. South Bay Salt Ponds Initial Stewardship Plan, Draft Environmental Impact Report/Environmental Impact Statement.

California Department of Fish and Game. 2005. 2004 Self-Monitoring Report Baumberg Complex. Order No. R2-2004-0018, WDID No. 2 019438001., Hayward, CA.

California Department of Transportation (Caltrans). 1998. *Traffic Noise Analysis Protocol: Technical Noise Supplement.* Sacramento, CA. October.

California Department of Transportation (Caltrans). 2002. Transportation Related Earthborne Vibrations. Sacramento, CA.

California Department of Transportation (Caltrans). 2006. *Traffic and Vehicle Data Systems Unit 2005 All Traffic Volumes on CSHS.* Available: <http://traffic-counts.dot.ca.gov/2005all/ >

California Department of Water Resources. 2003. California's Groundwater; Bulletin 118 Update 2003; San Francisco Bay Hydrologic Region, State of California; The Resources Agency; Department of Water Resources.

California Geological Survey. 1997. California Public Resources Code, Division 2. Geology, Mines, and Mining. Article 7.5.

California Public Utilities Commission. 2006. General Order No. 95 Rules for Overhead Electric Line Construction. State of California.

California Regional Water Quality Control Board San Francisco Bay Region (1995). Water Quality Control Plan. Oakland, CA, *http://www.swrcb.ca.gov/rwqcb2/basinplan.htm*.

California State Coastal Conservancy and US Fish and Wildlife Service. 2003. *San Francisco Estuary Invasive Spartina Project: Spartina Control Program. VOLUME 1: Final Programmatic Environmental Impact Statement/Environmental Impact Report.*

Callaway 2007. E-mail to Donna Ball (H. T. Harvey & Associates) describing sedimentation rates and anecdotal account of gypsum break-up at Pond A21.

Callaway, J. C. (1990). The introduction of *Spartina alterniflora* in South San Francisco Bay, San Francisco State University: 50.

Callaway, J. C. and M. Josselyn (1992). "The introduction and spread of smooth cordgrass *Spartina alterniflora* in South San Francisco Bay." *Estuaries* 15(2): 218-226.

Carney, K. M. and W. J. Sydeman (1999). "A review of human disturbance effects on nesting colonial waterbirds." *Waterbirds* 22: 68-79.

Carpelan, L. H. (1957). "Hydrobiology of the Alviso salt ponds." *Ecology* 38(3): 375-390.

Cheng RT, Casulli V, Gartner JW. 1993. Tidal, residual, intertidal mudflat (TRIM) model and its applications to San-Francisco Bay, California. Estuarine, Coastal, and Shelf Science 36(3):p235-280.

Cheng RT, Gartner JW. 1985. Harmonic Analysis of tides and tidal Currents in South San Francisco Bay, California. Estuarine, Coastal, and Shelf Science 21:p57-74.

Chivers B. 1981. Historic Hangar No. 1. *The Trailblazer*, 21: 3-6.

City of East Palo Alto. 1999. *City of East Palo Alto General Plan*.

City of East Palo Alto. 2003. City of East Palo Alto Municipal Code (up to date through Ordinance 276, passed November 18, 2003). http://municipalcodes.lexisnexis.com/codes/epaloalto/), accessed by Suet Chau, EDAW, Inc.: LexisNexis.

City of Fremont. 1991. *Fremont General Plan.*

City of Fremont. 2003. Fremont General Plan, Public Facilities Element.

City of Fremont. 2007 (June). City of Fremont Development Activity List. (http://www.ci.fremont.ca.us/NR/rdonlyres/ecuxlapha4mzoxugnputr4q7x7gfhvh3q3qebziujjod24ggogobsbs7sb2n33tznq2fxtw4vxbva2xrowxdaqldq4a/DevelopmentActivityWebVersion.pdf), accessed by Suet Chau, EDAW, Inc.

City of Fremont. 2007 (August 22 [accessed]). Oakland A's. http://www.ci.fremont.ca.us/Community/OaklandA/default.htm.

City of Hayward Community and Economic Development Department. 2006. *Hayward Plan Land Use Map.*

City of Hayward. 2002. City of Hayward General Plan, Adopted by City Council on March 12, 2002, last amended on October 21, 2003. Available at http://www.ci.hayward.ca.us/about/general.shtm.

City of Hayward. 2003. City of Hayward General Plan.

City of Hayward. 2003. Hayward Municipal Code (current through Ordinance 04-04). LexisNexis, copyright 2003 Book Publishing Company. Available at http://www.bpcnet.com/codes/hayward/, accessed by Suet Chau, EDAW, Inc.

City of Hayward. 2004. City of Hayward Public Works Division webpage (http://www.ci.hayward.ca.us/departments/publicworks/dpublicworks.shtm), accessed by Suet Chau, EDAW, Inc., September 28, 2005

City of Hayward. 2004. City of Hayward website, http://www.ci.hayward.ca.us.

City of Menlo Park. 1994. City of Menlo Park General Plan Policy Document, adopted November 30 and December 1, 1994.

City of Menlo Park. 1994. City of Menlo Park General Plan Policy Document.

City of Menlo Park. 2004. Menlo Park Municipal Code (current through Ordinance 927 and the March, 2004 supplement code update). LexisNexis, copyright 2004 Book Publishing Company. p Available at http://ordlink.com/codes/menlopark/index.htm, accessed by Suet Chau, EDAW, Inc.

City of Milpitas. 1994. *Milpitas General Plan.*

City of Mountain View. 1992. City of Mountain View 1992 General Plan.

City of Mountain View. 2003. Mountain View City Code (current through Ordinance 1.04 and the February, 2004 code update). LexisNexis, copyright 2003 Book Publishing Company. Available at http://bpc.iserver.net/codes/mtnview/index.htm, accessed by Suet Chau, EDAW, Inc., July 8, 2004.

City of Newark. 1992. City of Newark General Plan Update Project 2007.

City of Palo Alto. 1998. *Palo Alto Comprehensive Plan*. (http://www.city.palo-alto.ca.us/compplan/), accessed by Suet Chau, EDAW, Inc. September 29, 2005

City of Palo Alto. 2003. City of Palo Alto Fire Department Profile Webpage (http://www.cityofpaloalto.org/fire/profile/index.html), accessed by Suet Chau, EDAW, Inc. September 29, 2005 (Last reviewed January 29, 2003).

City of Palo Alto. No Date (Code is current to October 11, 2006). City of Palo Alto Municipal Code. Available: < http://nt2.scbbs.com/cgi-bin/om_isapi.dll?clientID=115989&infobase=procode-3&softpage=Browse_Frame_Pg>.

City of Redwood City. 1990 (Adopted January 22). *Redwood City Strategic General Plan,* Available <http://www.redwoodcity.org/cds/planning/generalplan1990.html>.

City of Redwood City. 2003. City Code of Redwood City (current through Ordinance 2255 and the September, 2003 code update). LexisNexis, copyright 2003 Book Publishing Company. Available at http://ordlink.com/codes/redwoodci/index.htm, accessed by Suet Chau, EDAW, Inc.

City of Redwood City. 2007 (August 22 [accessed]). Peninsula Park. http://www.redwoodcity.org/cds/planning/peninsulapark/overview.html.

City of San Jose. 1998. *Alviso Master Plan.*

City of San Jose. 2004. San Jose 2020 General Plan (http://www.sanjoseca.gov/planning/gp/2020_text/index_htm.htm), amended July 15, 2004.

City of San Jose. 2005. *San Jose Municipal Code.* Adopted December 13. American Legal Publishing Corporation, copyright 2005.

City of Santa Clara. 2002. *City of Santa Clara General Plan 2000 - 2010*.

City of Santa Clara. 2007 (July 10). Agenda Report. http://www.ci.santa-clara.ca.us/pdf/collateral/49ers-20070710-Agenda-Rpt-Proposed-Development-of-11-Acres.pdf.City of Sunnyvale. 1990. City of Sunnyvale General Plan. *1990 Community Design Element, 1992 Open Space Element, 1997 Land Use and Transportation Element*.

City of Sunnyvale. 1995. City of Sunnyvale General Plan.

City of Union City. 2002. *2002 General Plan Policy Document.*

Clarke JL. 1943. "Studies of the flight range of mosquitoes." *J. Econ. Ent.* 36: 121-122.

Cleland RG. 1944. *From Wilderness to Empire: a History of California, 1542-1900*. Alfred A. Knopf, Inc., New York, NY.

Cloern J, Powell T, Huzzey L. 1989. Spatial and temporal variability in South San Francisco Bay (USA). 2. Temporal changes in salinity, suspended sediments, and phytoplankton biomass and productivity over tidal time scales. Estuarine, Coastal and Shelf Science 28(6):599-613.

Cloern J. 1999. The relative importance of light and nutrient limitation of phytoplankton growth: a simple index of coastal ecosystem sensitivity to nutrient enrichment. Aquatic Ecology, 33: 3-16.

Cloern J. 2001. Our evolving conceptual model of the coastal eutrophication problem. Marine Ecology-Progress Series, 210: 223-253.

Coastal Conservancy/US Fish and Wildlife Service. *Invasive Spartina Project: Spartina Control Program*

Cogswell, H. L. (2000). The use of salt ponds by some selected birds other than shorebirds and waterfowl. *Goals Project. Baylands Ecosystem Species and Community Profiles: Life Histories and Environmental Requirements of Key Plants, Fish and Wildlife. P. R. Olofson. Oakland, CA, San Francisco Bay Area Wetlands Ecosystem Goals Project*. San Francisco Bay Regional Water Quality Control Board: 390-402.

Collins, J N and R M Grossinger (2004). Synthesis of scientific knowledge concerning estuarine landscapes and related habitats of the South Bay Ecosystem. *Technical report of the South Bay Salt Pond Restoration Project*. Oakland, CA, San Francisco Estuary Institute: 91 p.

Collins, J. N. (2004). Maintaining and improving functioning of the South Bay ecosystem and restoring tidal salt marsh and associated habitats over the next 50 years at pond and pond-complex levels. *Unpublished science synthesis for the Science Team of the South Bay Salt Pond Restoration Project*.

Connor M, Davis J, Leatherbarrow J, Werme C. 2004. Legacy Pesticides in San Francisco Bay. Conceptual Model/Impairment Assessment. Final Report.

Cook SF. 1955. *The Aboriginal Population of the San Joaquin Valley, California*. Anthropological Records 16:2. University of California Press. Berkeley California.

County of San Mateo. 1986. *San Mateo General Plan.*

County of Santa Clara. 1994. The Santa Clara County General Plan, 1995-2010 adopted December 20, 1994. Available at http://www.sccplanning.org/planning/content/PlansPolicy/PlansPolicy_General_Plan.jsp

Cullen, S. A., J. R. Jehl, Jr., et al. (1999). Eared Grebe (Podiceps nigricollis). *In The Birds of North America, No. 433*. A. Poole and F. Gill. Philadelphia, Pennsylvania, The Birds of North America, Inc.

Daehler, C. C. and D. R. Strong (1996). *Alien Cordgrasses in Pacific estuaries*. Proceedings Cal EPPC Symposium & Isquo; 95:25-28.

Daehler, C. C. and D. R. Strong (1997). "Hybridization between introduced smooth cordgrass (*Spartina alterniflora*; Poaceae) and native California cordgrass (*S. foliosa*) in San Francisco Bay, California, USA." *American Journal of Botany* 84(5): 607-611.

Davis J, Hetzel F, Oram J. 2006. PCBs in San Francisco Bay: Impairment Assessment/Conceptual Model Report. Final Report.

Depner, Linda. 2004. Crime Data Specialist, City of San Jose Police Department. Personal communication, September 15, 2004.

Dewey OL. 1989. *Drawbridge, California: A Hand-Me-Down History*. San Francisco Bay Wildlife Society, Fremont, California.

DJMH&N, EDAW, Page & Turnbull, BAE. 2002. *Shenandoah Historic District Development Plan*. Available http://researchpark.arc.nasa.gov/Public/publicDocs.html. Accessed August 2006.

Dodi, Mike. 2005. Senior Communications Operator, City of Hayward Police Department. Personal communication, September 28, 2005.

D'Onofrio D, Fenske L, Helmer G, Henstridge F, Ikehara M, King N, Sasagawa G. 2003. A Master Plan for a Modern California Geodetic Control Network. California Spatial Reference Center. 26 p.

Draft Technical Report. Santa Clara, California: Santa Clara Valley Water District.

Duffy, D. C., N. Atkins, et al. (1981). "Do shorebirds compete on their wintering grounds?" *Auk* 98(2): 215-229.

Durso SL. 1996. The Biology and Control of Mosquitoes in California. S. L. Durso, Mosquito and Vector Control Association of California, Elk Grove. 150 pp.

Earth Tech. 2006. Phase 1 Hazardous Substance Liability Assessment, Santa Clara Valley Water District, San Jose, California.

EDAW. 2005. South Bay Salt Pond Restoration Project Historic Contect Report. San Francisco, CA: Prepared for: California State Coastal Conservancy, US Fish and Wildlife Service, California Department of Fish and Game.

Egan, M. David. 1988. Architectural Acoustics. McGraw-Hill, Inc. New York, NY.

Ellsworth WL, 1990. Earthquake history. 1769-1989. in Wallace, R.E. (ed.), The San Andreas fault system, California: U.S. Geological Survey Professional Paper 1515, p. 153-187.

Emery KO. 1969. The Continental Shelves. Scientific American 221(3):353-359.

Environmental Laboratory (1987). *U.S. Army Corps of Engineers Wetlands Delineation Manual*. Vicksburg, MS, U.S. Army Corps of Engineers, Waterways Experiment Station.

Evans, P. R. (1986). "Use of the herbicide 'Dalapon' for control of *Spartina* encroaching on intertidal mudflats: beneficial effects on shorebirds." *Colonial Waterbirds* 9(2): 171-175.

Eyster, C., D. George, et al. (2003). Management plan for the salt ponds in the California Department of Fish and Game Moss Landing Wildlife Area, Monterey County, CA. Unpublished Report. Stinson Beach, California, PRBO Conservation Science.

Fancher, L. E. and D. J. Alcorn (1982). "Harbour seal census in South San Francisco Bay (1972-1977 and 1979-1980)." *Calif Fish and Game* 68(2): 118-121.

Federal Emergency Management Agency. 1981. Flood Insurance Study, City of Redwood City, CA, San Mateo County.

Federal Emergency Management Agency. 1988. Part 65 - Identification and Mapping of Special Hazard Areas, http://www.access.gpo.gov/nara/cfr/waisidx_03/44cfr65_03.html. 2003 CFR Title 44, Volume 1 - Emergency Management and Assistance: Federal Emergency Management Agency (FEMA).

Federal Emergency Management Agency. 1998a. Flood Insurance Study, City of San Jose. Volumes 1 and 2. Community number 060349.

Federal Emergency Management Agency. 1998b. Flood Insurance Study, Santa Clara County, CA, Unincorporated Areas, Volumes 1 and 2 of 2.

Federal Emergency Management Agency. 1999a. Flood Insurance Study, City of East Palo Alto, California, San Mateo County.

Federal Emergency Management Agency. 1999b. Flood Insurance Study, City of Palo Alto, California, San Mateo County.

Federal Emergency Management Agency. 2000. Flood Insurance Study, City of Newark, California, Alameda County.

Federal Emergency Management Agency. 2005. Final Draft Guidelines for Coastal Flood Hazard Analysis and Mapping for the Pacific Coast of the United States.

Federal Transit Administration (FTA). 1995. Transit Noise and Vibration Impact Assessment. Washington, D.C.

Feeney, L. R. and W. A. Maffei (1991). Snowy Plovers and their habitat at the Baumberg Area and Oliver Salt Ponds Hayward, California March 1989 through May 1990. Hayward, California, Report prepared for the City of Hayward: 162.

Fio JL, Leighton DA. 1995. Geohydrologic Framework, Historical Development of the Ground-Water system, and General Hydrologic and Water-Quality Conditions in 1990, South San Francisco Bay and Peninsula Area, California, U.S. Geological Survey; Bay Area Water Users Association, Sacramento, CA.

Fischer HB, Lawrence GA. 1983. Currents in South San Francisco Bay. State Water Resources Control Board, California. Report nr UCB/HEL-83/01.

Fischer, B. (1998). Western Snowy Plover breeding survey and nest characterization; Don Edwards San Francisco Bay National Wildlife Refuge 1998. Unpublished Report. Newark, California, San Francisco Bay National Wildlife Refuge Complex.

Foe C, Davis J, Schwarzback S, Stephenson M, Slottno D. 2003. Conceptual Model and Working Hypotheses of Mercury Bioaccumulation in the Bay-Delta Ecosystem and its Tributaries, California Bay-Delta Authority (CALFED), Sacramento, CA.

Fon, Genie. 2004. Administrative Assistant, Redwood City Police Department. Personal communication, September 14, 2004.

Foothill Disposal. 2004. Foothill Disposal Webpage (http://www.foothilldisposal.com/), accessed by Suet Chau, EDAW, Inc., September 30, 2005.

Foxgrover AC, Higgins SA, Ingraca MK, Jaffe BE, Smith RE. 2004. Deposition, erosion, and bathymetric change in South San Francisco Bay: 1858-1983.: US Geologic Survey Open-File Report 2004-1192. 25 p.

Foxgrover AC, Jaffe BE. 2005. South San Francisco Bay 2004 topographic lidar survey: data overview and preliminary quality assessment. Santa Cruz, CA: USGS Pacific Science Center. Report nr OFR 2005-1284.

Fredrickson DA. 1973. *Early Cultures of the North Coast Ranges, California*. Unpublished Ph.D. Dissertation. Department of Anthropology, University of California, Davis.

Fredrickson DA. 1974. Cultural Diversity in Early Central California: A View from the North Coast Ranges. *Journal of California Anthropology* 1(1):41–53.

Freeze RA, Cherry JA. 1979. Groundwater. Prentice Hall, Englewood Cliffs, NJ. 604 p.

Fremont Unified School District. 2005. Fremont Unified School District Directory of Schools Webpage (http://www.fremont.k12.ca.us/schoolsdirectory.html), accessed by Suet Chau, EDAW, Inc.

Frisbie Planning Company et. al., 2006 (September). Patterson Ranch Development and Environmental Preservation & Enhancement Plan.

Gifford EW. 1916. *Composition of California Shellmounds*. University of California Publications American Archaeology and Ethnology Vol. 12 No. 1.

Gifford EW. 1940. *Californian Bone Artifacts*. University of California-Archaeological Reports 3: 153-237.

Gill, R. J. (1977). "Breeding avifauna of the South San Francisco Bay estuary." *Western Birds* 8(1): 1-12.

Gilmour CC, et al. 1998. Methylmercury concentrations and production rates across a trophic gradient in the northern Everglades. Biogeochemistry, 40(2-3): 327-345.

Gilmour CC, Henry EA, Mitchell R. 1992. Sulfate stimulation of mercury methylation in freshwater sediments. Environmental Science & Technology, 26(11): 2281-2287.

Giroux, J. F. (1985). "Nest sites and superclutches of American Avocets on artificial island." *Canadian Journal of Zoology* 63: 1302-1305.

Goals Project (1999). Baylands Ecosystem Habitat Goals. A report of habitat recommendations prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project. First Reprint. San Francisco, CA/Oakland, CA, U.S. Environmental Protection Agency/San Francisco Bay Regional Water Quality Control Board: 209 p.

Goals Project (2000). *Baylands Ecosystem Species and Community Profiles: Life Histories and Environmental Requirements of Key Plants, Fish and Wildlife. Oakland, California, San Francisco Bay Area Wetlands Ecosystem Goals Project*. San Francisco Bay Regional Water Quality Control Board.

Godish, T. 1991. Air Quality. Lewis Publishers. Chelsea, MI.

Goss-Custard, J. D., A. D. West, et al. (2001). "Density-dependent starvation in a vertebrate without significant depletion." *Journal of Animal Ecology* 70: 955-965.

Goss-Custard, J. D., R. A. Jenyon, et al. (1977). "The ecology of the Wash II. Seasonal variation in the feeding conditions of wading birds (Charadrii)." *J. Appl. Ecol.* 14: 701-719.

Green Valley Disposal. 2002. Green Valley Disposal Webpage (http://www.greenvalley.com/), accessed by Suet Chau, EDAW, Inc., September 30, 2005.

Green, D. E., E. K. Grigg, et al. (2004). Monitoring the potential impact of the seismic retrofit construction activities at the Richmond-San Rafael Bridge on harbor seals (*Phoca vitulina*): May 1998 - March 2004. Incidental Harassment Authorization Interim Report submitted to NOAA/NMFS: 90.

Grindall, Terrence. 2007. City of Newark Community Development, Director. Personal Communication. December 5, 2007.

Gross E, Koseff J, Monismith S. 1999. Three-dimensional salinity simulations of south San Francisco Bay. Journal of Hydraulic Engineering - ASCE 125(11):1199-1209.

Gross E. 1997. Numerical modeling of hydrodynamics and scalar transport in an estuary [PhD Thesis]. Stanford, CA: Stanford University. 331 p.

Gross E., Schaaf & Wheeler. 2003a. Alviso Island Pond Breach Initial Stewardship Plan Study. South Bay Salt Ponds Initial Stewardship Plan, Draft Environmental Impact Report/Environmental Impact Statement, Technical Appendix K.: California Department of Fish and Game and US Fish and Wildlife Service.

Gross ES, Schaaf & Wheeler. 2003b. South Bay Salt Ponds Initial Stewardship Plan: South San Francisco Bay Hydrodynamic Model Calibration Report. Prepared for Cargill Salt.

Gross ES, Schaaf & Wheeler. 2003c. South Bay Salt Ponds Initial Stewardship Plan: South San Francisco Bay Hydrodynamic Model Results Report. Prepared for Cargill Salt.

Grossinger, R. M. (1995). Historical evidence of freshwater effects on the plan form of tidal marshlands in the Golden Gate Estuary, University of California at Santa Cruz.

Grossinger, R., J. Alexander, et al. (1998). Introduced Tidal Marsh Plants in the San Francisco Estuary: Regional Distribution and Priorities for Control. Richmond, California, San Francisco Estuary Institute.

Groundwater Committee of the California Regional Water Quality Control Board San Francisco Bay Region, Alameda County Water District and Santa Clara County Water District and San Mateo County Environmental Health Services Division. 2003. A Comprehensive Groundwater Protection Evaluation for the South San Francisco Bay Basins, www.swrcb.ca.gov/rwqcb2.

H. T. Harvey & Associates (1996). Westlake Farms, Inc., Mitigation Assessment Report. Unpublished Report for Westlake Farms, Inc., Stratford, CA. San Jose, California.

H. T. Harvey & Associates (2002). South San Francisco Bay Marsh Ecology: Tidal And Edaphic Characteristics Affecting Marsh Vegetation-Year 2. *Project no. 477-22*. San Jose, California, Prepared for City of San Jose: 32.

H. T. Harvey & Associates, PWA, et al. (2005). Biology and Habitats Existing Conditions Report. San Francisco, CA., Prepared for: California State Coastal Conservancy, U.S. Fish and Wildlife Service, California Department of Fish and Game.

Hall NT, Wright RH, and Clahan KB, 1999. Paleoseismic studies of the San Francisco peninsula segment of the San Andreas fault zone near Woodside, California: Journal of Geophysical Research, v. 104, No. B10, p. 23,215-23,236.

Hallenbeck C. 1926. *Spanish Missions of the Old Southwest*. Garden City, NY: Doubleday.

Hanson, J. T. and D. Kopec (1994). (revised 2004 by C.M. Strong). Shorebird location and activity during high tides in South San Francisco Bay, 1992-1993, Draft report for the San Francisco Estuary Project: 102.

Harrington MR. 1942. *Cultural Element Distributions, XIX: Central California Coast*. University of California Anthropological Publications 7(1):1-46.

Harrington, B. and E. Perry (1995). Important shorebird staging sites meeting Western Hemisphere Shorebird Reserve Network criteria in the United States. Washington, D.C., Department of Interior, Fish and Wildlife Service.

Hart EW, Bryant WA. 1997. Fault-rupture hazard zones in California, Department of Conservation, Division of Mines and Geology Special Publication, 42. p 32.

Harvey, H. T., H. L. Mason, et al. (1977). The marshes of San Francisco Bay: their attributes and values. San Francisco, California, Prepared for San Francisco Bay Conservation and Development Commission.

Harvey, T. E. (1988). "Breeding biology of the California Clapper Rail in south San Francisco Bay." *Trans. Western Section The Wildlife Society* 24: 98-104.

Harvey, T. E., P. R. Kelly, et al. (1988). *The value of saltponds for waterbirds in San Francisco Bay and considerations for future management*. Wetlands '88: Urban Wetlands and Riparian Habitat, Oakland, CA, Association of State Wetland Managers.

Harvey, T. E., R. L. Hothem, et al. (1992). Status and trends report on wildlife of the San Francisco Estuary, U.S. Fish and Wildlife Service.

Hayward Unified School District. n.d. Hayward Unified School District Webpage (http://www.husd.k12.ca.us/index.html), accessed by Suet Chau, EDAW, Inc., September 29, 2005.

Heizer RF, ed. 1974. The Costanoan Indians: The Indian Culture from the Mouth of the Sacramento River, South to Monterey and Inland Past the Salinas River. Cupertino, CA: California History Center.

Heizer RF. 1949. *The Archaeology of Central California I: The Early Horizon*. University of California Anthropological Records 12 (1).

Helley EJ, Lajoie KR, Spangle WE, Blair ML. 1979. Flatland deposits of the San Francisco Bay Region, California - Their geology and engineering properties, and their importance to comprehensive planning U.S. Geological Survey Professional Paper 943. 88 p.

Henry EA, Jacobs LA, Klein SM, Bigham GN, Gilmour CC. 1993. Bulk sediment vs. porewater concentrations of total and methylmercury in a contaminated lake (Onondaga Lake, NY). Society of Environmental Toxicology and Chemistry, Pensacola (USA) 14'th Annual Meeting, Society of Environmental Toxicology and Chemistry (SETAC) - Ecological Risk Assessment: Lessons Learned? Houston, TX (USA).

Hope A, Hylkema M, Van Buren T. 1996. *Archaeological Survey and Historical Resource Evaluation Report for the Baumberg Biological Mitigation Tract, Alameda County*. Report prepared for California Department of Transportation District 4 – Oakland.

Houston JRAWG. 1974. Type 16 Flood Insurance Study - WES Report H-74-3. USACE.

Houston JRAWG. 1980. Type 19 Flood Insurance Study - WES Report HL-80-18. USACE.

Howard AD. 1979. Geologic History of Middle California. University of California Press, Berkeley.

IPCC. 2001. Climate Change 2001: The Scientific Basis. Contribution of Working Group I to the Third Assessment Report of the Intergovernmental Panel on Climate Change. Houghton JT, Y. Ding, D.J. Griggs, M. Noguer, P.J. van der Linden, X. Dai, K. Maskell, C.A. Johnson (eds.), editor. Cambridge: Cambridge University Press. 881 p.

IPCC. 2007. Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Solomon S, Qin D, Manning M, Marquis M, Averyt K, Tignor MMB, Miller HL, Chen Z, editors. Cambridge, United Kingdom and New York, NY, USA: Cambridge University Press. 996 p.

Isola, C. R., M. A. Colwell, et al. (2000). "Interspecific differences in habitat use of shorebirds and waterfowl foraging in managed wetlands of California's San Joaquin Valley." *Waterbirds* 23: 196-203.

Jaffe BE, Foxgrover AF. in progress-a. Deposition and Erosion in South San Francisco Bay, California from 1956 to 2005. US Geological Survey. Report nr Open File Report.

Jaffe BE, Foxgrover AF. in progress-b. A history of tidal flat area in South San Francisco Bay, California, from 1858 to 2005. U.S Geological Survey Open File Report.

Jaffe BE, Fregoso T. in progress. Bulk density of near-surface sediments of South San Francisco Bay, California. U.S. Geological Survey. Report nr Open File Report.

Jassby A, Koseff J, SG M. 1996. Processes underlying phytoplankton variability in San Francisco Bay. In: Hollibaugh JT, editor. San Francisco Bay: The Ecosystem. San Francisco: AAAS. p 325-349.

Jehl, J. R., Jr. (1988). *Biology of the Eared Grebe and Wilson's Phalarope in the nonbreeding season: a study of adaptations to saline lakes Studies in Avian Biology No. 12*, Cooper Ornithological Society.

Jennings CW, Strand, RG, Rogers TH, Boylan RT, Moar RR, Switzer RA. 1977. Geologic Map of California.

Jennings, CW, 1994. Fault Activity map of California and adjacent areas with locations and ages of recent volcanic eruptions: California Division of Mines and Geology. Geologic Data Map No. 6. Sacramento. scale 1:750,000.

Johnson R. 2005. (ACPW) pers. comm. regarding ACFCC fluvial sediment source and sediment budget methodology first year progress report.

Jolly, Steve. 2005. Administrative Analyst, City of Hayward Fire Department. Personal communication, September 29, 2005.

Jones & Stokes. 2001. *Cultural Resources Inventory Report for the Habitat Mitigation Planning Sites, San Francisco International Airport Proposed Runway Reconfiguration Program*. Prepared for San Francisco International Airport.

Josselyn, M., B. Larsson, et al. (1993). An ecological comparison of an introduced marsh plant, *Spartina alterniflora*, with its native congener, *Spartina foliosa*, in San Francisco Bay. Tiburon, California, A Gaps in Knowledge Research Program, San Francisco Bay Estuary Project, Romberg Tiburon Centers, San Francisco State University: 47.

Kessel, B. D., A. Rocque, et al. (2002). Greater Scaup (*Aythya marila*). *The Birds of North America, No. 650*. A. Poole and F. Gill. Philadelphia, Pennsylvania, The Birds of North America, Inc.

Kinnetic Laboratories. 2001. Joint Stormwater Agency Project to Study Urban Sources of Mercury and PCBs. Kinnetic Laboratories, Inc. Santa Cruz, CA.

Kinnetic Laboratories. 2002. Joint Stormwater Agency Project to Study Urban Sources of Mercury and PCBs and Organo-chlorine Pesticides. April 2002. Kinnetic Laboratories, Inc. Santa Cruz, CA.

Kjelmyr, J., G. W. Page, et al. (1991). Shorebird numbers in wetlands of the Pacific Flyway: a summary of spring, fall, & winter counts in 1988, 1989, and 1990. Stinson Beach, CA, PRBO.

Kopec, A. D. and J. T. Harvey (1995). "Toxic pollutants, health indices and population dynamics of harbor seals in San Francisco Bay, 1989-1992." *Moss Landing Marine Laboratories Technical Pub.* 96-4: 138.

Krause, J. (2005). (CDFG) pers. comm. to S. Rottenborn at a meeting of the South Bay Salt Ponds Restoration Project Team, 10 January 2005.

Krause, John. 2004. Biologist, California Department of Fish and Game. Personal communication. August.

Kroeber AL. 1925. *Handbook of the Indians of California*. Bureau of American Ethnology Bulletin 78.

Kroeber AL. 1959. *Ethnographic Interpretations: 9. Recent Ethnic Spreads*. University of California Publications in American Archaeology and Ethnology 47(3).

Krone RB. 1979. Sedimentation in the San Francisco Bay System. In: Conomos TJ, editor. San Francisco Bay: The Urbanized Estuary. San Francisco, CA: Pacific Division, American Association for the Advancement of Science.

Krone RB. 1996. Recent Sedimentation in the San Francisco Bay System. In: Hollibaugh JT, editor. San Francisco Bay: The Ecosystem: Pacific Division of the American Association for the Advancement of Science.

Kushlan, J. A., M. J. Steinkamp, et al. (2002). *Waterbird conservation for the Americas: the North American Waterbird Conservation Plan, version 1*. Washington, D.C., Waterbird Conservation for the Americas.

Kyle D. 2002. *Historic Spots in California*. Stanford University Press, Stanford, California.

Lafferty, K. D. (2001). "Disturbance to wintering Western Snowy Plovers." *Biological Conservation* 101(3): 315-325.

Lafferty, K. D., D. Goodman, et al. (2006). "Restoration of breeding by snowy plovers following protection from disturbance." *Biodiversity and Conservation* 15: 2217-2230.

Laine, 2005. Interview with Josh Hohn, EDAW, Inc.

Laine, T. (2005). (Alviso resident) pers. comm. to S. Rottenborn,11 January 2005 meeting.

Lajoie KR. 1972. *Sediments of the Continental Shelf between Point Arena and Monterey Bay*. In Progress Report on the U.S.G.S. Quaternary Studies in the San Francisco Bay Area, Guidebook for Friends of the Pleistocene, 1972, by the U.S. Geological Survey staff and J.C. Cummins. On file at U.S. Geological Survey, Menlo Park.

Larsson, B. C. (2000). Franciscan brine shrimp. Goals Project. 2000. *Baylands Ecosystem Species and Community Profiles: Life Histories and Environmental Requirements of Key Plants, Fish and Wildlife. P. R. Olofson. Oakland, CA, San Francisco Bay Area Wetlands Ecosystem Goals Project*. San Francisco Bay Regional Water Quality Control Board: 151-152.

Lawson, AC, 1908. The California earthquake of April 18, 1906: Report of the State Earthquake Investigation Commission (Volume I): Carnegie Institution of Washington Publication No. 87.

Layne, V. L., R. J. Richmond, et al. (1996). "First nesting of Black Skimmers on San Francisco Bay." *Western Birds* 27(3): 159-162.

Levy R. 1978. Costanoan. In *Handbook of North American Indians, Vol. 8*. Smithsonian Institution, Washington, D.C.

Lidicker, W. Z. J. and D. G. Ainley (2000). Harbor seal, Phoca vitulina richardsi. *Goals Project. Baylands Ecosystem Species and Community Profiles: Life Histories and Environmental Requirements of Key Plants, Fish and Wildlife. P. R. Olofson. Oakland, San Francisco Bay Area Wetlands Ecosystem Goals Project*. San Francisco Bay Regional Water Quality Control Board: 243-246.

Life Science!. 2003. South Bay Salt Ponds Initial Stewardship Plan. Prepared for U.S. Fish and Wildlife Service and California Department of Fish and Game.

Life Science!. 2004. South Bay Salt Ponds Initial Stewardship Project: Environmental Impact Report/Environmental Impact Statement. Prepared for US Fish and Wildlife Service and California Department of Fish and Game.

Light Air and Space Construction (LA&S). 2004. Mercury Sediment Background Sampling Report, Lower Guadalupe River Flood Protection Project, Alviso, California.

Lightfoot KG. 1997. Cultural Construction of Coastal Landscapes: A Middle Holocene Perspective from San Francisco Bay. In *Archaeology of the California Coast during the Middle Holocene*, J.M. Erlandson and M.A. Glassow, eds. Perspectives in California Archaeology, Volume 4. Institute of Archaeology, University of California, Los Angeles.

Lillard JB, Heizer RF, Fenenga F. 1939. *An Introduction to the Archaeology of Central California*. Sacramento: Sacramento Junior College, Department of Anthropology Bulletin 2.

Lipscomb, DM, Taylor, Jr., AC. 1978. Noise Control: Handbook of Principles and Practices. Van Nostrand Rheinhold Company. New York, NY.

Lonzarich, D. G. and J. J. Smith (1997). "Water chemistry and community structure of saline and hypersaline salt evaporation ponds in San Francisco Bay, California." *Calif Fish and Game* 83(3): 89-104.

Lonzarich, D. J. (1989). Temporal and spatial variations in salt pond environments and implications for fish and invertebrates. San Jose, CA, San Jose State University.

Luhdorff & Scalmanini Consulting Engineers. 2003. East Bay Plain Aquifer Test Project. South East Bay Plain and Niles Cone Groundwater Basin.

Maffei WA. 2000. Summer Salt Marsh Mosquito, *Aedes dorsalis*. *Goals Project. Baylands Ecosystem Species and Communities Profiles: Life Histories and Environmental Requirements of Key Plants, Fish and Wildlife. P. R. Olofson. Oakland, CA, San Francisco Bay Area Wetlands Ecosystem Goals Project*. San Francisco Bay Regional Water Quality Control Board: 167-168.

Maffei WA. 2000. Washino's Mosquito, *Aedes washinoi*. *Goals Project. Baylands Ecosystem Species and Communities Profiles: Life Histories and Environmental Requirements of Key Plants, Fish and Wildlife. P. R. Olofson. Oakland, CA, San Francisco Bay Area Wetlands Ecosystem Goals Project*. San Francisco Bay Regional Water Quality Control Board: 172-173.

Maffei WA. 2000. Western Encephalitis Mosquito, *Culex tarsalis*. *Goals Project. Baylands Ecosystem Species and Communities Profiles: Life Histories and Environmental Requirements of Key Plants, Fish and Wildlife. P. R. Olofson. Oakland, CA, San Francisco Bay Area Wetlands Ecosystem Goals Project*. San Francisco Bay Regional Water Quality Control Board: 173-177.

Maffei WA. 2000. Winter Marsh Mosquito, *Culiseta inornata*. *Goals Project. Baylands Ecosystem Species and Communities Profiles: Life Histories and Environmental Requirements of Key Plants, Fish and Wildlife. P. R. Olofson. Oakland, CA, San Francisco Bay Area Wetlands Ecosystem Goals Project*. San Francisco Bay Regional Water Quality Control Board: 177-179.

Maffei WA. 2000. Winter Salt Marsh Mosquito, *Aedes squamiger*. *Goals Project. Baylands Ecosystem Species and Communities Profiles: Life Histories and Environmental Requirements of Key Plants, Fish and Wildlife. P. R. Olofson. Oakland, CA, San Francisco Bay Area Wetlands Goals Project*. San Francisco Bay Regional Water Quality Control Board: 169-172.

Maffei, W. A. (2000). Reticulate water boatman. *Goals Project. 2000. Baylands Ecosystem Species and Community Profiles: Life Histories and Environmental Requirements of Key Plants, Fish and Wildlife. P. Olofson. Oakland, CA, San Francisco Bay Area Wetlands Ecosystem Goals Project*. San Francisco Bay Regional Water Quality Control Board: 154-156.

Magoon OT. 1966. Structural damage by tsunamis. Specialty Conference on Coastal Engineering. Santa Barbara, CA: American Society Civil Engineers.

Margolin M. 1978. *The Ohlone Way: Indian Life in the San Francisco and Monterey Bay Areas*. Heyday Books, Berkeley.

Marvin DiPasquale MC, Agee JL, Bouse RM, Jaffe BE. 2003. Microbial cycling of mercury in contaminated pelagic and wetland sediments of San Pablo Bay, California. Environmental Geology, 43(3): 260-267.

Marvin-DiPasquale M, Unpublished. 2004. Microbial Mercury Cycling in San Francisco Bay Wetland Sediments: From Regions to Rhizospheres.

Matsuda, Linda. 2005. Senior Administrative Analyst. City of Mountain View Fire Station. Personal communication, September 30, 2005.

Maurer TC, Adelsbach TL. 2002. Phase 2 Report on Mercury and Trace Metal Concentrations in Sediment, Snails, and Fish from the Alviso Salt Evaporation Ponds, South San Francisco Bay, California.

May C, Koseff J, Lucas L, Cloern J, Schoellhamer D. 2003. Effects of spatial and temporal variability of turbidity on phytoplankton blooms. Marine Ecology-Progress Series 254:111-128.

May K, Abusaba K. 2007. Water Quality Approach Memorandum San Francisco, California: Prepared for: California State Coastal Conservancy, U.S. Fish and Wildlife Service, California Department of Fish and Game. May 31. 2007.

McClelland LF, Keller JT, Keller GP, Melnick RZ. 1999. *Guidelines for Evaluating and Documenting Rural Historic Landscapes*. National Register Bulletin. Cultural Resources, National Park Service, U.S. Department of the Interior, Washington, D.C.

McCulim, Shannon. 2004. Administrative Assistant, City of Fremont Fire Department. Personal communication, September 23, 2004.

McKee L, et al. 2006. Concentrations and Loads of Mercury, PCBs, and PBDEs in the Lower Guadalupe River, San Jose, California: Water Years 2003, 2004, and 2005. A Technical Report of the Regional Watershed Program: SFEI Contribution #424. San Francisco Estuary Institute, Oakland, CA.

McKee L, Ganju N, Schoellhammer D, Davis J, Yee D, Leatherbarrow J, Hoenicke R. 2002. Estimates of suspended-sediment flux entering San Francisco Bay from the Sacramento and San Joaquin Delta. San Francisco Estuary Institute. 28 p.

McKee L. 2005. San Francisco Estuary Institute Storm Water Sampling in Guadalupe River and Coyote Creek. In: Laura Marshall (Brown and Caldwell) (Editor).

McNicholl, M. K., P. E. Lowther, et al. (2001). Forster's Tern (Sterna forsteri). *The Birds of North America*. A. Poole and F. Gill, No. 595. Academy of Natural Sciences, Philadelphia, and American Ornithologists' Union, Washington, DC.

Meighan CW. 1955. *Archaeology of the North Coast Ranges, California*. University of California Archaeological Survey Reports 30:1–39. Berkeley, CA.

Menlo Park City School District. n.d. Menlo Park City School District Webpage (http://www.mpcsd.org/), accessed by Suet Chau, EDAW, Inc., September 30, 2005.

Metropolitan Transportation Commission. 2005. *Mobility for the Next Generation – Transportation 2030 Plan for the San Francisco Bay Area. Final.* February 2005. Available <http://www.mtc.ca.gov/planning/2030_plan/downloads/final_2030_plan/0-T2030Plan-final_FrontTOC.pdf>.

Mid-Peninsula Regional Open Space District. (http://www.openspace.org/preserves/pr_stevens_creek.asp) for the Stevens Creek Nature Study Area). Accessed by Marie Galvin on January 24, 2007.

Miles AK, et al. 2004. San Francisco Bay Estuary salt ponds progress report 2001-2003, USGS Priority Ecosystem Science Program USGS/USFWS (CNO) Science Support Program Unpubl. Rep., USGS Western Ecological Research Center, Sacramento, California.

Miles AK, Ricca MA, Spring SE. 2005a. Progress Report for Mercury in Sediments of the Alviso and Eden Landing Salt Ponds - Results from Winter 2005 Sampling, US Geological Survey.

Miles AK, Ricca MA, Spring SE, Stallings L. 2005b. Progress Report for Mercury in Sediments of the Alviso, Eden Landing, and Ravenswood Salt Ponds, US Geological Survey and Life Science! Inc.

Milliken R. 1995. *A Time of Little Choice: The Disintegration of Tribal Life in the San Francisco Bay Region*. Ballena Press Anthropological Papers No. 43. Menlo Park.

Milliken R. 1997. Ethnography of the Los Vaqueros Region. In *Native American History Studies for the Los Vaqueros Project: A Synthesis*. David Fredrickson et al., eds. Report Prepared for the Contra Costa Water District. On file, Anthropological Studies Center, Sonoma State University, Rohnert Park.

Milliman JD, Emery KO. 1968. Sea Levels During the Past 35,000 Years. *Science* 162:1121-1123.

Mitchell N. 1997. Protecting Landscapes: Contributions from Landscape Preservation to Management of Parks and Reserves. In *Making Protection Work: Proceedings of the Ninth [1997] Conference on Research and Resource Management in Parks and on Public Lands*, edited by David Harmon, 285-289. The George Wright Society, Hancock, Michigan.

Moffatt & Nichol Engineers. 2004. South Bay Salt Pond Restoration Project, Urban Levee Flood Management Requirements (Draft). 45 (text) p.

Moffatt & Nichol Engineers. 2005. Inventory of Water Conveyance Facilities: South Bay Salt Pond Restoration Project. California State Coastal Conservancy.

Monsen NE, Cloem JE, Lucas LV. 2002. A comment on the use of flushing time, residence time, and age as transport time scales. Limnol Oceanogr 47(5):1545-1553.

Moratto MJ. 1984. *California Archaeology*. Academic Press, San Francisco, CA.

Morris C. 2005. Manager, United States Fish and Wildlife Service. Interview with Josh Hohn, EDAW, Inc.

Morris. 2004. Manager, United States Fish and Wildlife Service. Telephone communication with Donna Plunkett, EDAW, Inc. regarding existing conditions at the project site.

Morris. 2006 (January 21). Manager, United States Fish and Wildlife Service. Telephone communication with Marie Galvin and Sue Chau.

Morris. 2006. Manager, United States Fish and Wildlife Service. Email to Michelle Orr. May 14.

Morrison, R. I. G., R. E. Gill, Jr., et al. (2001). Estimates of shorebird populations in North America. Ottawa, Canada, Canadian Wildlife Service.

Morrow P. 1978. *Drawbridge Field Study*. On file with the U.S. Fish and Wildlife Service, Don Edwards San Francisco Bay National Wildlife Refuge.

Morrow P. 1984. *Cause and Effect in the Development of a Unique Lifestyle*. Unpublished Master's thesis, Department of Anthropology, California State University, Hayward.

Morrow P. n.d. The Unique Hamlet of Drawbridge, California. *The Pacific Historian*. On file with the U.S. Fish and Wildlife Service, Don Edwards San Francisco Bay National Wildlife Refuge.

Mountain View Los Altos High School District, 2003. MVLA High School District (http://www.mvla.net/), accessed by Suet Chau, EDAW, Inc.

Mountain View- Whisman School District (MVWSD). n.d. Mountain View- Whisman School District – District Schools Webpage (http://www.mvwsd.k12.ca.us/schools.htm), accessed by Suet Chau, EDAW, Inc., September 29, 2005.

Mowbray, T. B. (2002). Canvasback (*Aythya valisineria*). *The Birds of North America, No. 659*. A. Poole and F. Gill. Philadelphia, Pennsylvania, The Birds of North America, Inc.

Mruz E. 2006. pers. comm. regarding summer 2006 Ponds A17 and A16 water control structure management.

Munro-Fraser JP. 1881. *History of Santa Clara County, California*. Alley, Bowen & Co., San Francisco.

NASA Ames Research Center. 2002. *NASA Ames Development Project.* December 2002. Available < http://researchpark.arc.nasa.gov/PublicDocs/NADP_Dec%2002.pdf>

National Ocean and Atmospheric Administration. 2007. The National Geodetic survey 10 year plan. Mission, Vision and Strategy 2007 - 2017. Public Draft.

National Park Service. 2000. National Register of Historic Places. Washington, D.C.

National Research Council Committee on the Toxicological Effects of Methylmercury. 2000. Toxicological Effects of Methylmercury. In: N.A. Press (Editor), Washington, DC.

Nelson NC. 1909. *Shellmounds of the San Francisco Bay Region*. University of California Publications American Archaeology and Ethnology Vol. 7 No. 4.

Neuman, K. K., G. W. Page, et al. (2004). "Effect of mammalian predator management on Snowy Plover breeding success." *Waterbirds* 27(3): 257-263.

Newark Unified School District (NUSD). n.d. Newark Unified School District Webpage (http://www.nusd.k12.ca.us/schools.html), accessed by Suet Chau, EDAW, Inc., September 30, 2005.

Northwest Hydraulic Consultants. 2002. Final Reconnaissance Report: Engineering and Environmental Reconnaissance Studies of the River Reach from UPRR to the Bay. Lower Guadalupe River Project.

Offerman JK. 1985. *Archaeological Survey Report, Landscaping Project along Routes 84 and 101 in San Mateo and Alameda Counties, 04-SM/Ala-101, 84, 04253-033231 (Caltrans).* Report on file at the Northwest Information Center, Rohnert Park, California.

Ogden Beeman & Associates, Ray B. Krone & Associates. 1992. Sediment Budget for San Francisco Bay. Report nr Final report prepared for the SF District Corps of Engineers. 25 pp. p.

Orlando JL, Drexler JZ, Dedrick KG. 2005. South San Francisco Bay Tidal Marsh Vegetation and Elevation Surveys - Corkscrew Marsh, Bird Island, and Palo Alto Baylands, California, 1983. Sacramento, CA: US Geological Survey.

Oros D, Hoover D, Rodigari F, Crane D, Sericano J. 2005. Levels and Distribution of Polybrominated Diphenyl Ethers in Water, Surface Sediments, and Bivalves from the San Francisco Estuary. Environmental Science & Technology, 39(1): 33-41.

Page BM, 1989. Coast Range uplifts and structural valleys. in Wahrhaftig, C. and Sloan, D. (eds.) Geology of the San Francisco and Vicinity. 28th International Geological Congress Field Trip Guidebook T105, p. 30- 32.

Page RR, Gilbert CA, Dolan SA. 1998. *A Guide to Cultural Landscape Reports: Contents, Process, and Techniques. Park Historic Structures and Cultural Landscapes Program, Cultural Resource Stewardship and Partnerships*. National Park Service, U.S. Department of the Interior, Washington, D.C.

Page, G. and D. F. Whitcare (1975). "Raptor predation on wintering shorebirds." *The Condor* 77: 73-83.

Page, G. W. (2001). Preliminary findings from shorebird use of South San Francisco Bay study, Unpublished information prepared for 7/26/01 Salton Sea meeting.

Page, G. W. and L. E. Stenzel (1979). The breeding status of the Snowy Plover in California, California Department of Fish and Game, Nongame Wildlife Investigations Report, Project W-54-R-12, Job III-15.

Page, G. W., L. E. Stenzel, et al. (1991). "Distribution and abundance of the Snowy Plover on its western North American breeding grounds." *Journal of Field Ornithology* 62(2): 245-255.

Page, G. W., L. E. Stenzel, et al. (1999). "Overview of shorebird abundance and distribution in wetlands of the Pacific Coast of the contiguous United States." *Condor* 101: 461-471.

Palo Alto Unified School District. n.d. Available http://www.pausd.palo-alto.ca.us/community/about/background.shtml. Accessed by Suet Chau, EDAW, Inc., September 30, 2005.

Payne S. 1987. *Santa Clara County: Harvest of Change*. Windsor Publications, Northridge.

Post, Debby. 2005. Secretary, San Jose Fire Department. Personal communication, September 15, 2005.

Powell M, Cloern J, Walters R. 1986. Phytoplankton spatial distribution in South San Francisco Bay: Mesoscale and small-scale variability. Estuarine Variability: Academic Press. p 369-383.

Powell T, Cloern J, Huzzey L. 1989. Spatial and temporal variability in South San Francisco Bay (USA). 1. Horizontal distributions of salinity, suspended sediments, and phytoplankton biomass and productivity. Estuarine Coastal and Shelf Science 28(6):583-597.

Powers S. 1877. *Tribes of California*. Contributions to North American Ethnology 3. Washington: U.S. Geographical and Geological Survey of the Rocky Mountain Region. Reprinted 1976.

PWA (2006). South Bay Geomorphic Assessment. San Francisco, CA., Prepared for: California State Coastal Conservancy, U.S. Fish and Wildlife Service, California Department of Fish and Game.

PWA, Brown and Caldwell, H. T. Harvey & Associates. in progress. Pond A8 Engineer's Report. Prepared for the Santa Clara Valley Water District, the California State Coastal Conservancy, and the U.S. Fish & Wildlife Service.

PWA, H. T. Harvey & Associates, EDAW, Brown and Caldwell. 2005. Hydrodynamics and Sediment Dynamics Existing Conditions Report. San Francisco, CA.: Prepared for: California State Coastal Conservancy, US Fish and Wildlife Service, California Department of Fish and Game.

PWA, H. T. Harvey & Associates, EDAW, Brown and Caldwell. 2005a. Flood Management and Infrastructure Existing Conditions Report. San Francisco, CA.: Prepared for: California State Coastal Conservancy, US Fish and Wildlife Service, California Department of Fish and Game.

PWA, H. T. Harvey & Associates, EDAW, Brown and Caldwell. 2005b. Hydrodynamics and Sediment Dynamics Existing Conditions Report. San Francisco, CA.: Prepared for: California State Coastal Conservancy, U.S. Fish and Wildlife Service, California Department of Fish and Game.

PWA, H. T. Harvey & Associates, et al. (2004). Initial Opportunities and Constraints Summary Report, South Bay Salt Pond Restoration Project. San Francisco, CA., Prepared for: California State Coastal Conservancy, U.S. Fish and Wildlife Service, California Department of Fish and Game.

PWA, Phyllis Faber & Associates. 2003. Monitoring the Evolution of Restored Tidal Marshes in San Francisco Bay: Physical and Vegetation Monitoring Data For Warm Springs, Muzzi, & China Camp Marshes from 1981 to 2003. Prepared for The Bay Institute. Report nr PWA#1575.

PWA. 1987. Hydrologic Factors in the Palo Alto Yacht Harbor Restoration. Report nr PWA#406.

PWA. 2004. Cooley Landing Salt Pond Restoration Year-3 Monitoring Report. Prepared for Star-Link Logistics, Inc., North Carolina. 24 plus appendices p.

PWA. 2006a. Flood Analyses Report. San Francisco: Prepared for: California State Coastal Conservancy, US Fish and Wildlife Service, California Department of Fish and Game. 60 p.

PWA. 2006b. Hydrodynamic Modeling Report: Alternatives Analysis. San Francisco, CA.: Prepared for: California State Coastal Conservancy, US Fish and Wildlife Service, California Department of Fish and Game.

PWA. 2006c. South Bay Geomorphic Assessment. San Francisco, CA.: Prepared for: California State Coastal Conservancy, US Fish and Wildlife Service, California Department of Fish and Game.

Ramirez, Dora. 2005. Administrative Assistant. Union City Fire Department. Personal communication, September 29, 2005.

Ravenswood City School District (RCSD). 2004. Ravenswood City School District Webpage (http://www.ravenswood.k12.ca.us/General%20Information.htm), accessed by Suet Chau, EDAW, Inc., September 30, 2005.

Ray, M. S. (1919). "More summer birds of San Francisco County." *Condor* 18: 222-27.

Redwood City School District. n.d. Redwood City School District – Schools Webpage (http://rcsd.ca.campusgrid.net/home/Schools), accessed by Suet Chau, EDAW, Inc., September 30, 2005.

Redwood City. 2004. Redwood City Fire Department (http://www.redwoodcity.org/fire/) accessed via internet by Mary Laux, EDAW, Inc., on September 15, 2004.

Redwood City. n.d. *History of Redwood City*. Available <http://classic.redwoodcity.org/about/local_history/exhibits/redwood_city/rwc_history.html> Accessed August 2006.

Rees DM, Nielsen LT. 1947. On the biology and control of Aedes dorsalis (Meigen) in Utah, Proc. N.J. Mosq. Exterm. Assoc.: 34:160-165.

Regional Water Quality Control Board. 2007. Total Maximum Daily Load for PCBs in San Francisco Bay: Proposed Basin Plan Amendment and Staff Report, California Regional Water Quality Control Board, San Francisco Region.

Rintoul, C., N. Warnock, et al. (2003). "Breeding status and habitat use of Black-necked Stilts and American Avocets in South San Francisco Bay." *Western Birds* 34(1): 2-14.

Robinson, J. A., J. M. Reed, et al. (1999). Black-necked Stilt (Himantopus mexicanus). *The Birds of North America*. A. P. a. F. Gill. Washington, DC., Academy of Natural Sciences, Philadelphia, and American Ornithologists' Union, Washington, DC. 449.

Robinson, J. A., L. W. Oring, et al. (1997). American Avocet (Recurvirostra americana). *The Birds of North America*. A. P. a. F. Gill, Academy of Natural Sciences, Philadelphia, and American Ornithologists' Union, Washington, DC. 275.

Rode, Pete. 2004. Captain, Santa Clara County Sheriff's Department. Personal communication, September 16, 2004.

Rodgers, J. A., Jr. and H. T. Smith (1995). "Set-back distances to protect nesting bird colonies form human disturbance in Florida." *Conservation Biology* 9: 89-99.

Romic Environmental Technologies Corp. 1993. *The History of East Palo Alto*. Available < http://www.epa.net/info/epa_history.html> Accessed August 2006.

Rosenthal J. 2001. Archaeological Survey and Extended Phase I/Phase II Excavations at CA-ALA-485 and -486 in the Baumberg Ecological Mitigation Tract, Alameda county, California. Report prepared for Army Corps of Engineers by Far Western Anthropological Research Group, Inc.

Ross RM, Oros DR. 2004. Polycyclic Aromatic Hydrocarbons in the San Francisco Estuary Water Column: Sources, Spatial Distributions, and Temporal Trends (1993-2001). Chemosphere, 57: 909-920.

Rubega, M. A. and J. A. Robinson (1997). Water salinization and shorebirds: emerging issues. *Conservation and management of shorebirds in the western Great Basin of North America. International Wader Studies 9*. N. W. J. M. Reed, and L. W. Oring. 9: 45-54.

Ruhlen, T., D., S. Abbott, et al. (2003). "Evidence that human disturbance reduces snowy plover chick survival." *Journal of Field Ornithology* 74(3): 300-304.

Ruth and Going Inc., Cooper-Clark Associates, Krone RB, Cheney MH. 1980. Causes of Sedimentation at Santa Clara County Marina, Alviso and Remedial Measures. Draft Report. Prepared for the County of Santa Clara.

RWQCB SFR. 2005. Order No. R2-2005-0003 Waste Discharge Requirements for: Cargill Pond A18 Low Salinity Salt Pond. Santa Clara County: Cargill Incorporated.

Salinas, Julio. 2004. Staff Toxicologist, Office of Health Hazard Assessment, Sacramento, CA. Telephone conversation with Kurt Legleiter of EDAW regarding exposure period for determining heath risk. August 3, 2004.

San Francisco Bay Area Wetlands Ecosystem Goals Project. 1999. *Baylands Ecosystem Habitat Goals Report.*

San Francisco Bay Conservation and Development Commission (BCDC). 1993. *The Comprehensive Conservation and Management Plan* (CCMP).

San Francisco Bay Conservation and Development Commission (BCDC). 2002. *The Bay Plan*.

San Francisco Bay Joint Venture. 2001. *Implementation Strategy.*

San Francisco Bay Joint Venture. 2004. West Nile virus strategy and communications plan. Unpublished report.: 13.

San Francisco Bay Regional Water Quality Control Board. 2003. *Basin Plan.*

San Francisco Bay Regional Water Quality Control Board. 2006. Mercury in San Francisco Bay: Proposed Basin Plan Amendment and Staff Report for Revised Total Maximum Daily Load (TMDL) and Proposed Mercury Water Quality Objectives, California Environmental Protection Agency, Oakland, California.

San Francisco Estuary Institute. 2005. The Pulse of the Estuary: Monitoring and Managing Water Quality in the San Francisco Estuary. SFEI Contribution 411., Oakland, CA.

San Francisco Estuary Institute. 2006 [Accessed]. Wetland Tracker Projects. Available at < http://www.wetlandtracker.org/GISInfoCatalog/servlet/org.sfei.GISInfoCatalog.UserInterface?directive=listprojects&listall=yes>.

San Mateo County Transit District. 2005. *SamTrans Bus Route Map.*

Sandoval JS. 1988. *Mt. Eden Cradle of the Salt Industry in California*. Mt. Eden Historical Publishers, Hayward, CA.

Santa Clara County Bird Data (Unpublished). Data compiled by William G. Bousman for the Santa Clara Valley Audubon Society.

Santa Clara County. 1994. *Santa Clara County General Plan.* Available: < http://www.sccgov.org/SCC/docs%2FPlanning%2C%20Office%20of%20%28DEP%29%2Fattachments%2F631321pl_GP_Book_A.pdf>. December 20.

Santa Clara County. 2003. Section B-11. Chapter VIII, Control of Noise and Vibration (Ord. No. NS-517.72, § 2, 4-15-03). Available: <http://www.sccgov.org/SCC/docs/scc_ordinance/TOC056.HTM>.

Santa Clara County. 2004. Santa Clara County Office of the Sheriff (http://www.sccgov.org/site/0,4760,sid%253D12655,00.html) accessed via internet by Mary Laux, EDAW, Inc., on September 15, 2004.

Santa Clara Valley Transportation Authority. 2006. *Bus and Rail Map.* (July).

Santa Clara Valley Urban Runoff Pollution Prevention Program. 2002. Case Studies Involving Elevated Levels of PCBs in Strom Drain Sediments in San Jose, California, EOA, Inc., Oakland, California.

Santa Clara Valley Water District. 1997. Integrated Water Resources Plan Final Report.

Santa Clara Valley Water District. 2001. Lower Guadalupe River Planning Study: Engineers Report.

Santa Clara Valley Water District. 2001. Santa Clara Valley Water District Groundwater Management Plan.

Santa Clara Valley Water District. 2003. Watershed Characteristics Report. Santa Clara Valley Water District (SCVWD).

Santa Clara Valley Water District. 2005a. Groundwater Conditions 2002/2003.

Santa Clara Valley Water District. 2005b. Urban Water Management Plan 2005.

Sayce, K. (1988). Introduced Cordgrass, *Spartina alterniflora* Loisel in Saltmarshes and Tidelands of Willapa Bay, Washington, U.S. Fish and Wildlife Service: 70.

Schaaf & Wheeler. 2004. Alviso Slough Tidal Prism Enhancement Project

Schemel LE. 1995. Measurements of salinity, temperature, and tides in South San Francisco Bay, California, at Dumbarton Bridge: 1990-1993 water years. US Geological Survey. Report nr Open-File Report 98-650.

Schenck WE. 1926. *Historic Aboriginal Groups of the California Delta Region*. University of California Publications in American Archaeology and Ethnology. Volume 23(2) pp. 123–146. University of California Berkeley.

Schmidt DA, Burgmann R. 2003. Time-dependent uplift and subsidence in the Santa Clara Valley, from a large interferometric synthetic aperture radar data set. Journal of Geophysical Research - Solid Earth 108:2416.

Schmidt, KM, Ellen SD, Haugerud RA, and Peterson DM. 1995. Breaks in pavement and pipes as indicators of range-front faulting resulting from the 1989 Loma Prieta earthquake near the southwest margin of the Santa Clara Valley, California: U.S. Geological Survey Open-file Report 95-820, 18 p., 2 plates.

Schoellhamer D. 1996. Factors affecting suspended-solids concentrations in South San Francisco Bay, California. Journal of Geophysical Research - Oceans 101(C5):12087-12095.

Schoellhamer D. 2005. pers. comm. regarding addition of Coyote Creek USGS SSC monitoring station.

Schoellhamer, D., J. Lacy, et al. (2005). Draft Science Synthesis. Issue 2. Sediment management: Creating desired habitat while preserving existing habitat.

Schummer, M. L. and W. R. Eddleman (2000). "Effects of disturbance on activity and energy budgets of migrating waterbirds in south-central Oklahoma." *J. Wildl. Manage.* 67(4): 789-795.

Schwarzbach S, Adelsbach T. 2003. Field assessment of avian mercury exposure in the Bay-Delta ecosystem. Final Report to the California Bay Delta Authority, pp. 30.

Shaver, R., 2007. South Bay Salt Ponds Restoration Project Draft Environmental Impact Statement / Environmental Impact Report (Comment letter on public review draft). In: C. Morris (Editor). Alameda County Water District, Fremont, California.

Shuford, D. W. and D. P. Craig (2002). . Status assessment and conservation recommendations for the Caspian Tern (*Sterna caspia*) in North America. Portland, OR, U.S. Fish and Wildlife Service.

Siegel SW, Bachand PAM. 2002. *Feasibility Analysis, South Bay Salt Pond Restoration.* San Rafael, California: Wetlands and Water Resources. 228 p.

Smart, R. M. and J. W. Barko (1978). "Influence of sediment salinity and nutrients on the physiological ecology of selected salt marsh plants." *Estuarine and Coastal Marine Science* 7: 487-495.

South Bay Salt Pond Restoration Project. 2005. ISP 2005 Self-monitoring Data. Receiving water monitoring, Pond A16 discharge monitoring, Pond A14 discharge monitoring, Pond A7 discharge monitoring, Pond A3W discharge monitoring, Pond A2W discharge monitoring. http://www.southbayrestoration.org/Monitoring.html.

Specialty Solid Waste and Recycling. n.d. Specialty Solid Waste and Recycling – About Us Webpage (http://www.sswr.com/about.html), accessed by Suet Chau, EDAW, Inc., September 30, 2005.

Spendelow, J. A. and S. R. Patton (1988). National atlas of coastal waterbird colonies in the contiguous United States: 1976-1982. *U.S. Fish and Wildlife Service Biological Report 88(5)*. Washington, D.C., U.S. Fish and Wildlife Service.

Stallings L. 2004. Discussions on Pond A8 ISP mercury monitoring. In: M.B.B.a. Caldwell) (Editor), email.

State of California. 1976. California Inventory of Historic Resources. Office of Historic Preservation. On file, Northwest Information Center.

State of California. 1989. Survey of Surveys (historic and architectural resources). Department of Parks and Recreation, Office of Historic Preservation. On file, Northwest Information Center.

State of California. 1992. California Points of Historical Interest. Department of Parks and Recreation, Office of Historic Preservation. On file, Northwest Information Center.

State of California. 1996. California Historical Landmarks. Department of Parks and Recreation, Office of Historic Preservation, Sacramento.

State of California. 2000. Directory of Properties in the Historical Resources Inventory. On file, Northwest Information Center.

State of California. 2001. California Register of Historical Resources. On file, Northwest Information Center.

State of California. 2006. http://www.oes.ca.gov/Operational/OESHome.nsf/1?OpenForm.

Steckler, Craig. 2004. Chief of Police, City of Fremont Police Department. Personal communication, September 15, 2004

Steere, J. T. and N. Schaefer (2001). *Restoring the estuary: implementation strategy of the San Francisco Bay Joint Venture*. Oakland, California, San Francisco Bay Joint Venture.

Stenzel, L. E. and G. W. Page (1988). "Results of the first comprehensive shorebird census of San Francisco and San Pablo bays." *Wader Study Group Bulletin* 54: 43-48.

Stenzel, L. E. and G. W. Page (1989). Results of the 16-18 April 1988 shorebird census of San Francisco and San Pablo Bays. Stinson Beach, CA, PRBO: 18.

Stenzel, L. E., C. M. Hickey, et al. (2002). "Abundance and distribution of shorebirds in the San Francisco Bay area." *Western Birds* 33(2): 69-98.

Stenzel, L. E., J. E. Kjelmyr, et al. (1989). Results of the first comprehensive shorebird census of northern and central California coastal wetlands 8-12 September 1988. Stinson Beach, CA, PRBO.

Stewart, Greg. 2004. Lieutenant, Union City Police Department. Personal communication, September 14, 2004.

Stoffer P. 2002. Rocks and Geology in the San Francisco Bay Region. U.S. Department of the Interior, U.S. Geological Survey, Bulletin 2195.

Stralberg, D., N. Warnock, et al. (2003). Predicting the effects of habitat change on South San Francisco Bay bird communities: An analysis of bird-habitat relationships and evaluation of potential restoration scenarios. Habitat Conservation Model: Phase One. Stinson Beach, CA, PRBO: 112.

Stralberg, D., V. Toniolo, et al. (2004). Potential Impacts of Non-native *Spartina* Spread on Shorebird Populations in South San Francisco Bay: Final Report to Coastal Conservancy Invasive Spartina Project Contract #02-212. Stinson Beach, CA, PRBO Conservation Science: 61.

Strickman D. 2005. Memo summarizing a meeting with the U.S. Army Corps of Engineers concerning mosquito habitats and the South Bay Shoreline Study. San Jose, CA, Santa Clara County Vector Control.

Strong, C. M. (2003). Coyote Creek flood control project Reach 1A waterbird pond monitoring program 1992-2003 final report. Prepared for the Santa Clara Valley Water District.

Strong, C. M. (2004). A summary of nesting waterbirds in the San Francisco Bay, from 1982 to 2004. Unpubl. report, San Francisco Bay Bird Observatory, Alviso, California. Alviso, San Francisco Bay Bird Observatory.

Strong, C. M., N. Wilson, et al. (2004). Western Snowy Plover numbers, nesting success, and avian predator surveys in the San Francisco Bay, 2004. Unpubl. report. Alviso, San Francisco Bay Bird Observatory.

Strong, C. M., Spear L., et al. (2004). Forster's Tern, Caspian Tern, and California Gull colonies in the San Francisco Bay: habitat use, numbers and trends, 1982-2003. Submitted.

Sunnyvale School District. n.d. Sunnyvale School District School Sites Webpage ((http://www.sesd.org/)), accessed by Suet Chau, EDAW, Inc., September 29, 2005.

Swarth, C. W., C. Akagi, et al. (1982). The distribution patterns and ecology of waterbirds using the Coyote Hills salt ponds: 75.

Takekawa, J. Y., A. K. Miles, et al. (2005). South Bay Salt Ponds Restoration Project Short-term Data Needs, 2003-2005. Unpublished Final Draft. Vallejo, CA, U. S. Geological Survey: 267.

Takekawa, J. Y., A. K. Miles, et al. (2006). "Trophic structure and avian communities across a salinity gradient in evaporation ponds of the San Francisco Bay estuary." *Hydrobiologia* 567: 307-327.

Takekawa, J. Y., C. Lu, et al. (2001). "Avian communities in baylands and artificial salt evaporation ponds of the San Francisco Bay estuary." *Hydrobiologia* 466: 317-328.

Takekawa, J. Y., J. M. Alexander, et al. (2000). Waterfowl and shorebirds of the San Francisco Estuary. Goals Project. Baylands Ecosystem Species and Community Profiles: Life Histories and Environmental Requirements of Key Plants, Fish and Wildlife. P. R. Olofson. Oakland, CA, San Francisco Bay Area Wetlands Ecosystem Goals Project. San Francisco Bay Regional Water Quality Control Board: 309-316.

Tano, Erika. 2005. Principal Office Assistant. Sunnyvale Department of Public Safety. Personal communication, October 5, 2005.

Telford AD. 1958. "The pasture Aedes of Central and Northern California. Seasonal History." *Ann. Ent. Soc. Amer.* 51: 360-365.

TerraPoint. 2005. Project Report, USGS - South Bay Restoration Project. 33 p.

Tetra Tech Inc. 2004. Guadalupe River Watershed Mercury TMDL Project, Technical Memorandum 4.3, Draft Final Conceptual Model Report.

The Oakland Athletics Baseball Company. (2007). Preliminary Draft Ballpark Village Community Specific Plan. November 8.

Thomas MA, et al. 2002. Mercury contamination from historic mining in water and sediment, Guadalupe River and San Francisco Bay, California. Geochemistry: Exploration, Environment, Analysis, 2(3): 211-217.

Toppozada TR, and Borchardt G. 1998. Re-evaluation of the 1836 "Hayward Fault" earthquake and the 1838 San Andreas fault earthquake: Bulletin Seismological Society of America. v. 88. p. 140-159.

Toppozada TR, and Parke DL. 1982. Areas damaged by California earthquakes. 1900-1949: Annual Technical Report - Fiscal Year 1981-1982. California Division of Mines and Geology. Open File Report 82-17 SAC. 65p.

Toppozada TR, Real CR. and Parke DL. 1981. Preparation of isoseismal maps and summaries of reported effects for pre-1900 California earthquakes: Annual Technical Report - Fiscal Year 1980-1981, California Division of Mines and Geology. Open File Report 81-11 SAC. 182 p.

Tora, Ursula. 2004. Menlo Park Fire Protection District, Administrative specialist. Personal communication, September 13, 2004.

Townley SD, and Allen MW. 1939. Descriptive catalog of earthquakes of the Pacific coast of the United States. Bulletin of the Seismological Society of America. 29. p. 1–297.

Trost, R. E. and M. S. Drut (2005). Pacific Flyway data book; waterfowl harvests and status, hunter participation and success, and certain hunting regulations in the Pacific Flyway and United States. Portland, Oregon, U.S. Fish and Wildlife Service.

Trulio, L. A., J. C. Callaway, et al. (2004). South Bay Salt Pond Restoration Project Science Strategy: A Framework for Guiding Scientific Input into the Restoration Process.

Tsai P, Hoenicke R, Yee D, Baker J, Bamford H. 2005. San Francisco Bay Atmospheric Deposition Pilot Study Part 3: Dry Deposition of PAHs and PCBs. SFEI Contribution #408., San Francisco Estuary Institute and Chesapeake Biological Laboratory, University of Maryland Center for Environmental Science.

Tucci, L., C. Strong, et al. (2006). Western Snowy Plover population, nesting success, and predator surveys in the San Francisco Bay; 2005 breeding season. Alviso, California, San Francisco Bay Bird Observatory.

Tudor Engineering Company. 1973. Baylands Salt Water Flood Control Planning Study. Tudor Engineering Company.

Tvedt S. 1975. *New Chicago: Land Promotion in Alviso, 1890-1891*. Paper on file, California Room, San Jose Public Library, San Jose, California.

Union Sanitary District (USD). 2004. Our Mission, Facts, and History (http://www.unionsanitary.com/mission.htm), accessed by Suet Chau, EDAW, Inc., September 28, 2005.

United States Army Corps of Engineers. 1984. San Francisco Bay: Tidal Stage vs. Frequency Study. San Francisco District.

United States Army Corps of Engineers. 1988. San Francisco Bay Shoreline Study: Southern Alameda and Santa Clara Counties, interim. US Army Corps of Engineers.

United States Army Corps of Engineers. 1989. Office Report San Mateo and Northern Alameda Counties Interim San Francisco Bay Shoreline Study. USACE (US Army Corps of Engineers), San Francisco District. 179 p.

United States Army Corps of Engineers. 1992. Letter Report: San Francisco Bay Shoreline Study. US Army Corps of Engineers.

United States Army Corps of Engineers. 2004. South San Francisco Bay Shoreline Study Project. Section 905(b) (WRDA 86) Analysis.

United States Census Bureau. 2005. Available online at: http://factfinder.census.gov/home/saff/main.html?_lang=en Accessed by Josh Hohn, EDAW, Inc.

United States Census Bureau. 2006 (June 8 – last revised). State and County Quick Facts for Alameda County. Available http://quickfacts.census.gov/qfd/states/06/06001.html.

United States Census Bureau. 2006 (June 8 – last revised). State and County Quick Facts for San Mateo County. Available http://quickfacts.census.gov/qfd/states/06/06081.html.

United States Census Bureau. 2006 (June 8 – last revised). State and County Quick Facts for Santa Clara County. Available http://quickfacts.census.gov/qfd/states/06/06085.html.

United States Environmental Protection Agency (USEPA). 2006 (updated). *National Ambient Air Quality Standards.* Available at http://www.epa.gov/air/criteria.html. Accessed July 2006.

United States Environmental Protection Agency. 1998. *Long Term Management Strategy for Dredge Material*.

United States Environmental Protection Agency. 1999. *Record of Decision – Long-Term Management Strategy for the Placement of Dredged Material in the San Francisco Bay Region.* July 1999. Available at < http://www.spn.usace.army.mil/ltms/rod799.pdf>

United States Environmental Protection Agency. 2004. Draft Aquatic Life Water Quality Criteria for Selenium - 2004. EPA-822-D-04-001, Washington, D.C.

United States Fish and Wildlife Service (2001). Letter from the US Fish and Wildlife Service dated March 20, 2001. Bay Conservation and Development Commission.

United States Fish and Wildlife Service and California Department of Fish and Game. 2003. South Bay Salt Ponds Initial Stewardship Plan.

United States Fish and Wildlife Service. 2002. Don Edwards San Francisco Bay National Wildlife Refuge - Hunting and Fishing.

United States Fish and Wildlife Service. 2004. Centralized Library - Statewide Policies. Available at http://http://policy.fws.gov

United States Fish and Wildlife Service. 2005 (September). Banking on Nature 2004: The Economic Benefits to Local Communities of National Wildlife Refuge Visitation.

United States Fish and Wildlife Service. 2005. 2004 Annual Self-Monitoring Report for Alviso Ponds within South San Francisco Bay Low Salinity Salt Ponds. Alameda, Santa Clara, and San Mateo Counties. Order No. R2-2004-0018, WDID No. 2 019438007.

United States Fish and Wildlife Service. 2006. A16 Operation Plan 2006.

United States Geological Survey, Unpublished Data. 2005. Preliminary data collected under contract to the California Coastal Conservancy for use by the South Bay Salt Ponds Restoration Project.

United States Geological Survey. 2004a. Continuous Monitoring in the San Francisco Bay and Delta http://sfbay.wr.usgs.gov/access/Fixed_sta/. United States Geological Survey (USGS).

United States Geological Survey. 2004b. Surface Water Data for the USA: Monthly Streamflow Statistics

United States Geological Survey. 2004c. Water Quality of the San Francisco Bay http://sfbay.wr.usgs.gov/access/wqdata/. United States Geological Survey (USGS).

United States Geological Survey. 2004e. Surface Water Data for the USA: Monthly Streamflow Statistics

United States Geological Survey. 2005 (February) Tsunami Record from the Great 1906 San Francisco Earthquake. Available < http://walrus.wr.usgs.gov/tsunami/1906.html>. Accessed July 20, 2005.

United States Geological Survey. 2005. South Bay Salt Ponds Restoration Project Short-term Data Needs, 2003-2005. Vallejo, California.

United States Geological Survey. USGS Water Data for the Nation. (http://nwis.waterdata.usgs.gov).

United States Navy. n.d. Naval Air Station, Moffett Field Silver Anniversary 1933 – 1958.

Updike RG. Egan JA, Moriwaki Y, Idriss IM, and Moses TL. 1988. A model for earthquake-induced translatory landslides in Quaternary sediments: Geological Society of America Bulletin, v.100. May. pp.783-792.

URS. 2002. Proposed SFO Runway Reconfiguration Project, Predicted changes in hydrodynamics, sediment transport, water quality, and aquatic biotic communities associated with SFO runway reconfiguration. Alternative BX-6. Prepared for the City and County of San Francisco and the Federal Aviation Administration.

URS. 2003. Proposed SFO Runway Reconfiguration Project, Final Technical Report: Predicted changes in hydrodynamics, sediment transport, water quality, and aquatic biotic communities associated with SFO runway reconfiguration. Alternative BX-6, A3 and BX-R. Prepared for the City and County of San Francisco and the Federal Aviation Administration.

Veneklasen, Paul S., & Associates. 1973. Noise Insulation Problems in Buildings. As Cited in State of California Department of Transportation, Division of Aeronautics. 2002 (January). California Airport Land Use Handbook. Available at < www.dot.ca.gov/hq/planning/aeronaut/htmlfile/landuse.html > Accessed: July 2005.

Ver Planck WE. 1958. *Salt in California*. Division of Mines, Bulletin 175. San Francisco: Department of Natural Resources.

Vogel, Jim. Recreation Planner. 2005 (July 18). (EDAW) per comm.. regarding peak recreational use periods.

Wallace WJ. 1978. Northern Valley Yokuts. In *Handbook of North American Indians, Vol. 8*. Smithsonian Institution, Washington, D.C.

Walters RA, Cheng RT, Conomos TJ. 1985. Time scales of circulation and mixing processes of San Francisco Bay waters. Hydrobiologia 129: p13-36.

Warnock, N. (2004). Managing salt ponds to protect migratory bird diversity and abundance. Unpublished science synthesis for the Science Team of the South Bay Salt Pond Restoration Project.

Warnock, N., G. W. Page, et al. (1995). "Non-migratory movements of Dunlins on their California wintering grounds." *Wilson Bulletin* 107: 131-139.

Warnock, N., G. W. Page, et al. (1997). "Local survival of Dunlin wintering in California." *Condor* 99: 906-915.

Warnock, N., G. W. Page, et al. (2002). "Management and conservation of San Francisco Bay salt ponds: effects of pond salinity, area, tide, and season on Pacific Flyway waterbirds." *Waterbirds* 25: 79-92.

Warnock, S. E. and J. Y. Takekawa (1995). "Habitat preferences of wintering shorebirds in a temporally changing environment: Western Sandpipers in the San Francisco Bay estuary." *Auk* 112(4): 920-930.

Warwick, R. M. and R. Price (1975). "Macrofauna production in an estuarine mud flat." *Journal of the Marine Biological Association of the United Kingdom* 55(1): 1-18.

Washino RK, Jensen T. 1990. "Biology, ecology, and systematics of Aedes dorsalis, Ae. melanimon, and Ae. campestris in western North America. Univ. Calif." *Ann. Rep. Mosq. Cont. Res* (40-41).

Water Resources & Information Management Engineering Inc. 2005. Niles Cone and South East Bay Plain Integrated Groundwater and Surface water Model (NEBIGSM) - Model Development and Calibration.

Watson EB. 2004. Changing elevation, accretion, and tidal marsh plant assemblages in South San Francisco Bay tidal marsh. Estuaries 27(4):684-698.

Watt L. 2005. *South Bay Salt Pond Restoration Project Historic Context Report.* Prepared for California State Coastal Conservancy, U.S. Fish & Wildlife Service, and the California Department of Fish & Game. Report on file, EDAW, Inc., San Francisco, California.

Weaver, Verna. 2006. Traffic Checker. City of San Jose Department of Transportation. Personal Communication with Suet Chau, EDAW. 14 September 2006.

Wells, L. E. and M. Gorman (1994). Late Holocene environmental variability in the upper San Francisco Estuary as reconstructed from tidal marsh sediments. *Proceedings of the Eleventh Annual Pacific Climate (PACLIM) Workshop Technical Report 40*. Interagency Ecological Program. Sacramento, CA.

Wentworth CM. 1997. General distribution of geologic materials in the San Francisco Bay region, California: a digital database, http://geopubs.wr.usgs.gov/open-file/of97-744/.

Wetlands Research Associates. 2000. Annual Monitoring Report Preliminary Results Following Introduction of Full Tidal Conditions Year 5. San Rafael, CA: Prepared for: Cargill Salt Company for submission to: US Army Corps of Engineers COE Permit # 19009E98. 24 p.

White, B. C. (1995). The shorebird foraging response to the eradication of the introduced cordgrass, *Spartina alterniflora*. San Francisco, CA, San Francisco State University: 60.

Wiener JG, Krabbenhoft DP, Heinz GH, Scheuhammer AM. 2003. Chapter 16, Ecotoxicology of Mercury. In: D.J. Hoffman, B.A. Rattner, G.A. Burton, Jr. and J. Cairns, Jr. (Editors), Handbook of Ecotoxicology. CRC Press, Boca Raton, Florida, pp. 409-463.

Willard RH. 1988. Alameda County, California Crossroads. Windsor Publications, Inc.

Willey GR, Phillips P. 1958. *Method and Theory in American Archaeology*. Chicago: University of Chicago Press.

William R. DeJager, US Army Corps of Engineers, Email communication on November 17, 2006.

Williams PB, Orr MK, Garrity NJ. 2002. Hydraulic geometry: A geomorphic design tool for tidal marsh channel evolution in wetland restoration projects. Restoration Ecology 10(3):577-590.

Witter Robert C. and others, 2006. Maps of Quaternary Deposits and Liquefaction Susceptibility in the Central San Francisco Bay Region. California In cooperation with the California Geological Survey. Geology by Robert C. Witter, Keith L. Knudsen, Janet M. Sowers, Carl M. Wentworth, Richard D. Koehler, and Carolyn E. Randolph; Digital database by Carl M. Wentworth, Suzanna K. Brooks, and Kathleen D. Gans, Geological Survey Open-File Report 2006-1037. Version 1.1.

Woodall, Angela. 2006 (June 24). Newark approves golf course plan. Published in the Oakland-Tribune.

Woodward-Lundgren & Associates. 1971. Soil and Geologic Data Collection. Bay Lands Flood Control Planning Study.

Wright SA, Schoellhamer DH. 2004. Trends in the Sediment Yield of the Sacramento River, California, 1957 - 2001. San Francisco Estuary and Watershed Science 2(2).

Yasue, M., J. L. Quinn, et al. (2003). “Multiple effects of weather on the starvation and predation risk trade-off choice of feeding location in Redshanks.” *Functional Ecology* 17: 727-736.

Youd TL, and Hoose SN. 1978. Historic ground failures in Northern California triggered by earthquakes: USGS Professional Paper 993.

Youd TL, and Perkins DM. 1978. Mapping of Liquefaction induced ground failure potential: Journal of the Geotechnical Engineering Division. American Society of Civil Engineers. v.104, n.4, pp. 433-446.

Zhu, Yifang, W. C. Hinds, S. Kim, and S. Shen. 2002. Study of Ultrafine Particles Near a Major Highway with Heavy-duty Diesel Traffic. Atmospheric Environment 36:4323-4335.

8. REPORT PREPARERS

8.1 Federal Lead Agency

United States Fish and Wildlife Service (USFWS)
Don Edwards San Francisco Bay National Wildlife Refuge
9500 Thornton Avenue
Newark, CA 94560
Contacts: Mendel Stewart, Clyde Morris

8.2 State Lead Agency

California Department of Fish and Game (CDFG)
PO Box 47
Yountville, CA 94599
Contacts: Carl Wilcox, John Krause

8.3 Partner Agencies

California Coastal Conservancy (Conservancy)
1330 Broadway, 13th Floor
Oakland, CA 94612

United States Army Corps of Engineers (Corps)
1455 Market Street
San Francisco, CA 94103

Santa Clara Valley Water District (SCVWD)
5750 Almaden Expressway
San Jose, CA 95118

Alameda County Flood Control and Water Conservation District (ACFCWCD)
399 Elmhurst Street
Hayward, CA 94544

8.4 Principal Preparers

Responsibility for preparation of this EIS/R rests with the lead agencies for the SBSP Restoration Project: USFWS, the joint lead federal agency under NEPA; and CDFG, the state lead agency under CEQA.

Listed below are the employees of the consulting firms involved in preparation of this EIS/R, including their qualifications (educational degree, area of expertise, and years of experience in their profession).

8.4.1 EDAW

David Blau, Principal-in-Charge, Master of City Planning. Over 30 years experience. Professional and technical review.

Marie Galvin, B.S., Environmental Policy Analysis and Planning. 14 years experience. Project Manager for the EIS/R. Prepared and reviewed various EIS/R sections, including the executive summary, introduction, description of alternatives and cumulative impacts sections.

Donna Plunkett, B.L.A., Landscape Architecture. 23 years experience. Recreation and Public Access Task Leader. Prepared recreation resources section and project description for recreation and public access.

Suet Chau, B.A., Environmental Science. 10 years experience. Assistant Project Manager for the EIS/R. Prepared various sections of the EIS/R, including the traffic, air quality and noise sections.

Mark Winsor, PhD., Physical Geography/Geomorphology. 28 years experience. Technical review.

Curtis Alling, M.A., Natural Resources Planning and Development. 26 years experience. Provided CEQA and NEPA advice.

Gary Jakobs, B.A., Economics and Environmental Studies. 20 years experience. Provided CEQA and NEPA advice.

Charlane Gross, M.A., Social Science. 20 years experience. Prepared the cultural resources section.

Jennifer Hirsch, Master of City Planning. 7 years experience. Prepared the cultural resources section.

Honey Walters, M.S., Atmospheric Sciences. 8 years experience. Prepared the noise and air quality sections.

Don Lee, Master of City Planning. 19 years experience. Prepared and updated the graphics for the EIS/R.

Lynn Frederico, B.A., Environmental Geography. 8 years experience. Prepared and updated the GIS graphics for the EIS/R.

Yates McCallum, B.A. Geography/Sociology Emphasis on Geographic Information Systems and Criminology. 4 years experience. Prepared and updated the graphics for the EIS/R.

Susan Baumgartner, Master of Landscape Architecture. 10 years experience. Prepared and updated the graphics for the EIS/R.

Joshua Hohn, M.C.P., City and Regional Planning. 2 years experience. Prepared the socioeconomics and environmental justice setting sections.

Mary Laux, Bachelor of Arts, Geography. 6 years experience. Prepared the land use setting section.

Aki Omi, M.L.A. with Distinction (Landscape Architecture). 9 years experience. Prepared the recreation and public access character sketches.

Judith Vaughn, Undergraduate Studies in Liberal Arts with a focus in Psychology. 30 years experience. Prepared the list of preparers.

Brian Vahey, word processor for the EIS/R.

8.4.2 PWA

Michelle Orr, P.E., M.S., Water Resources Engineering. 11 years experience. Consultant Team Project Manager. Prepared and reviewed the introduction section, description of alternatives section, hydrology and flooding section and utilities section.

Phil Williams, P.E., Ph.D., Eur. Ing. 36 years experience. Consultant Team Project Director. Reviewed description of alternatives section.

Kris May, Ph.D., Civil and Environmental Engineering. 10 years experience. Hydrodynamic Modeling Task Manager. Prepared and reviewed the introduction section, description of alternatives section, hydrology and flooding section and utilities section.

Don Danmeier, Ph.D., Ocean Engineering. 8 years experience. Alviso Pond A8 Restoration Project Manager. Prepared and reviewed hydrology and flooding section and utilities section.

Nick Garrity, M.S., Civil and Environmental Engineering. 6 years experience. Phase 1 Restoration Actions Project Manager. Prepared and reviewed the description of alternatives section, hydrology and flooding section and utilities section.

Vince Geronimo, P.E., M.S., Civil Engineering (water resources emphasis). 10 years experience. Flood Management Task Manager. Prepared and reviewed hydrology and flooding section and utilities section.

Jeff Haltiner, P.E., Ph.D., Civil Engineering. 33 years experience. Flood Management Task Director. Reviewed hydrology and flooding section.

David Brew, Ph.D., Environmental Sciences. 16 years experience. Geomorphology Task Manager. Prepared hydrology and flooding section.

Bob Battalio, P.E., M.S., Civil Engineering. 22 years experience. Reviewed hydrology and flooding section.

Christie Beeman, P.E., M.S., Civil and Environmental Engineering. 18 years experience. Eden Landing Ponds E8A, E9, and E8X Restoration Project Manager. Reviewed hydrology and flooding section and utilities section.

Jeremy Lowe, B.S. Geography. 22 years experience. Reviewed hydrology and flooding section.

Gaurav Misra, M.S., Earth Systems. 2 years experience. Prepared hydrology and flooding section.

Annika Fain, M.S., Oceanography; and Environmental Science and Engineering. 2 years experience. Prepared hydrology and flooding section and utilities section.

Julie Stephenson, M.S., Physical Geography. 2 years experience. Prepared hydrology and flooding section and utilities section.

Matt Brennan, Ph.D., Civil and Environmental Engineering. 2 years experience. Prepared hydrology and flooding section and utilities section.

Matt Wickland, M.S., Civil and Environmental Engineering. 2 years experience. Prepared hydrology and flooding section and utilities section.

Brad Evans, B.F.A., Graphic Design. 30 years experience. Prepared graphics.

8.4.3 H.T. Harvey

Ron Duke, M.A., Wildlife Ecology. 26 years experience. Reviewed the biological resources section.

Steve Rottenborn, Ph.D., Wildlife Ecology, Ornithology. 17 years experience. Prepared the biological resources section.

John Bourgeois, M.S., Wetland Ecology. 12 years experience. Prepared the biological resources section.

Laird Henkel, M.S., Wildlife Ecology, Marine Ornithology. 10 years experience. Prepared the biological resources section.

Donna Ball, M.S., Wetland Ecology. 2 years experience. Prepared the biological resources section.

8.4.4 Brown and Caldwell

Cindy Paulson, P.E. National Water Resources Practice Leader, Senior Vice President. Ph.D., M.S. Environmental Engineering, B.A.., Political / Environmental Science 20 years experience. Reviewed Nutrients and Contaminants Analysis Report, Mercury Technical Memorandum, Water and Sediment Quality Chapter of EIS/R.

Melih Ozbilgin, Vice President, Western Water Resources Practice Leader. Ph.D. , M.S., Civil and Environmental Engineering, M.S., Community Planning 22 years experience. Reviewed Groundwater Analysis Report, Water and Sediment Quality Chapter of EIS/R.

Martin Steinpress, P.G., CHG. National Groundwater Resources Practice Leader, Chief Hydrogeologist, M.S., Geology. 28 years experience. Prepared Groundwater Analysis Report and Groundwater Sections of EIS/R, reviewed Groundwater Cumulative Impacts section.

Khalil E.P. Abusaba, Principal Scientist. Ph.D. , Chemistry, M.S., Marine Sciences. 20 years experience. Prepared Mercury Technical Memorandum, Nutrients and Contaminants Analysis Report, EIS/R, Water and Sediment Quality Section of Cumulative Impacts Chapter.

Laura Marshall, P.E., Staff Engineer. M.S., Environmental Engineering. 5 years experience. Prepared sections of Groundwater Analysis Report, EIS/R.

Aren Hansen, Engineer. M.S., Environmental Engineering, M.S., Chemistry. 5 years experience. Prepared sections of the EIS.R

Emily Moshier, Engineer. M.S., Environmental Engineering. 4 years experience. Prepared sections of the EIS/R, Nutrients and Contaminants Analysis Report.

Jenny Gain, Engineer. M.S., Environmental Engineering. 4 years experience. Prepared sections of the EIS/R.

8.4.5 Geomatrix

Chris Coutu, M.S., Geotechnical Engineering. 14 years experience. Senior Engineer. Prepared the geology, soils, and seismicity section.

Tim Mote, Ph.D., Geology. 13 years experience. Project Manager/ Senior Geologist. Prepared the geology, soils, and seismicity section.

Faiz I. Makdisi, Ph.D., Geotechnical Engineering. Principal-in-Charge. 30 years experience.

9. DISTRIBUTION LIST

U.S. Elected Officials

Congresswoman Eshoo
Congressman Farr
Congressman Honda
Congresswoman Lee
Congresswoman Lofgren
Congressman McNerney
Congressman Miller
Congresswoman Pelosi
Congressman Stark
Congresswoman Tauscher
Congressman Thompson
Congresswoman Woolsey
Senator Boxer
Senator Feinstein

Federal Agencies

Army Corps of Engineers, Headquarters
Army Corps of Engineers, Sacramento District
Army Corps of Engineers, San Francisco District
Army Corps of Engineers, South Pacific Division
Department of Agriculture, Natural Resources Conservation Service
Department of Energy, Joint Genome Institute
Department of the Interior, Office of Environmental Policy and Compliance
Environmental Protection Agency, Office of Clean Water Act Compliance,
Environmental Protection Agency, Region 9
Federal Aviation Administration
Federal Highway Administration
U.S. Fish and Wildlife Service
Lawrence Livermore National Laboratory
NASA - Jet Propulsion Laboratory
NASA Ames Research Center
National Oceanic & Atmospheric Administration, National Geodetic Survey
National Oceanic & Atmospheric Administration, National Marine Fisheries Service
National Oceanic & Atmospheric Administration, National Marine Fisheries Service, Habitat Conservation Branch
National Oceanic & Atmospheric Administration, Restoration Center
National Parks Commission / Point Reyes National Seashore
Sea Grant
U.S. Geological Survey, Center for Coastal & Watershed Studies
U.S. Geological Survey, Pacific Science Center
U.S. Geological Survey, Menlo Park
U.S. Geological Survey, Western Ecological Research Center
U.S. Geological Survey, Western Fisheries Research Center

California State Elected Officials

Governor Schwarzenegger
Assemblymember Hayashi
Assemblymember Lieber
Assemblymember Ruskin
Assemblymember Torrico
Senator Alquist
Senator Corbett
Senator Perata
Senator Simitian
Senator Yee

State Agencies

Air National Guard
Bay Area Air Quality Management District
California Bay-Delta Authority
California Environmental Protection Agency
Capitol Corridor Joint Powers Authority
Central Valley Regional Water Quality Control Board
Coastal Commission
Coastal Conservancy
Department of Conservation-Division of Land Resource Protection
Department of Fish & Game
Department of Health Services
Department of Pesticide Regulation

Department of Toxic Substances Control
Department of Transportation
Department of Water Resources
Department of Water Resources
Department of Water Resources, Bay Delta Office
Governor's Office, Office of Planning and Research (State Clearinghouse)
Resources Agency
San Francisco Bay Conservation and Development Commission
San Francisco Bay Regional Water Quality Control Board
State Lands Commission
State Parks
State Water Resources Control Board
Wildlife Conservation Board

Local Agencies

Alameda County Board of Supervisors
Alameda County Clean Water Program
Alameda County Flood Control District
Alameda County Mosquito Abatement District
Alameda County Public Works Agency
Alameda County Vector Control Services District
Alameda County Water District
Association of Bay Area Governments
Bay Area Open Space Council
Castro Valley Sanitary District
City of Alameda
City of Alameda Health Care District
City of Berkeley Shorebird Nature Center
City of Campbell
City of Concord
City of Cupertino
City of East Palo Alto
City of Foster City
City of Fremont
City of Hayward
City of Los Altos
City of Menlo Park
City of Milpitas
City of Monte Sereno
City of Morgan Hill
City of Mountain View
City of Newark
City of Oakland
City of Palo Alto
City of Petaluma
City of Redwood City
City of San Francisco
City of San Jose
City of San Jose, Redevelopment Agency
City of San Mateo
City of Santa Clara
City of Saratoga
City of Sunnyvale
City of Sunnyvale, Water Pollution Control Plant
City of Union City
Contra Costa Flood Control District -Public Works Dept.
Contra Costa Vector and Mosquito Control District
Contra Costa Water District
County of San Mateo
Dublin-San Ramon Services District
East Bay Municipal Utility District
East Bay Regional Park District
Guadalupe Coyote Resource Conservation District
Hayward Area Recreation and Park District
Hayward Area Shoreline Planning Agency
Hayward Shoreline Interpretive Center
Livermore Area Recreation and Park District
Marin County Public Works Department
Marin-Sonoma County Mosquito and Vector Control District
Metropolitan Transportation Commission
Midpeninsula Regional Open Space District
Mountain View Sanitary District of Contra Costa County
Napa County Flood Control District
Napa County Mosquito Abatement District
Napa County Resource Conservation District
North Salinas Valley Mosquito Abatement District
Port of Oakland
Port of Redwood City
Port of San Francisco
San Francisco International Airport
San Francisco Public Utilities Commission
San Francisquito Creek Joint Powers Authority
San Mateo County Board of Supervisors
San Mateo County Mosquito Abatement District
San Mateo County Transit District
San Mateo Resource Conservation District
Santa Clara Basin Watershed Management Initiative
Santa Clara County Board of Supervisors
Santa Clara County Farm Bureau
Santa Clara County Open Space Authority
Santa Clara County Vector Control District
Santa Clara Valley Transportation Authority
Santa Clara Valley Urban Runoff Pollution Prevention Program
Santa Clara Valley Water District
Santa Cruz County Mosquito Abatement District
Solano County Mosquito Abatement District
Sonoma County Water Agency
Southern Sonoma Resource Conservation District
Suisun Resource Conservation District

Town of Los Altos Hills
Town of Los Gatos
Union Sanitary District
West Valley Clean Water Program
West Valley Sanitation District

Non-Governmental Organizations

Acterra
AFSCME Local 101
Alameda Creek Alliance
Alviso Water Task Force
American Rivers
Aquarium of the Pacific
Arastradero Preserve Stewardship Program
Assoc. General Contractors of California
Audubon Canyon Ranch
Audubon Society, Ohlone Chapter
Audubon Society, Santa Clara Valley Chapter
Audubon Society, Sequoia Chapter
Bay Area Ridge Trail
Bay Area Sea Kayakers
Bay Institute
Bay Model Association
Bay Planning Coalition
Biodiversity Resources Center
Bio-Integral Resource Center
Boy Scouts
Butte Creek Ecological Preserve
Cal Info
California Marine Affairs Navigation Conference
California Native Plant Society, East Bay Chapter
California Native Plant Society, Marin Chapter
California Native Plant Society, Santa Clara Chapter
California Recreational Boaters of California
California Research Bureau
California Trout Inc.
California Waterfowl Association
California Wildlife Foundation
Campbell Chamber of Commerce
Carnegie Institute
Center for Biological Diversity
Center for Ecosystem Management and Restoration
Center for Public Oversight
Central Valley Habitat Joint Venture
Children's Discovery Museum
Citizen's Committee to Complete the Refuge
CLEAN South Bay
Clean Water Fund
Coastal Land Trust
Committee for Green Foothills
Conservation International
Contra Costa Watershed Forum
Coyote Creek Alliance
Crissy Field Wetlands Project
Cupertino Chamber of Commerce
Defenders of Wildlife
Delta Science Center
Ducks Unlimited
Earthwatch Institute
East Bay Bicycle Coalition
East Bay Conservation Corps
Eden Shores Community
Eden Township Health Care District
Emma Prusch Farm Park
Fishing in the City
Fresno Audubon Society
Friend of Alameda NWR
Friends Guadalupe River Parks & Garden
Friends of Bayfront Park
Friends of Calabazas Creek
Friends of Corte Madera Creek Watershed
Friends of Five Creeks
Friends of Novato Creek
Friends of Sausal Creek
Friends of Stevens Creek Trail
Friends of the Creeks
Friends of the River
Genentech
Golden Gate Audubon Society
Golden West Women Fly Fishers
Gordon & Betty Moore Foundation
Green Team of San Jose
Green Waste Recovery, Inc.
Greenbelt Alliance South Bay Representative
HASPA Citizens Advisory Committee
Hispanic Chamber of Commerce
Home Builders Association, South Bay
Japantown Business Association
Jasper Ridge Biological Preserve
Keep California Beautiful
Lake Merritt Breakfast Club
Leafybranch.org
League of Women Voters
Loma Prieta Chapter of the Sierra Club
Los Altos Chamber of Commerce
Los Gatos Creek Streamside Park Committee
Marin Audubon
Marine Mammal Center
Marine Science Institute
MLK Freedom Center
Morgan Hill Chamber of Commerce
Napa-Solano Audubon Society
National Audubon Society
National Fish and Wildlife Foundation
National Resources Defense Council

Native Americana Heritage Commission
Natural Heritage Institute
Northbay Riparian Station
Nova Private Industry Council
Oakland Museum of California
Our City Forest
Pacific Basin Consortium on Hazardous Waste
Pacific Bell
Pacific Coast Joint Venture
Pacific Industrial & Business Association
Pacific Inter-Club Yacht Association
Palo Alto Baylands Nature Center
Peninsula Open Space Trust
People for Livable and Affordable Neighborhoods
Petaluma Riverkeeper
PRBO Environmental Science
Presidio Trust
RAFT: Resource Area for Teachers
RanaResources
Resources Law Group
Resources Legacy Fund
Responsible Organized Mountain Peddlers (ROMP)
Riparian Habitat Joint Venture
River of Words
Romberg Tiburon Center
S.F. Bay Waterfowl, Association
Salmon & Steelhead Restoration Group
Salmon & Trout Enhancement Program
San Francisco Bay Bird Observatory
San Francisco Bay Joint Venture
San Francisco Boardsailing Association
San Francisco Conservation Corps
San Francisco Estuary Project
San Francisco Invasive Spartina Project
San Francisquito Watershed Council
San Jose Conservation Corps & Charter School
San Mateo County Bridge Trails Committee
San Mateo County Trails Committee
Santa Clara Chamber of Commerce
Santa Clara County Black Chamber of Commerce
Santa Clara County Creeks Coalition
Santa Clara County Streams for Tomorrow
Santa Clara Valley Audubon Society
Save Our South Bay Wetlands
Save the Bay
Save the Wetlands in Mayhews
Semiconductor Industry Association
Sierra Club
Sierra Club, Loma Prieta Chapter
Sierra Club, SF Bay Chapter
Silicon Valley Association of Realtors
Silicon Valley Bicycle Coalition
Silicon Valley Engineering Council
Silicon Valley Land Conservancy
Silicon Valley Leadership Group
Silicon Valley Pollution Prevention Center
Silicon Valley Toxics Coalition
Solano Land Trust
Sonoma Ecology Center
Sonoma Land Trust
South Bay Salmon & Steelhead
South Bay Yacht Club
South Bayland Trails Project
Southbrook Homeowners Association
Southern California Coastal Water Research Project
Star of the Sea PACT
Stevens & Permanente Creeks Watershed Council
Sulphur Creek Nature Center
Sunnyvale Chamber of Commerce
Tahoe Research Group
The Conservation Fund
The Nature Conservancy
The Trail Center
The Watershed Project
Trails for Richmond Action Committee
Tri-City Ecology Center Inc.
Trout Unlimited
Trust for Public Land
United Anglers of California
Urban Creeks Council
Vietnamese Chamber of Commerce
VIMS
Walk San Jose
Washington Township Health Care District
West Point Marina
Wildlife Education & Rehabilitation Center (WERC)
Wildlife Stewards
Willow Glen Homeowners Association

Universities

Bodega Bay Marine Lab
Boston University, Marine Biological Program
Brown University
California State University, East Bay
Humboldt State University
California State University, San Francisco
San Jose State University
California State University, Stanislaus
Center for Collaborative Policy
Chico State University
College of the Redwoods Honors Program
De Anza College
Foothill College
La Universidad del Zulia
Loyola Marymount University
McNeese State University

Mills College
Oregon State University
Santa Clara University
Southern Illinois University in Carbondale
Stanford University
University of California, Berkeley
University of California, Bodega Marine Lab
University of California, Cooperative Extension - Santa Clara County
University of California, Davis
University of California, Los Angeles
University of California, Santa Barbara
University of California, Santa Cruz
University of Nevada
University of New Orleans
University of Rhode Island
University of San Francisco
University of Virginia
University of Washington
University of Washington, School of Aquatic and Fishery Sciences
University of Western Australia

Libraries

Alviso Branch Library*
Biblioteca Latino America
California State Library
Fremont Main Library*
Hayward Public Library*
Menlo Park Library*
Mountain View Library*
Palo Alto Main Library*
San Jose Public Library
Santa Clara County Main Library
Santa Clara Public Library
Sunnyvale Public Library*

Media

ANG Newspapers
Asian Week
Bay Nature Magazine
BayCrossings
Contra Costa Times
ESTUARY
KGO-TV
KQED-FM 88.5
KRON-CHANNEL 4
KTEH
Los Angeles Times
Marin Independent Journal
Montclarion
Pacific Sun
Palo Alto Daily News
Palo Alto Weekly
Pelican Media
Sacramento Bee
San Francisco Bay Guardian
San Francisco Chronicle
San Jose Mercury News
Santa Rosa Press Democrat
The Almanac
Vallejo Times-Herald
Wall Street Journal

Businesses

Acta Environmental
Adobe Systems
Advance Soil Technology, Inc.
Aerial Archives
Agilent Laboratories
Alcalde & Fay
ALZA Corporation
AMEC Earth & Environmental
American AgCredit
A-N West, Inc.
Anchor Environmental
Anderson Niswander, Inc.
Applied Marine Sciences
April Philips Design Work
Aquamarine Research
Archibald & Wallberg Consultants
Aspen Environmental Group
Avian Research Associates
Avocet Research Associates
Battelle
BEM Systems, Inc.
Biggs Cardoza Associates
Bill Wehner Photography
Blasland, Bouck and Lee
Boething Treeland Nursery
Brown & Caldwell

* Copies of the Draft EIS/R can be reviewed at these libraries.

Callander Associates
Caltest Analytical Laboratory
Campbell, George & Strong
Cardinal Photo
Cargill Salt
Castro Valley Environmental
Center for Development of Recycling
CH2M-Hill
Chow Engineering, Inc.
Coast & Harbor Engineering, LLC
Columbia Valuation Group
Concept Marine Associates
CONCUR
Contractors Information Network
CSL Developing Company
CWA
Dahlin Group
Dall & Associates
Danish Hydraulic Institute
Dinwiddie & Associates
Dirtmarket
Earth Tech
ECORP Consulting, Inc.
EDAW, Inc.
EIP Associates
ENTRIX, Inc.
Environmental Data Solutions
Environmental Science Associates
EnviroSystems Group
EOA, Inc.
Erler & Kalinowski, Inc.
ERS Inc.
Essex
Everest International Consultants
Exponent Inc.
FarWest Restoration Engineering
Fugro West, Inc.
G. Borchard & Associates
Gahagan & Bryant Associates, Inc.
GAIA Consulting, Inc.
Garcia and Associates
Geomatrix Consultants
GeoSea Consulting
Ginger Bryant & Associates
Grassetti Environmental Consulting (GECO)
Great Eastern Ecology, Inc.
Greenfield Management Strategies
H.T. Harvey & Associates
H2, INC.
Hanan & Associates, Inc.
Hancor, Inc.
HAN-PADRON ASSOCIATES, LLP
Hanson Environmental, Inc.
Harris & Company
HMH Inc.
Huffman-Broadway Group, Inc.
Hydro Science
Hydroikos Associates
Hydroscience Engineers, Inc.
Interland Development Company
Jensen Landscape Services Inc.
Jones & Stokes
K&AES, INC.
Kamman Hydrology & Engineering
Kier Associates/Institute for Fisheries Resouces
Kinnetic Laboratories, Inc.
Kleinfelder
Laurel Marcus and Associates
Law Offices of Shute, Mihaly, & Wineberger LLP
LFR Levine Fricke
LifeScan, Inc.
Lipton Environmental Group
Lockheed Martin Space Systems Company
Lowney Associates
LSA Associates, Inc.
MACTEC Engineering & Consulting
Malcolm Pirnie, Inc.
Mark Brown Digital Arts
McGuire and Hester Construction
MEC Analytical Systems Inc.
Mengup
Moffatt & Nichol Engineers
Moore Iacofano Goltsman, Inc.
Morrison & Foerster
Murray Engineering & Consulting
Murray, Burns, & Kienlen
National Semiconductor Corp.
Ninyo & Moore
Nolte Associates, Inc.
Northwest Hydraulics
Nova Albion Consulting
Nute Engineering
Ocean Sciences
Ocean US Consulting
Oklawaha Farms, Inc.
Pacific EcoRisk
Pacific Gas & Electric Company
Pacific International Engineering
Parametrix, Inc.
Phillip Williams & Associates
PM Strauss & Associates
QEA, LLC
RHAA
RMC
Royston Hanamoto Alley & Abey Landcsape Architects
S.R. Hansen & Associates
S.S. Papadopoulos & Associates
SAIC
Salmonberry Designs
Salon.com
Salt River Construction

Samwise Services
San Francisco Bay Brands
San Jose Water Company
Schaaf & Wheeler
Sea Engineering, Inc.
Sequoia Analytical Laboratories
Shaw Environmental, Inc.
SLR International
Solbes Consultants
SRI International
Stillwater Sciences
Sun Microsystems
Sycamore Associates
TDC Environmental
Teal Ltd.
Ted Winfield and Associates
Tetra Tech, Inc.
Thunder Mountain Enterprises
Tim Hilleary Construction
Towill, Inc.
Transight LLC / Bicycle Solutions
TranSystems
Treadwell & Rollo, Inc.
TRG & Associates
Union Pacific Railroad
URS Corporation
US Filter
USA Waste of San Jose
Vali Cooper & Associates, Inc.
Valley & Mountain Consulting
VIMS
Wallace Roberts & Todd, LLC
Wallis Engineering
Watershed Sciences
West Yost & Associates
Wetlands and Water Resources
Wetlands Research Associates, Inc.
Wetlands Wildlife Associates
Wildlands, Inc.
William Lettis & Associates
Winzler & Kelly Consulting Engineers
Wolfe Mason Associates
WRA, Inc.
Zanker Road Landfill
Zentner and Zentner

Individuals

William Ahern
Karim Al-Khafaji
Don Alvarado
Grace Alvarez
Ariel Ambruster
Sioux Ammerman
Dave Anderson
Susannah Anderson-Minshall
Rod Armstrong
Shannon Bane
Megha Bansal
Les Barclay
Susan Basu
Peter Baye
Laurianne Beacham
Andrew Beahrs
Robin Bell
Dan Belton
Bruce Bernard
Dave Bishop
Henry Blankenheim
Doug Bloyd
Scott Bourne
Bill Bousman
Dan Bowersox
Chris Bramblett
Amanda Breen
Joan Breiding
Tim Brewer
Brian Bruha
Robert Burco
Nancy Burge
Thomas Butler
Daniel Campbell
Phil Carpenter
Eric Carruthers
Anita Carse
Jose Casillas
Todd Catalini
Vincent Chiu
Anita Chow
Andrew Chung
Carl Claras
Robert Cone
Karla Conmy
Christine Corwin
Garth Cummings
Greg Cyr
TJ Dahlke
Brian David
Edwin Dean
Susan DeVico
Helen Dijkstra
Gabriel Dixon
Lance Dohman
Laurie Donnelly
Mike Dooley
Tom Driscoll
Cynthia Drozd
Daniel Duke
Mary Ann Duke
Inge Duncan
Mark Duncan
Melissa Dyer
Nana Effraim
Steve Eggert
Claire Elliot
John Epperson
Spence Everson
Rusty Fairey
Jesse Fairman
Helen Farnham
Margaret Fawcett
Steve Fiala
Katie Field
Corey Fong
Wendy Foss
Carole Foster
Betty Foster
William Frankeberger
Anna Frankel
Bill Frey
John Fritz
Carrie Fuener
Dave Fundakowski
Peter Gamino
Chris Gardner
Liz Gaudet
Lisa Gilmore
Richard Givens
Andrea Gleason
Riley Gordinier
Brad Goubeaux
Michael Graff
Cork Graham
Allison Green
Matt Greene
Sylvia Gregory
Matthew Greuel
Edward Gross
Cristina Grosso
Sandra Guerrero
Liz Haenel
Kim Hamilton
Srinivas Hanabe
Dennis Haussler
John S. Haydon
Dan Heimann
Jerry Heinrichs
Mark Hendren
Eric Hentschke
Yolanda Hernandez
Dylan Hewes
Jennifer Heyd
Gregory Hoffman

John Hollingsworth
Tom Horan
Carolyn Hovig
Monica Hudson
Denise Hughes
Scott Hunter
M.V. Inocencio
Robert Jakovina
Kristal Janes
Anne Janzer
Lance Jensen
Rochelle Johnson
Travis Johnson
Frank Johnson
Dan Johnston
Kelly Jost
Sheila Junge
Anne Jurek
Frank Kellers
Paul King
Gordon Knapp
Daniel Kohn
Tom Kondo
Fred Krieger
Thomas Laine
Bart Laine
George Lallas
Bryan Lapine
Ryan Lau
Jerry Lawrence
Aaron Lee
Don Lepley
Bill Lev
Robert Lico
Dan Liddell
Cynthia Lipford
Bill Lock
John Lukas
Joseph Lutzweit

Tom Madalena
Alberta Maged
John Magee
Dean Manley
Michael Marangio
John Margowski
Kim Martin
Olivier Mazeas
Jim McGrath
John McKenney
Nancy McKown
Nancy McNally
Michael Millar
Mike Miller
Julia Miller
Gaurav Misra
Kevan Moffett
Betty Moose
Maritza Mullen
David Mum
Ryan Murphy
Dan Murphy
Jim Murray
Jean Myers
Mike Myers
John Neibel
Megan Nesland
Denis Newman
John Nguyen
Wes Nichols
Alex Niedzielski
Philip S. Nones
Angela Obando
Rich Ober
Davinna Ohlson
Aaron Parr
Erica Partridge
Chris Paterson
Dave Paullin

Roy Peek
Heidi Peirce
Tom Phillips
Anne Pinckard
Alan Pobanz
Heather Pohl
Jim Pollock
Eric Polson
Brian Potter
Roy Powers
John Preston
David Ralston
Evan Raymond
Bill Reddy
Tim Reed
Jay Reed
Jeff Reese
Marnie Regen
Paul Reisentz
Ken Reuther
Robert Reynolds
Don Richardson
Marijke Rijsberman
Andrew Rist
Jill Rooth
John Roselli
Wayne Roth
Pati Rouzer
Aariel Rowan
Mike Rugg
Carol Runge
Steve Rutledge
Greg Saiz
Edward Salinas
Red Schlichting
Ann Schneider
Kristin Schuster
Rob Schusteritsch
Drew Seutter

Danny Shewey
Jeff Sicklesteel
Jill Singleton
Kyle Smith
Carolyn Smyth
Carolyn Strange
Carolyn Straub
Terrence Sullins
Barbara Sulser
Janet Talbert
Nancy Teater
Frank Teng
Steve Teves
Joe Thomas
Helen Thompson
David Thomson
Julie Thrower
Ralph Toloski
Samantha Treadwell
Harriet Trezevant
Ashutosh Tripathi
Mari Tusten
Robert Venticinque
Amber Vierling
Michael Wasmann
Wendy Webster
Don Weden
Jennifer Weeks
Bruce Wilcox
Melinda Wilson
Mary Wisnewski
Darrin Woods
Greg Woods
Katherine Wright
David Yehle
Wendy Young
Chris Zable

10. INDEX

A

Adaptive management, ES-4, ES-17, ES-18, ES-20, ES-54, ES-55, ES-56, 1-23, 3.1-5, 3.1-6, 3.3-45, 3.3-51, 3.3-52, 3.3-53, 3.3-55, 3.3-64, 3.3-65, 3.3-71, 3.4-25, 3.4-30, 3.4-45, 3.4-56, 3.4-58, 3.4-59, 3.4-60, 3.4-63, 3.4-64, 3.4-65, 3.4-66, 3.4-68, 3.4-69, 3.4-70, 3.4-73, 3.4-74, 3.4-75, 3.4-78, 3.4-79, 3.4-80, 3.4-92, 3.4-93, 3.4-95, 3.4-96, 3.4-97, 3.6-52, 3.6-54, 3.6-60, 3.6-61, 3.6-64, 3.6-65, 3.6-67, 3.6-68, 3.6-69, 3.6-70, 3.6-72, 3.6-73, 3.6-75, 3.6-80, 3.6-81, 3.6-83, 3.6-89, 3.6-90, 3.6-92, 3.6-93, 3.6-97, 3.6-98, 3.6-99, 3.6-100, 3.6-103, 3.6-104, 3.6-105, 3.6-109, 3.6-110, 3.6-111, 3.6-120, 3.6-121, 3.6-122, 3.6-124, 3.6-131, 3.6-135, 3.6-136, 3.6-137, 3.6-141, 3.6-142, 3.6-143, 3.6-145, 3.6-146, 3.6-147, 3.6-148, 3.6-150, 3.6-151, 3.6-159, 3.6-160, 3.6-181, 3.6-197, 3.6-198, 3.6-201, 3.6-203, 3.10-5, 3.10-7, 3.17-12, 4-34, 4-35, 4-37, 4-38, 4-39, 4-40, 4-54, 4-55, 4-56, 4-58, 4-64, 4-66, 4-67, 4-83, 4-87, 4-88, 4-89, 4-90, 4-99

Adaptive Management Plan, description of, 2-10

Adaptive Management Summary Table, 2-15

Air Quality, ES-30, ES-41, ES-43, ES-52, 1-37, 3.1-2, 3.1-6, 3.9-29, 3.11-11, 3.14-1, 3.14-2, 3.14-4, 3.14-6, 3.14-7, 3.14-8, 3.14-9, 3.14-10, 3.14-11, 3.14-12, 3.14-13, 3.14-14, 3.14-15, 3.14-16, 3.14-17, 3.14-19, 3.14-20, 3.14-21, 3.14-22, 3.14-23, 3.14-25, 3.14-27, 3.14-28, 3.14-30, 3.14-32, 3.14-34, 3.14-36, 4-3, 4-5, 4-6, 4-21, 4-104, 4-118, 4-119, 4-120, 4-121, 4-123, 5-5, 6-8

Alameda County, 1-2, 1-5, 1-25, 1-30, 1-32, 3.2-1, 3.3-1, 3.3-26, 3.3-42, 3.3-44, 3.3-57, 3.4-4, 3.4-41, 3.4-43, 3.4-46, 3.5-18, 3.5-25, 3.6-50, 3.7-18, 3.7-22, 3.8-11, 3.8-13, 3.8-15, 3.8-16, 3.9-3, 3.9-15, 3.9-25, 3.9-26, 3.10-1, 3.10-3, 3.10-4, 3.11-4, 3.13-8, 3.14-10, 3.15-1, 3.15-2, 3.15-9, 3.15-11, 3.16-2, 3.16-9, 4-14, 4-15

Alameda County Flood Control District (ACFCD), 3.15-9, 3.16-9

Alternative A, description of, 2-45

Alternative B, description of, 2-54

Alternative C, description of, 2-75

Alviso, community of, 1-35, 3.3-24, 3.3-27, 3.3-51, 3.3-53, 3.3-67, 3.3-73, 3.3-76, 3.6-33, 3.7-8, 3.8-2, 3.8-3, 3.8-18, 3.8-20, 3.8-36, 3.9-3, 3.9-8, 3.9-22, 3.12-3, 3.13-7, 3.13-9, 3.14-13, 3.16-23, 3.16-24, 3.16-33, 3.16-36, 3.17-3, 4-134, 4-135

Aquatic, see Biological Resources, Aquatic.

Archaeological resources, see Section 3.8, Cultural Resources.

B

Basin Plan, 3.3-24, 3.4-2, 3.4-11, 3.4-44, 3.4-46, 3.4-47, 3.4-48, 3.4-49, 3.4-50, 3.4-51, 3.4-54, 3.4-57, 3.4-58, 3.4-61, 3.4-74, 3.6-47, 3.6-48, 3.8-57, 3.9-9, 3.9-10, 3.10-3, 3.16-1, 3.16-21

Bay Plan, 1-37, 3.3-40, 3.6-47, 3.7-19, 3.7-20, 3.7-21, 3.9-9, 3.9-12

Bicycling, 3.6-49, 3.7-2, 3.7-3, 3.7-4, 3.7-23, 3.9-19, 3.9-21, 3.9-22, 3.11-9

Biological Resources, ES-25, ES-35, ES-47, ES-54, 1-38, 3.1-1, 3.6-1, 3.6-45, 3.6-50, 3.6-51, 3.6-52, 3.6-53, 3.6-54, 3.6-58, 3.6-61, 3.6-118, 3.6-120, 3.6-121, 3.6-132, 3.6-133, 3.6-134, 3.6-135, 3.6-141, 3.6-180, 3.6-181, 3.6-193, 3.9-11, 3.10-4, 3.11-2, 3.11-8, 3.17-6, 4-53, 4-54, 4-73, 4-74, 4-75, 4-76, 4-83, 5-2, 5-3

Aquatic, 1-10, 1-13, 3.4-2, 3.4-4, 3.4-7, 3.4-8, 3.4-47, 3.4-48, 3.4-49, 3.4-50, 3.4-57, 3.4-58, 3.4-59, 3.4-60, 3.4-61, 3.4-65, 3.4-67, 3.4-69, 3.4-76, 3.4-78, 3.6-3, 3.6-5, 3.6-6, 3.6-10, 3.6-11, 3.6-13, 3.6-21, 3.6-23, 3.6-31, 3.6-45, 3.6-46, 3.6-48, 3.6-96, 3.6-100, 3.6-102, 3.6-124, 3.6-128, 3.6-147, 3.6-182, 3.7-18, 3.7-19, 3.9-13, 3.10-1, 6-1, 6-2, 6-3, 6-6, 6-7, 6-9, 6-10
Vegetation, ES-32, ES-38, ES-42, 1-11, 1-33, 1-35, 1-36, 3.2-3, 3.3-14, 3.3-18, 3.3-23, 3.3-27, 3.3-28, 3.3-61, 3.3-76, 3.4-4, 3.4-77, 3.4-78, 3.4-86, 3.6-1, 3.6-3, 3.6-5, 3.6-6, 3.6-9, 3.6-10, 3.6-11, 3.6-12, 3.6-13, 3.6-16, 3.6-18, 3.6-20, 3.6-21, 3.6-23, 3.6-31, 3.6-33, 3.6-34, 3.6-44, 3.6-46, 3.6-62, 3.6-68, 3.6-69, 3.6-70, 3.6-72, 3.6-74, 3.6-78, 3.6-102, 3.6-118, 3.6-126, 3.6-132, 3.6-140, 3.6-141, 3.6-142, 3.6-144, 3.6-155, 3.6-190, 3.6-196, 3.6-198, 3.6-199, 3.8-1, 3.8-36, 3.8-39, 3.8-40, 3.8-41, 3.8-57, 3.8-58, 3.9-10, 3.9-27, 3.10-7, 3.10-9, 3.10-10, 3.14-24, 3.14-30, 3.14-38, 3.16-17, 3.17-2, 3.17-3, 3.17-4, 3.17-5, 3.17-6, 3.17-9, 3.17-10, 3.17-12, 3.17-13, 3.17-14, 3.17-15, 3.17-18, 4-27, 4-31, 4-35, 4-37, 4-38, 4-39, 4-54, 4-57, 4-87, 4-98, 4-129, 4-130, 4-139, 4-140, 6-5, 6-6, 6-10
Wildlife, ES-1, ES-25, ES-26, ES-27, ES-47, ES-48, ES-49, ES-54, ES-57, 1-1, 1-7, 1-10, 1-13, 1-14, 1-18, 3.2-4, 3.2-5, 3.3-23, 3.3-41, 3.4-25, 3.4-47, 3.4-49, 3.4-51, 3.4-54, 3.4-55, 3.4-58, 3.4-59, 3.4-60, 3.4-76, 3.4-79, 3.4-80, 3.4-81, 3.4-82, 3.4-85, 3.6-1, 3.6-3, 3.6-9, 3.6-11, 3.6-12, 3.6-13, 3.6-16, 3.6-19, 3.6-20, 3.6-23, 3.6-24, 3.6-28, 3.6-31, 3.6-34, 3.6-35, 3.6-37, 3.6-41, 3.6-45, 3.6-46, 3.6-47, 3.6-48, 3.6-50, 3.6-51, 3.6-53, 3.6-55, 3.6-57, 3.6-58, 3.6-60, 3.6-69, 3.6-70, 3.6-71, 3.6-73, 3.6-76, 3.6-78, 3.6-113, 3.6-114, 3.6-116, 3.6-118, 3.6-119, 3.6-132, 3.6-134, 3.6-135, 3.6-136, 3.6-137, 3.6-146, 3.6-147, 3.6-154, 3.6-175, 3.6-176, 3.6-177, 3.6-178, 3.6-180, 3.6-181, 3.6-192, 3.6-199, 3.6-200, 3.7-2, 3.7-3, 3.7-4, 3.7-5, 3.7-6, 3.7-7, 3.7-11, 3.7-13, 3.7-14, 3.7-18, 3.7-19, 3.7-20, 3.7-21, 3.7-23, 3.7-27, 3.7-28, 3.7-31, 3.7-32, 3.8-39, 3.9-1, 3.9-3, 3.9-10, 3.9-11, 3.9-12, 3.9-14, 3.9-15, 3.9-16, 3.9-19, 3.9-20, 3.9-21, 3.9-22, 3.9-23, 3.9-24, 3.9-25, 3.9-27, 3.9-28, 3.9-29, 3.9-30, 3.11-9, 3.11-12, 3.12-4, 3.13-6, 3.13-12, 3.13-22, 3.16-11, 3.16-12, 3.17-6, 3.17-9, 3.17-17, 4-1, 4-7, 4-16, 4-17, 4-21, 4-57, 4-72, 4-73, 4-75, 4-83, 4-88, 4-89, 5-2, 5-5, 6-2, 6-3

C

California Department of Fish and Game (CDFG), ES-1, ES-2, ES-35, ES-39, ES-42, ES-42, ES-43, ES-54, 1-1, 1-2, 1-5, 1-7, 1-8, 1-9, 1-14, 1-23, 1-32, 1-34, 1-36, 3.3-17, 3.3-19, 3.3-41, 3.3-44, 3.3-57, 3.3-75, 3.4-1, 3.4-28, 3.4-37, 3.4-38, 3.4-90, 3.4-101, 3.5-18, 3.5-25, 3.6-1, 3.6-11, 3.6-37, 3.6-46, 3.6-47, 3.6-48, 3.6-51, 3.6-87, 3.6-94, 3.6-114, 3.6-115, 3.6-117, 3.6-119, 3.6-124, 3.6-138, 3.6-148, 3.6-149, 3.6-179, 3.6-181, 3.6-200, 3.6-201, 3.7-1, 3.7-2, 3.7-7, 3.7-8, 3.7-10, 3.7-11, 3.7-17, 3.7-18, 3.7-21, 3.7-25, 3.7-27, 3.7-28, 3.9-1, 3.9-3, 3.11-3, 3.11-7, 3.11-12, 3.11-13, 3.12-3, 3.12-10, 3.12-14, 3.12-15, 3.13-8, 3.14-10, 3.14-24, 3.14-27, 3.14-28, 4-1, 4-16, 4-17, 4-30, 4-88, 4-89, 4-126, 4-127, 6-3
California ESA, 3.6-48
California State Coastal Conservancy (Conservancy), ES-17, 1-5, 1-14, 1-23, 1-27, 1-29, 1-32, 3.3-2, 3.6-8, 3.6-141, 3.9-9, 3.9-14, 3.9-15
Caltrans, 3.3-36, 3.12-2, 3.12-3, 3.12-4, 3.12-5, 3.12-17, 3.13-20, 3.13-29, 3.13-35, 4-18
Cargill, ES-2, ES-21, 1-1, 1-2, 1-11, 1-13, 1-14, 1-25, 1-27, 1-32, 1-39, 3.2-1, 3.3-16, 3.3-18, 3.3-20, 3.3-22, 3.3-30, 3.3-33, 3.3-36, 3.3-38, 3.3-73, 3.4-16, 3.4-38, 3.4-43, 3.4-101, 3.5-26, 3.6-12, 3.6-15, 3.6-19, 3.6-23, 3.6-53, 3.6-64, 3.6-65, 3.6-77, 3.6-82, 3.6-85, 3.6-88, 3.6-94, 3.6-95, 3.6-97, 3.6-102, 3.6-103, 3.6-106, 3.6-118, 3.6-127, 3.6-128, 3.7-7, 3.7-8, 3.7-11, 3.7-21, 3.7-30, 3.8-36, 3.9-1, 3.9-3, 3.9-10, 3.9-14, 3.9-22, 3.9-23, 3.13-9, 3.17-13, 4-60, 4-64, 4-68, 4-75, 4-79

Clean Air Act (CAA), 3.14-14, 3.14-15, 3.14-16, 5-5, 6-8
Clean Water Act, 1-36, 3.3-39, 3.3-40, 3.4-44, 3.4-45, 3.4-54, 3.6-45, 3.6-47, 3.6-48, 3.6-51, 3.7-27, 6-12
Contaminants, ES-24, ES-32, ES-34, ES-43, ES-46, ES-52, 3.4-2, 3.4-8, 3.4-17, 3.4-36, 3.4-37, 3.4-60, 3.4-68, 3.4-75, 3.4-79, 3.4-82, 3.4-83, 3.4-84, 3.4-85, 3.4-86, 3.4-87, 3.4-99, 3.4-100, 3.14-1, 3.14-9, 3.14-18, 3.14-27, 3.14-28, 3.14-37, 3.14-38, 4-32, 4-40, 4-42, 4-43, 4-121, 6-5, 6-7, 6-13
Cultural Landscape, ES-28, ES-36, ES-38, ES-50, 3.8-38, 3.8-39, 3.8-49, 3.8-52, 3.8-54, 3.8-55, 3.8-56, 3.8-59, 3.8-60, 4-95, 4-96
Cultural Resources, ES-4, ES-28, ES-36, ES-37, ES-38, ES-50, 1-38, 3.1-2, 3.2-4, 3.2-5, 3.7-30, 3.8-1, 3.8-2, 3.8-3, 3.8-7, 3.8-30, 3.8-31, 3.8-32, 3.8-34, 3.8-35, 3.8-36, 3.8-37, 3.8-39, 3.8-42, 3.8-43, 3.8-44, 3.8-45, 3.8-46, 3.8-47, 3.8-48, 3.8-49, 3.8-50, 3.8-51, 3.8-52, 3.8-53, 3.8-54, 3.8-55, 3.8-56, 3.8-57, 3.8-58, 3.8-59, 3.8-60, 4-94, 4-95, 4-96, 5-3
Cultural resources, see Section 3.8, Cultural Resources.
Cumulative Impacts, ES-21, ES-22, ES-45, ES-46, ES-47, ES-48, ES-49, ES-50, ES-51, ES-52, ES-53, 1-36, 4-1, 4-2, 4-7, 4-8, 4-14, 4-18, 4-20, 4-21, 4-22, 4-23, 4-24, 4-25, 4-26, 4-27, 4-29, 4-30, 4-31, 4-32, 4-33, 4-34, 4-35, 4-36, 4-37, 4-38, 4-39, 4-40, 4-42, 4-43, 4-44, 4-45, 4-46, 4-47, 4-48, 4-49, 4-50, 4-51, 4-52, 4-53, 4-55, 4-56, 4-57, 4-58, 4-59, 4-60, 4-61, 4-62, 4-63, 4-64, 4-65, 4-66, 4-67, 4-68, 4-69, 4-70, 4-71, 4-72, 4-73, 4-74, 4-75, 4-76, 4-77, 4-78, 4-79, 4-80, 4-81, 4-83, 4-84, 4-85, 4-86, 4-87, 4-88, 4-89, 4-91, 4-92, 4-93, 4-94, 4-95, 4-96, 4-97, 4-98, 4-99, 4-100, 4-101, 4-102, 4-103, 4-104, 4-105, 4-106, 4-107, 4-108, 4-109, 4-110, 4-111, 4-112, 4-113, 4-114, 4-115, 4-116, 4-117, 4-118, 4-119, 4-120, 4-121, 4-122, 4-123, 4-124, 4-125, 4-126, 4-127, 4-128, 4-129, 4-130, 4-131, 4-132, 4-133, 4-134, 4-135, 4-136, 4-137, 4-138, 4-139, 4-140, 5-1

D

Dissolved oxygen (DO), ES-23, ES-45, 1-33, 3.2-3, 3.3-35, 3.4-1, 3.4-4, 3.4-14, 3.4-16, 3.4-27, 3.4-28, 3.4-29, 3.4-47, 3.4-48, 3.4-49, 3.4-50, 3.4-51, 3.4-56, 3.4-57, 3.4-58, 3.4-61, 3.4-62, 3.4-65, 3.4-66, 3.4-67, 3.4-68, 3.4-69, 3.4-70, 3.4-76, 3.4-77, 3.4-78, 3.4-82, 3.4-91, 3.4-93, 3.4-94, 3.4-95, 3.4-97, 3.4-98, 3.6-122, 3.6-124, 3.6-148, 3.6-149, 3.6-150, 3.6-151, 3.6-201, 3.6-203, 3.11-8, 4-32, 4-34, 4-35, 4-36, 4-88, 4-90, 6-1, 6-4, 6-6

E

East Palo Alto, 1-30, 3.3-11, 3.3-36, 3.4-35, 3.4-38, 3.4-41, 3.7-4, 3.7-8, 3.7-21, 3.8-10, 3.8-16, 3.8-47, 3.9-1, 3.9-9, 3.9-26, 3.11-1, 3.11-3, 3.11-6, 3.12-1, 3.13-9, 3.13-15, 3.14-14, 3.15-5, 3.15-6, 3.15-8, 3.15-12, 3.16-6, 3.17-10, 4-15, 4-16
Endangered species, ES-30, ES-54, 1-10, 1-24, 1-35, 1-36, 3.4-47, 3.6-108, 3.9-16, 3.16-11, 3.16-12, 3.16-13, 3.16-25, 3.16-27, 4-16, 4-125, 4-126, 5-2, 6-3, 6-11, 6-12
ESA, see Federal Endangered Species Act.

F

Federal Endangered Species Act (ESA), 3.6-45, 3.7-27, 5-2
Fish, see Biological Resources, Aquatic.
Fishing, 3.3-7, 3.7-2, 3.7-5, 3.7-8, 3.7-10, 3.7-11, 3.7-13, 3.7-17, 3.7-18, 3.7-19, 3.7-21, 3.8-6, 3.8-9, 3.8-41, 3.9-19, 3.9-21, 3.11-2, 3.11-3, 3.11-9, 4-8, 4-18

Flooding, 1-10, 1-33, 1-36, 3.1-5, 3.2-3, 3.2-4, 3.2-5, 3.3-9, 3.3-10, 3.3-11, 3.3-14, 3.3-16, 3.3-17, 3.3-18, 3.3-24, 3.3-26, 3.3-28, 3.3-32, 3.3-35, 3.3-36, 3.3-38, 3.3-41, 3.3-43, 3.3-44, 3.3-45, 3.3-46, 3.3-48, 3.3-49, 3.3-50, 3.3-51, 3.3-52, 3.3-53, 3.3-54, 3.3-55, 3.3-59, 3.3-62, 3.3-63, 3.3-64, 3.3-66, 3.3-67, 3.3-68, 3.3-73, 3.4-18, 3.4-45, 3.4-90, 3.5-19, 3.5-20, 3.5-21, 3.5-23, 3.5-29, 3.6-10, 3.6-12, 3.6-50, 3.6-117, 3.6-144, 3.6-158, 3.8-20, 3.8-51, 3.8-54, 3.8-56, 3.8-59, 3.11-8, 3.11-9, 3.11-10, 3.11-12, 3.11-13, 3.14-29, 3.15-9, 3.16-9, 4-22, 4-24, 4-25, 4-27, 4-28, 4-48, 4-49, 4-50, 4-51, 4-94, 4-96, 4-104, 6-5, 6-7, 6-8

Fremont, ES-2, ES-40, 1-2, 1-7, 3.3-11, 3.3-16, 3.3-19, 3.3-26, 3.3-27, 3.4-6, 3.4-35, 3.4-36, 3.4-38, 3.5-8, 3.6-14, 3.6-33, 3.6-38, 3.6-39, 3.6-41, 3.6-138, 3.7-8, 3.7-11, 3.7-21, 3.7-22, 3.8-10, 3.8-13, 3.8-44, 3.9-1, 3.9-3, 3.9-9, 3.9-21, 3.11-1, 3.11-2, 3.11-4, 3.12-2, 3.13-8, 3.13-11, 3.13-24, 3.14-10, 3.14-11, 3.14-12, 3.15-2, 3.15-3, 3.15-9, 3.16-2, 3.16-4, 3.16-9, 3.16-22, 3.17-4, 3.17-6, 3.17-7, 4-4, 4-5, 4-15, 4-16, 4-60, 4-62

G

Geology, see Section 3.5, Geology, Soils and Seismicity.

H

Hayward, ES-40, 1-2, 1-7, 3.3-4, 3.3-11, 3.3-19, 3.4-32, 3.5-3, 3.5-5, 3.5-8, 3.5-9, 3.5-13, 3.5-14, 3.5-15, 3.5-22, 3.6-84, 3.6-108, 3.7-2, 3.7-8, 3.7-21, 3.7-22, 3.8-8, 3.8-13, 3.8-26, 3.8-43, 3.9-1, 3.9-3, 3.9-9, 3.9-17, 3.11-1, 3.11-2, 3.11-4, 3.11-5, 3.12-1, 3.12-2, 3.12-3, 3.12-16, 3.12-17, 3.13-8, 3.13-10, 3.13-11, 3.13-24, 3.13-30, 3.13-34, 3.14-11, 3.15-1, 3.15-2, 3.15-9, 3.16-2, 3.16-9, 3.17-5, 3.17-6, 4-4, 4-5, 4-18, 4-60

Hydrology, ES-23, ES-32, ES-45, ES-54, 1-30, 1-34, 3.1-1, 3.3-1, 3.3-2, 3.3-26, 3.3-43, 3.4-1, 3.4-30, 3.4-34, 3.4-36, 3.4-42, 3.4-45, 3.4-89, 3.4-90, 3.5-15, 3.5-18, 3.5-23, 3.6-20, 3.9-13, 3.9-16, 3.9-20, 3.10-4, 3.10-9, 3.11-8, 3.11-9, 3.11-10, 3.11-12, 3.11-13, 4-14, 4-22, 5-4, 6-5, 6-6

K

Kayaking, 3.3-75, 3.4-85, 3.6-103, 3.6-106, 3.6-132, 3.6-136, 3.6-192, 3.7-6, 3.7-17, 3.7-33, 3.11-9, 3.12-11, 3.12-17, 3.12-18, 3.13-22, 3.13-33, 3.17-13, 4-91, 4-92, 4-93, 4-103

L

Land Use, ES-28, ES-38, ES-40, ES-41, ES-50, 1-2, 1-33, 3.1-2, 3.2-3, 3.2-4, 3.2-5, 3.3-9, 3.3-19, 3.3-43, 3.4-5, 3.4-41, 3.6-5, 3.6-13, 3.6-14, 3.7-20, 3.7-21, 3.7-22, 3.8-39, 3.8-40, 3.8-41, 3.8-46, 3.8-48, 3.9-1, 3.9-3, 3.9-4, 3.9-5, 3.9-7, 3.9-8, 3.9-9, 3.9-10, 3.9-11, 3.9-13, 3.9-14, 3.9-16, 3.9-17, 3.9-19, 3.9-20, 3.9-21, 3.9-22, 3.9-23, 3.9-24, 3.9-25, 3.9-26, 3.9-27, 3.9-28, 3.9-29, 3.9-30, 3.11-5, 3.11-11, 3.11-12, 3.12-2, 3.12-10, 3.13-6, 3.13-7, 3.13-8, 3.13-9, 3.13-10, 3.13-11, 3.13-12, 3.13-13, 3.13-14, 3.13-15, 3.13-16, 3.13-24, 3.13-25, 3.13-26, 3.13-30, 3.13-31, 3.14-11, 3.14-13, 3.14-14, 3.14-19, 3.15-9, 3.15-11, 3.16-8, 3.16-23, 3.17-2, 3.17-7, 3.17-8, 4-2, 4-3, 4-97, 4-98, 4-104, 4-111, 4-116, 4-125, 4-139, 5-4, 6-3, 6-8

Levees, ES-4, ES-5, ES-23, ES-24, ES-31, ES-38, ES-41, ES-44, ES-45, ES-46, ES-53, 1-10, 1-25, 1-27, 1-33, 1-34, 1-35, 1-36, 1-37, 1-38, 3.2-2, 3.2-3, 3.3-1, 3.3-9, 3.3-10, 3.3-11, 3.3-14, 3.3-15, 3.3-16, 3.3-18, 3.3-19, 3.3-20, 3.3-22, 3.3-23, 3.3-26, 3.3-27, 3.3-28, 3.3-30, 3.3-32, 3.3-33, 3.3-35, 3.3-36, 3.3-38, 3.3-41, 3.3-44, 3.3-45, 3.3-46, 3.3-47, 3.3-48, 3.3-49, 3.3-50, 3.3-51, 3.3-52, 3.3-53, 3.3-54,

3.3-55, 3.3-56, 3.3-57, 3.3-58, 3.3-59, 3.3-61, 3.3-62, 3.3-63, 3.3-64, 3.3-66, 3.3-67, 3.3-68, 3.3-69, 3.3-70, 3.3-71, 3.3-72, 3.3-73, 3.3-74, 3.3-75, 3.3-77, 3.4-1, 3.4-33, 3.4-35, 3.4-43, 3.4-51, 3.4-57, 3.4-62, 3.4-63, 3.4-64, 3.4-67, 3.4-70, 3.4-71, 3.4-73, 3.4-78, 3.4-79, 3.4-82, 3.4-83, 3.4-84, 3.4-85, 3.4-88, 3.4-89, 3.4-90, 3.4-92, 3.4-93, 3.4-94, 3.4-95, 3.4-96, 3.4-99, 3.4-100, 3.4-101, 3.5-14, 3.5-15, 3.5-16, 3.5-17, 3.5-18, 3.5-19, 3.5-20, 3.5-21, 3.5-22, 3.5-23, 3.5-24, 3.5-25, 3.5-26, 3.5-27, 3.5-28, 3.5-29, 3.5-30, 3.6-6, 3.6-7, 3.6-9, 3.6-11, 3.6-12, 3.6-13, 3.6-14, 3.6-16, 3.6-18, 3.6-19, 3.6-20, 3.6-21, 3.6-24, 3.6-31, 3.6-32, 3.6-33, 3.6-34, 3.6-36, 3.6-41, 3.6-43, 3.6-44, 3.6-61, 3.6-62, 3.6-63, 3.6-71, 3.6-72, 3.6-73, 3.6-75, 3.6-76, 3.6-77, 3.6-81, 3.6-84, 3.6-85, 3.6-86, 3.6-87, 3.6-90, 3.6-91, 3.6-108, 3.6-112, 3.6-113, 3.6-114, 3.6-116, 3.6-118, 3.6-119, 3.6-122, 3.6-132, 3.6-133, 3.6-136, 3.6-138, 3.6-139, 3.6-140, 3.6-142, 3.6-143, 3.6-145, 3.6-150, 3.6-151, 3.6-152, 3.6-154, 3.6-156, 3.6-157, 3.6-158, 3.6-159, 3.6-160, 3.6-162, 3.6-163, 3.6-164, 3.6-167, 3.6-170, 3.6-175, 3.6-176, 3.6-177, 3.6-178, 3.6-179, 3.6-181, 3.6-182, 3.6-192, 3.6-193, 3.6-194, 3.6-195, 3.6-196, 3.6-198, 3.7-11, 3.7-15, 3.7-17, 3.7-24, 3.7-28, 3.7-29, 3.7-30, 3.7-31, 3.7-32, 3.7-33, 3.7-34, 3.8-1, 3.8-4, 3.8-16, 3.8-20, 3.8-30, 3.8-31, 3.8-34, 3.8-36, 3.8-37, 3.8-49, 3.8-51, 3.8-53, 3.8-54, 3.8-56, 3.8-57, 3.8-58, 3.8-59, 3.8-60, 3.9-13, 3.9-20, 3.9-21, 3.9-29, 3.9-30, 3.10-5, 3.10-6, 3.10-8, 3.11-3, 3.11-8, 3.11-9, 3.11-10, 3.11-13, 3.12-3, 3.12-4, 3.12-6, 3.12-8, 3.13-19, 3.13-21, 3.13-23, 3.13-25, 3.13-26, 3.13-27, 3.13-29, 3.14-22, 3.14-24, 3.14-29, 3.14-31, 3.14-34, 3.15-12, 3.15-13, 3.16-1, 3.16-4, 3.16-11, 3.16-12, 3.16-13, 3.16-15, 3.16-16, 3.16-17, 3.16-19, 3.16-20, 3.16-21, 3.16-23, 3.16-24, 3.16-25, 3.16-26, 3.16-27, 3.16-28, 3.16-29, 3.16-30, 3.16-31, 3.16-32, 3.16-33, 3.16-35, 3.16-36, 3.16-37, 3.17-1, 3.17-3, 3.17-4, 3.17-5, 3.17-11, 3.17-12, 3.17-13, 3.17-14, 3.17-15, 3.17-16, 3.17-17, 4-6, 4-7, 4-15, 4-25, 4-27, 4-29, 4-30, 4-32, 4-33, 4-46, 4-47, 4-48, 4-49, 4-50, 4-51, 4-52, 4-53, 4-60, 4-62, 4-72, 4-83, 4-84, 4-85, 4-86, 4-87, 4-89, 4-92, 4-93, 4-96, 4-101, 4-102, 4-103, 4-125, 4-128, 4-129, 4-130, 4-132, 4-134, 4-135, 4-136, 4-137, 4-138, 4-139, 4-140, 5-1, 5-2, 6-2, 6-3, 6-7, 6-9

M

Menlo Park, ES-40, 1-2, 1-7, 1-30, 3.3-2, 3.3-36, 3.4-35, 3.4-38, 3.4-41, 3.6-193, 3.7-4, 3.7-21, 3.7-23, 3.7-24, 3.7-33, 3.8-18, 3.8-46, 3.9-1, 3.9-8, 3.9-9, 3.9-23, 3.9-24, 3.11-1, 3.11-2, 3.11-4, 3.12-1, 3.12-5, 3.13-9, 3.13-14, 3.13-25, 3.13-31, 3.13-35, 3.15-5, 3.15-6, 3.15-7, 3.15-8, 3.15-11, 3.15-12, 3.16-6, 3.16-10, 3.17-8, 4-4, 4-5, 4-15, 4-16, 4-18

Mercury, ES-24, ES-46, ES-56, 3.4-1, 3.4-2, 3.4-4, 3.4-5, 3.4-6, 3.4-7, 3.4-12, 3.4-16, 3.4-17, 3.4-18, 3.4-21, 3.4-24, 3.4-25, 3.4-26, 3.4-27, 3.4-29, 3.4-50, 3.4-51, 3.4-52, 3.4-53, 3.4-54, 3.4-55, 3.4-56, 3.4-59, 3.4-60, 3.4-71, 3.4-72, 3.4-73, 3.4-74, 3.4-75, 3.4-76, 3.4-77, 3.4-78, 3.4-79, 3.4-80, 3.4-81, 3.4-82, 3.4-83, 3.4-85, 3.4-95, 3.4-96, 3.4-97, 3.4-98, 3.4-99, 3.5-5, 3.6-130, 3.6-131, 3.6-190, 3.8-18, 3.8-20, 3.14-27, 3.14-37, 4-36, 4-37, 4-38, 4-39, 4-40, 4-41, 4-82, 6-7

Milpitas, 1-27, 3.3-11, 3.3-26, 3.4-84, 3.4-101, 3.6-14, 3.6-33, 3.7-8, 3.7-21, 3.8-1, 3.8-22, 3.8-31, 3.8-32, 3.8-33, 3.8-36, 3.9-1, 3.9-9, 3.9-26, 3.11-1, 3.12-2, 3.12-16, 3.16-6

Monitoring, ES-4, ES-18, ES-26, ES-32, ES-33, ES-34, ES-36, ES-43, ES-48, ES-54, ES-56, 1-8, 1-9, 1-23, 1-38, 1-39, 3.1-5, 3.1-8, 3.3-1, 3.3-6, 3.3-32, 3.3-45, 3.3-51, 3.3-52, 3.3-53, 3.3-55, 3.3-64, 3.3-65, 3.3-70, 3.3-71, 3.4-1, 3.4-2, 3.4-4, 3.4-5, 3.4-6, 3.4-8, 3.4-9, 3.4-12, 3.4-13, 3.4-14, 3.4-15, 3.4-16, 3.4-17, 3.4-26, 3.4-27, 3.4-28, 3.4-34, 3.4-35, 3.4-36, 3.4-37, 3.4-38, 3.4-39, 3.4-41, 3.4-45, 3.4-46, 3.4-54, 3.4-57, 3.4-59, 3.4-60, 3.4-61, 3.4-63, 3.4-64, 3.4-65, 3.4-66, 3.4-68, 3.4-69, 3.4-70, 3.4-72, 3.4-73, 3.4-74, 3.4-75, 3.4-76, 3.4-78, 3.4-79, 3.4-80, 3.4-81, 3.4-82, 3.4-85, 3.4-86, 3.4-87, 3.4-91, 3.4-95, 3.4-96, 3.4-97, 3.6-15, 3.6-24, 3.6-31, 3.6-34, 3.6-50, 3.6-52, 3.6-53, 3.6-54, 3.6-58,

3.6-60, 3.6-61, 3.6-64, 3.6-65, 3.6-66, 3.6-67, 3.6-68, 3.6-69, 3.6-71, 3.6-72, 3.6-73, 3.6-77, 3.6-78, 3.6-79, 3.6-80, 3.6-82, 3.6-83, 3.6-85, 3.6-88, 3.6-89, 3.6-90, 3.6-95, 3.6-97, 3.6-98, 3.6-103, 3.6-104, 3.6-109, 3.6-110, 3.6-111, 3.6-113, 3.6-118, 3.6-119, 3.6-120, 3.6-121, 3.6-122, 3.6-124, 3.6-128, 3.6-130, 3.6-131, 3.6-133, 3.6-135, 3.6-136, 3.6-141, 3.6-142, 3.6-143, 3.6-144, 3.6-145, 3.6-147, 3.6-148, 3.6-150, 3.6-151, 3.6-158, 3.6-159, 3.6-164, 3.6-165, 3.6-180, 3.6-181, 3.6-190, 3.6-192, 3.6-193, 3.6-195, 3.6-196, 3.6-198, 3.6-200, 3.6-201, 3.6-203, 3.7-18, 3.7-27, 3.8-52, 3.9-19, 3.9-28, 3.10-4, 3.10-5, 3.10-7, 3.12-9, 3.12-11, 3.12-12, 3.13-6, 3.13-7, 3.13-27, 3.14-2, 3.14-6, 3.14-9, 3.14-10, 3.14-11, 3.14-13, 3.14-15, 3.14-17, 3.14-24, 3.14-25, 3.14-27, 3.14-28, 3.16-23, 4-29, 4-30, 4-33, 4-34, 4-35, 4-36, 4-37, 4-38, 4-39, 4-40, 4-41, 4-42, 4-54, 4-55, 4-56, 4-58, 4-64, 4-66, 4-75, 4-76, 4-83, 4-87, 4-88, 4-89, 4-90, 4-99, 4-107, 4-125, 4-134

Mosquito, ES-28, ES-50, 3.6-197, 3.10-1, 3.10-2, 3.10-3, 3.10-4, 3.10-5, 3.10-6, 3.10-7, 3.10-8, 3.10-9, 3.11-10, 3.11-11, 3.11-13, 4-98, 4-99, 4-100, 4-104

Mountain View, ES-2, ES-40, 1-2, 1-7, 1-30, 3.3-16, 3.3-23, 3.3-24, 3.3-28, 3.3-52, 3.3-58, 3.4-4, 3.6-14, 3.6-31, 3.6-95, 3.6-133, 3.7-3, 3.7-4, 3.7-8, 3.7-21, 3.7-22, 3.7-33, 3.8-1, 3.8-10, 3.8-16, 3.8-46, 3.9-1, 3.9-3, 3.9-8, 3.9-9, 3.9-23, 3.10-3, 3.11-1, 3.11-2, 3.11-4, 3.12-1, 3.12-4, 3.12-19, 3.13-8, 3.13-13, 3.13-25, 3.15-2, 3.15-4, 3.15-5, 3.15-10, 3.16-4, 3.16-10, 3.16-20, 3.17-4, 3.17-8, 4-4, 4-5, 4-18, 4-31, 4-108

Mudflats, ES-25, ES-27, ES-47, ES-49, 1-11, 3.3-2, 3.3-6, 3.3-7, 3.3-14, 3.3-18, 3.3-25, 3.3-47, 3.3-48, 3.3-49, 3.4-67, 3.6-3, 3.6-6, 3.6-7, 3.6-10, 3.6-13, 3.6-20, 3.6-23, 3.6-24, 3.6-31, 3.6-32, 3.6-35, 3.6-43, 3.6-45, 3.6-53, 3.6-55, 3.6-60, 3.6-61, 3.6-62, 3.6-63, 3.6-66, 3.6-67, 3.6-68, 3.6-69, 3.6-70, 3.6-71, 3.6-72, 3.6-73, 3.6-74, 3.6-75, 3.6-84, 3.6-91, 3.6-124, 3.6-126, 3.6-128, 3.6-130, 3.6-133, 3.6-139, 3.6-141, 3.6-146, 3.6-151, 3.6-154, 3.6-155, 3.6-156, 3.6-191, 3.6-195, 3.8-1, 3.8-8, 3.9-1, 3.9-3, 3.16-23, 3.17-1, 3.17-12, 4-55, 4-57, 4-58, 4-59, 4-85, 4-133, 4-134, 4-139, 6-6, 6-7

N

National Marine Fisheries Service (NMFS), 1-36, 3.4-54, 3.4-55, 3.6-46, 3.6-115, 3.6-176, 4-16

National Oceanic and Atmospheric Administration (NOAA), 3.3-2, 3.4-4, 3.4-5, 3.4-51, 3.4-53, 3.6-46, 3.6-50, 3.7-6

Newark, 1-11, 1-13, 1-32, 3.4-14, 3.4-15, 3.4-35, 3.4-38, 3.4-41, 3.6-12, 3.6-14, 3.6-15, 3.6-36, 3.6-39, 3.6-64, 3.6-65, 3.6-77, 3.6-85, 3.6-87, 3.6-88, 3.6-89, 3.6-130, 3.7-21, 3.8-1, 3.8-23, 3.8-26, 3.8-34, 3.8-35, 3.8-47, 3.9-1, 3.9-15, 3.10-3, 3.13-15, 3.15-7, 3.15-8, 3.15-11, 3.16-2, 3.17-8, 3.17-9, 4-15, 4-16

Noise, ES-29, ES-40, ES-41, ES-51, 3.1-2, 3.2-4, 3.2-5, 3.6-114, 3.6-115, 3.6-117, 3.6-119, 3.9-9, 3.9-25, 3.9-29, 3.11-11, 3.11-14, 3.13-1, 3.13-2, 3.13-3, 3.13-4, 3.13-5, 3.13-6, 3.13-7, 3.13-8, 3.13-9, 3.13-10, 3.13-11, 3.13-12, 3.13-13, 3.13-14, 3.13-15, 3.13-16, 3.13-17, 3.13-19, 3.13-21, 3.13-22, 3.13-23, 3.13-24, 3.13-25, 3.13-26, 3.13-27, 3.13-28, 3.13-30, 3.13-31, 3.13-32, 3.13-33, 3.13-34, 3.14-20, 3.14-22, 3.14-24, 3.14-25, 4-21, 4-104, 4-111, 4-112, 4-113, 4-114, 4-115, 4-116, 4-117

P

Pacific Gas & Electric (PG&E), ES-30, ES-52, 1-37, 3.3-30, 3.4-84, 3.8-1, 3.9-8, 3.13-10, 3.14-14, 3.16-1, 3.16-2, 3.16-4, 3.16-8, 3.16-10, 3.16-11, 3.16-12, 3.16-13, 3.16-14, 3.16-15, 3.16-16, 3.16-17, 3.16-18, 3.16-25, 3.16-26, 3.16-27, 3.16-28, 3.16-29, 3.16-30, 3.17-5, 4-1, 4-7, 4-8, 4-17, 4-38, 4-95, 4-111, 4-125, 4-126, 4-127, 4-128

Palo Alto, 1-2, 1-7, 1-25, 1-30, 3.3-11, 3.3-18, 3.3-24, 3.3-25, 3.3-28, 3.4-4, 3.4-6, 3.4-11, 3.4-35, 3.4-37, 3.4-41, 3.4-46, 3.5-9, 3.5-23, 3.6-15, 3.6-32, 3.6-132, 3.6-197, 3.7-4, 3.7-8, 3.7-21, 3.8-1, 3.8-10, 3.8-31, 3.8-47, 3.8-48, 3.9-1, 3.9-3, 3.9-9, 3.9-15, 3.9-26, 3.10-3, 3.11-1, 3.11-6, 3.12-2, 3.12-4, 3.13-9, 3.13-15, 3.13-16, 3.15-6, 3.15-8, 3.15-12, 3.16-1, 3.16-21, 3.17-4, 3.17-9, 3.17-10

Pollutants, ES-30, ES-34, ES-41, ES-52, 3.2-4, 3.4-16, 3.4-29, 3.4-44, 3.4-45, 3.4-46, 3.4-48, 3.4-49, 3.4-51, 3.4-54, 3.4-59, 3.4-60, 3.4-61, 3.4-83, 3.4-84, 3.4-85, 3.4-87, 3.4-100, 3.6-147, 3.9-14, 3.14-1, 3.14-2, 3.14-3, 3.14-5, 3.14-6, 3.14-7, 3.14-8, 3.14-9, 3.14-10, 3.14-11, 3.14-12, 3.14-13, 3.14-14, 3.14-15, 3.14-17, 3.14-18, 3.14-21, 3.14-23, 3.14-24, 3.14-25, 3.14-34, 3.14-35, 3.14-36, 4-3, 4-6, 4-40, 4-41, 4-104, 4-118, 4-119, 4-120, 4-121, 6-5, 6-9, 6-12, 6-13

Public access, ES-1, ES-2, ES-4, ES-17, ES-20, ES-27, ES-49, ES-54, ES-56, ES-57, 1-1, 1-10, 1-24, 1-27, 1-29, 1-32, 1-33, 1-34, 3.2-2, 3.2-3, 3.2-4, 3.2-5, 3.4-82, 3.4-83, 3.4-85, 3.4-88, 3.4-89, 3.4-99, 3.6-47, 3.6-132, 3.6-133, 3.6-135, 3.6-136, 3.6-137, 3.6-192, 3.6-193, 3.7-1, 3.7-7, 3.7-8, 3.7-11, 3.7-17, 3.7-18, 3.7-19, 3.7-20, 3.7-21, 3.7-23, 3.7-25, 3.7-26, 3.7-27, 3.7-28, 3.7-29, 3.7-30, 3.7-31, 3.7-32, 3.7-33, 3.7-34, 3.8-51, 3.8-54, 3.8-58, 3.8-59, 3.9-11, 3.9-12, 3.9-24, 3.9-27, 3.11-10, 3.11-11, 3.11-13, 3.11-14, 3.12-3, 3.12-4, 3.16-13, 3.16-28, 3.16-31, 3.16-32, 3.16-33, 3.16-34, 3.17-13, 3.17-14, 4-83, 4-91, 4-92, 4-101, 4-102, 4-103, 5-1, 5-2, 5-5

Public Services, ES-30, ES-43, ES-52, 3.1-2, 3.9-27, 3.15-1, 3.15-9, 3.15-10, 3.15-11, 3.15-12, 3.15-14, 3.16-8, 3.16-9, 4-100, 4-124, 4-125

R

Recreation Resources, 3.1-2, 3.7-1, 3.7-20, 3.7-23, 3.11-3, 3.12-3, 3.12-4, 3.13-9, 3.13-10, 4-91, 5-5

Redwood City, 1-11, 1-13, 1-30, 3.3-2, 3.3-11, 3.3-36, 3.6-15, 3.6-65, 3.6-85, 3.6-133, 3.7-21, 3.8-10, 3.8-12, 3.8-18, 3.8-48, 3.9-1, 3.9-9, 3.9-26, 3.11-1, 3.11-6, 3.13-9, 3.13-16, 3.14-10, 3.14-12, 3.14-13, 3.15-5, 3.15-6, 3.15-8, 3.15-9, 3.15-12, 3.16-6, 3.17-10, 4-15, 4-16

Regional Water Quality Control Board (RWQCB), ES-32, ES-33, ES-34, 1-5, 1-36, 1-37, 3.4-1, 3.4-2, 3.4-4, 3.4-5, 3.4-6, 3.4-7, 3.4-9, 3.4-10, 3.4-17, 3.4-33, 3.4-34, 3.4-36, 3.4-44, 3.4-45, 3.4-46, 3.4-51, 3.4-53, 3.4-54, 3.4-55, 3.4-57, 3.4-58, 3.4-60, 3.4-84, 3.4-86, 3.4-87, 3.4-88, 3.6-47, 3.6-48, 3.6-50, 3.7-27, 3.9-9, 3.9-10, 3.9-15, 3.16-6, 4-36

S

Salt production, ES-2, 1-11, 1-14, 1-32, 3.3-16, 3.3-18, 3.3-20, 3.3-44, 3.3-59, 3.3-61, 3.6-1, 3.6-3, 3.6-18, 3.6-19, 3.6-47, 3.6-76, 3.7-7, 3.7-8, 3.7-11, 3.7-26, 3.7-30, 3.8-1, 3.9-1, 3.9-12, 3.9-25, 3.11-1, 3.12-3, 3.13-8, 3.17-9, 3.17-11, 3.17-13, 4-75

San Francisco Bay Conservation and Development Commission (BCDC), ES-32, 1-5, 1-36, 1-37, 3.3-40, 3.4-86, 3.6-47, 3.6-50, 3.7-11, 3.7-17, 3.7-19, 3.7-20, 3.7-21, 3.7-23, 3.7-25, 3.7-26, 3.7-27, 3.7-28, 3.9-9, 3.9-11, 3.9-12, 3.9-13, 3.9-15, 3.9-16, 4-18, 4-91

San Francisco Bay Joint Venture (SFBJV), 1-14, 3.7-23, 3.7-25, 3.9-9, 3.9-14, 3.10-4

San Francisco Bay/Sacramento-San Joaquin River Delta (Bay-Delta), 3.4-2, 3.4-25, 3.7-25, 3.9-10, 3.9-12, 3.9-13

San Jose, ES-40, 1-2, 1-7, 1-25, 1-30, 1-35, 3.3-1, 3.3-6, 3.3-23, 3.3-24, 3.3-27, 3.4-1, 3.4-2, 3.4-4, 3.4-7, 3.4-9, 3.4-13, 3.4-14, 3.4-37, 3.4-46, 3.5-5, 3.5-6, 3.5-8, 3.5-9, 3.5-14, 3.5-15, 3.5-17, 3.5-18, 3.5-23, 3.5-28, 3.5-29, 3.6-11, 3.6-15, 3.6-32, 3.6-65, 3.6-85, 3.6-95, 3.6-128, 3.6-146, 3.6-147, 3.7-8, 3.7-14, 3.7-21, 3.7-22, 3.7-24, 3.8-7, 3.8-10, 3.8-11, 3.8-12, 3.8-13, 3.8-16, 3.8-18, 3.8-20, 3.8-22, 3.8-23,

3.8-26, 3.8-32, 3.8-44, 3.9-1, 3.9-3, 3.9-9, 3.9-22, 3.9-23, 3.9-26, 3.11-1, 3.11-2, 3.11-4, 3.11-5, 3.12-1, 3.12-2, 3.12-4, 3.12-16, 3.13-8, 3.13-12, 3.13-24, 3.13-30, 3.14-10, 3.14-12, 3.14-13, 3.15-2, 3.15-3, 3.15-4, 3.15-9, 3.16-4, 3.16-6, 3.16-9, 3.16-21, 3.16-35, 3.17-1, 3.17-7, 4-4, 4-5, 4-16, 4-18, 4-125, 4-136, 5-1

San Mateo County, 1-2, 1-30, 3.2-1, 3.3-2, 3.3-39, 3.3-42, 3.4-5, 3.4-39, 3.4-41, 3.4-102, 3.6-147, 3.6-197, 3.7-23, 3.8-11, 3.8-16, 3.8-18, 3.9-8, 3.9-15, 3.9-27, 3.10-1, 3.10-3, 3.10-4, 3.11-4, 3.12-2, 3.15-6, 4-14

Santa Clara County, ES-17, ES-40, 1-25, 1-27, 1-29, 1-30, 3.2-1, 3.3-11, 3.3-14, 3.3-26, 3.3-39, 3.3-41, 3.4-5, 3.4-40, 3.5-8, 3.6-14, 3.6-15, 3.6-16, 3.6-38, 3.6-49, 3.6-95, 3.6-128, 3.6-147, 3.6-173, 3.7-3, 3.7-7, 3.7-22, 3.7-24, 3.8-1, 3.8-11, 3.8-12, 3.8-16, 3.8-17, 3.8-18, 3.8-45, 3.9-1, 3.9-9, 3.9-14, 3.9-15, 3.9-17, 3.10-3, 3.10-4, 3.11-4, 3.12-2, 3.13-8, 3.13-12, 3.13-13, 3.13-24, 3.14-10, 3.15-2, 3.15-3, 3.15-4, 3.16-4, 3.17-7, 3.17-8, 4-14, 4-16, 4-17

Santa Clara Valley Water District (SCVWD), ES-35, 1-5, 1-7, 1-23, 1-25, 1-27, 1-29, 1-30, 1-32, 1-34, 1-35, 3.3-1, 3.3-11, 3.3-26, 3.3-27, 3.3-28, 3.3-30, 3.3-32, 3.3-33, 3.3-39, 3.3-41, 3.3-42, 3.3-67, 3.4-1, 3.4-4, 3.4-5, 3.4-10, 3.4-11, 3.4-12, 3.4-17, 3.4-24, 3.4-34, 3.4-35, 3.4-36, 3.4-37, 3.4-39, 3.4-40, 3.4-41, 3.4-43, 3.4-45, 3.4-46, 3.4-84, 3.4-90, 3.5-1, 3.6-49, 3.6-50, 3.6-197, 4-14, 4-16

Sediment quality, ES-24, ES-34, ES-46, 1-10, 1-38, 3.4-1, 3.4-4, 3.4-7, 3.4-8, 3.4-9, 3.4-10, 3.4-11, 3.4-12, 3.4-13, 3.4-14, 3.4-16, 3.4-17, 3.4-18, 3.4-24, 3.4-26, 3.4-29, 3.4-44, 3.4-53, 3.4-54, 3.4-55, 3.4-60, 3.4-71, 3.4-75, 3.4-82, 3.4-87, 3.4-95, 3.4-99, 3.4-100, 3.9-13, 4-36

Sediments, ES-23, ES-24, ES-32, ES-33, ES-34, ES-45, ES-46, ES-54, ES-56, 1-10, 1-25, 1-33, 1-35, 1-36, 1-38, 3.1-1, 3.2-2, 3.2-3, 3.3-1, 3.3-2, 3.3-5, 3.3-6, 3.3-8, 3.3-9, 3.3-14, 3.3-16, 3.3-17, 3.3-18, 3.3-19, 3.3-24, 3.3-25, 3.3-27, 3.3-28, 3.3-30, 3.3-35, 3.3-36, 3.3-38, 3.3-39, 3.3-46, 3.3-50, 3.3-71, 3.3-72, 3.3-73, 3.4-1, 3.4-2, 3.4-4, 3.4-5, 3.4-7, 3.4-8, 3.4-9, 3.4-10, 3.4-11, 3.4-12, 3.4-13, 3.4-14, 3.4-15, 3.4-16, 3.4-17, 3.4-18, 3.4-21, 3.4-22, 3.4-23, 3.4-24, 3.4-25, 3.4-26, 3.4-29, 3.4-30, 3.4-32, 3.4-33, 3.4-44, 3.4-47, 3.4-48, 3.4-49, 3.4-51, 3.4-52, 3.4-53, 3.4-54, 3.4-55, 3.4-56, 3.4-59, 3.4-60, 3.4-61, 3.4-62, 3.4-63, 3.4-64, 3.4-65, 3.4-66, 3.4-67, 3.4-68, 3.4-69, 3.4-70, 3.4-71, 3.4-72, 3.4-73, 3.4-74, 3.4-75, 3.4-76, 3.4-77, 3.4-78, 3.4-79, 3.4-80, 3.4-82, 3.4-83, 3.4-84, 3.4-85, 3.4-86, 3.4-87, 3.4-88, 3.4-89, 3.4-92, 3.4-95, 3.4-96, 3.4-97, 3.4-98, 3.4-99, 3.4-100, 3.5-3, 3.5-5, 3.5-16, 3.5-17, 3.5-19, 3.6-6, 3.6-8, 3.6-11, 3.6-20, 3.6-33, 3.6-48, 3.6-53, 3.6-61, 3.6-70, 3.6-72, 3.6-118, 3.6-155, 3.6-156, 3.8-3, 3.8-4, 3.8-48, 3.9-13, 3.9-15, 3.12-10, 3.14-30, 3.14-38, 3.16-20, 3.16-22, 3.16-23, 3.16-26, 4-24, 4-32, 4-33, 4-34, 4-35, 4-36, 4-37, 4-38, 4-39, 4-40, 4-41, 4-42, 4-43, 4-45, 4-54, 4-88, 4-90, 4-131, 4-132, 4-133, 6-7, 6-10

Seismicity, see Section 3.5, Geology, Soils and Seismicity.

SFEI, 3.4-1, 3.4-2, 3.4-4, 3.4-6, 3.4-7, 3.4-8, 3.4-9, 3.4-10, 3.4-11, 3.4-13, 3.4-15, 3.4-52, 3.4-53

Shoreline Study, ES-1, ES-3, ES-17, 1-1, 1-4, 1-6, 1-25, 1-26, 1-27, 1-28, 1-29, 1-30, 1-31, 1-32, 1-33, 1-34, 1-35, 1-36, 3.1-1, 3.1-2, 3.2-1, 3.2-2, 3.2-3, 3.2-4, 3.3-16, 3.3-26, 3.3-27, 3.3-38, 3.3-46, 3.6-1, 3.6-35, 3.6-138, 3.7-4, 3.8-1, 3.8-2, 3.8-3, 3.8-30, 3.8-31, 3.8-32, 3.9-24, 3.13-7, 3.13-10, 4-1, 4-8, 4-22, 4-24, 4-27, 4-29, 4-32, 4-37, 4-38, 4-39, 4-43, 4-95, 4-100, 4-108, 4-111, 4-114, 4-134, 4-135, 4-136, 4-137, 4-139

Shrimp, ES-27, ES-49, 3.4-29, 3.6-6, 3.6-10, 3.6-11, 3.6-20, 3.6-21, 3.6-23, 3.6-60, 3.6-93, 3.6-148, 3.6-149, 3.6-150, 3.6-151, 3.6-201, 3.6-202, 3.6-203, 3.7-18, 3.11-1, 3.11-2, 3.11-3, 3.11-7, 3.11-8, 3.11-9, 3.11-12, 3.14-10, 3.14-29, 3.17-1, 4-89, 4-90, 4-100, 4-101, 4-102, 6-1, 6-3, 6-10

Socioeconomics, ES-28, ES-39, ES-50, 3.1-2, 3.2-4, 3.2-5, 3.11-1, 3.11-2, 3.11-5, 4-100, 4-101, 4-104, 5-2, 5-4
Soil liquefaction, ES-24, ES-46, 3.5-8, 3.5-9, 3.5-11, 3.5-13, 3.5-14, 3.5-15, 3.5-16, 3.5-19, 3.5-20, 3.5-21, 3.5-26, 3.5-27, 4-47, 4-48, 6-1, 6-7, 6-10, 6-11
Soils, see Section 3.5, Geology, Soils and Seismicity.
Stormwater pollution prevention plan (SWPPP), ES-32, 1-37, 3.4-86, 3.6-48
Sunnyvale, ES-40, 1-2, 1-7, 1-30, 3.3-11, 3.3-24, 3.3-26, 3.3-27, 3.3-28, 3.3-55, 3.4-4, 3.4-46, 3.5-18, 3.6-14, 3.6-15, 3.6-33, 3.6-37, 3.6-95, 3.6-128, 3.6-138, 3.6-193, 3.7-3, 3.7-4, 3.7-8, 3.7-21, 3.7-22, 3.7-33, 3.8-10, 3.8-16, 3.8-26, 3.8-37, 3.8-46, 3.9-1, 3.9-3, 3.9-9, 3.9-23, 3.10-3, 3.11-1, 3.11-2, 3.11-4, 3.11-5, 3.11-6, 3.12-1, 3.12-2, 3.12-4, 3.13-8, 3.13-12, 3.13-24, 3.15-2, 3.15-4, 3.15-5, 3.15-10, 3.16-4, 3.16-6, 3.16-10, 3.16-21, 3.16-34, 3.16-35, 3.17-4, 3.17-7, 4-4, 4-5, 4-15, 4-18, 4-108, 4-132, 4-133

T

Total dissolved solids (TDS), 3.4-37, 3.4-38, 3.4-48, 3.4-61
Total maximum daily load (TMDL), ES-24, ES-46, 3.4-1, 3.4-17, 3.4-25, 3.4-53, 3.4-54, 3.4-59, 3.4-60, 3.4-71, 3.4-72, 3.4-73, 3.4-74, 3.4-75, 3.4-95, 3.4-96, 4-3, 4-36, 4-37, 4-41
Traffic, ES-29, ES-39, ES-41, ES-42, ES-51, 3.1-2, 3.2-4, 3.2-5, 3.3-76, 3.8-29, 3.9-25, 3.9-29, 3.11-11, 3.11-14, 3.12-1, 3.12-2, 3.12-3, 3.12-2, 3.12-4, 3.12-5, 3.12-6, 3.12-7, 3.12-8, 3.12-9, 3.12-10, 3.12-11, 3.12-12, 3.12-13, 3.12-14, 3.12-15, 3.12-16, 3.12-17, 3.12-18, 3.12-19, 3.12-20, 3.13-4, 3.13-5, 3.13-6, 3.13-7, 3.13-8, 3.13-9, 3.13-10, 3.13-19, 3.13-25, 3.13-26, 3.13-27, 3.13-31, 3.13-32, 3.13-33, 3.14-19, 3.14-22, 3.14-23, 3.14-24, 3.14-25, 3.15-2, 3.15-4, 3.15-6, 3.15-8, 4-19, 4-21, 4-104, 4-105, 4-106, 4-107, 4-108, 4-109, 4-110, 4-111, 4-113, 4-114, 4-115, 4-120
Tsunami, ES-24, ES-46, 3.3-10, 3.5-9, 3.5-10, 3.5-16, 3.5-17, 3.5-21, 3.5-22, 3.5-28, 4-48, 4-49, 6-13
Turbidity, 3.4-4, 3.4-47, 3.4-62, 3.4-63, 3.4-64, 3.4-66, 3.4-82, 3.4-83, 3.4-88, 3.4-92, 3.4-93, 3.4-99, 4-32, 6-13

U

U.S. Army Corps of Engineers (Corps), ES-17, 1-5, 1-7, 1-23, 1-25, 1-27, 1-29, 1-30, 1-32, 1-33, 1-36, 3.1-1, 3.2-1, 3.2-2, 3.2-3, 3.3-1, 3.3-2, 3.3-10, 3.3-11, 3.3-16, 3.3-17, 3.3-18, 3.3-19, 3.3-27, 3.3-36, 3.3-38, 3.3-39, 3.3-40, 3.3-44, 3.3-45, 3.3-46, 3.3-53, 3.4-45, 3.6-45, 3.6-50, 3.7-27, 3.8-29, 3.9-15, 4-1, 4-95, 5-2, 5-4, 5-5, 6-6
U.S. Environmental Protection Agency (USEPA), ES-33, 1-6, 1-8, 3.3-39, 3.4-1, 3.4-6, 3.4-44, 3.4-50, 3.4-51, 3.4-54, 3.4-55, 3.4-86, 3.6-48, 3.9-15, 3.13-16, 3.14-4, 3.14-5, 3.14-6, 3.14-8, 3.14-14, 3.14-15, 3.14-16, 3.14-17, 3.14-18, 3.14-26, 4-3, 4-7, 4-121, 6-6
U.S. Fish and Wildlife Service (USFWS), ES-1, ES-2, ES-17, ES-35, ES-39, ES-42, ES-42, ES-43, ES-54, 1-1, 1-2, 1-5, 1-7, 1-8, 1-14, 1-23, 1-27, 1-29, 1-30, 1-34, 1-36, 3.3-23, 3.3-28, 3.3-32, 3.3-33, 3.3-35, 3.3-57, 3.4-1, 3.4-17, 3.4-18, 3.4-21, 3.4-26, 3.4-28, 3.4-37, 3.4-54, 3.4-55, 3.4-90, 3.6-1, 3.6-46, 3.6-48, 3.6-50, 3.6-51, 3.6-94, 3.6-103, 3.6-110, 3.6-115, 3.6-117, 3.6-119, 3.6-124, 3.6-132, 3.6-148, 3.6-179, 3.6-181, 3.6-200, 3.6-201, 3.7-1, 3.7-2, 3.7-3, 3.7-4, 3.7-5, 3.7-6, 3.7-7, 3.7-8, 3.7-11, 3.7-13, 3.7-14, 3.7-15, 3.7-17, 3.7-18, 3.7-19, 3.7-21, 3.7-25, 3.7-27, 3.7-28, 3.8-38, 3.9-1, 3.9-9, 3.9-14, 3.9-15, 3.11-2, 3.11-7, 3.11-8, 3.11-9, 3.11-12, 3.11-13, 3.12-4, 3.12-10, 3.12-14,

3.12-15, 3.14-10, 3.14-24, 3.14-27, 3.14-28, 3.16-11, 3.16-14, 3.16-15, 3.16-16, 3.16-27, 3.16-28, 3.16-29, 4-1, 4-16, 4-17, 4-30, 4-88, 4-89, 4-100, 4-126, 4-127, 5-2, 5-3, 5-4, 5-5, 6-3, 6-11
U.S. Geological Survey (USGS), 3.3-1, 3.3-2, 3.3-6, 3.3-8, 3.3-17, 3.3-24, 3.3-35, 3.3-46, 3.4-1, 3.4-2, 3.4-4, 3.4-5, 3.4-6, 3.4-13, 3.4-15, 3.4-17, 3.4-18, 3.4-24, 3.4-25, 3.4-26, 3.4-28, 3.4-29, 3.4-38, 3.4-41, 3.4-54, 3.4-63, 3.4-64, 3.5-21, 3.6-1, 3.6-24, 3.6-28, 3.6-31, 3.6-34, 3.6-35, 3.6-53, 3.6-65, 3.6-94, 3.6-95, 3.6-96, 3.6-97, 3.6-101, 3.6-106, 3.6-123, 3.6-124, 3.6-127, 3.6-161, 3.6-164, 3.6-165, 3.6-166, 3.6-167, 3.6-168, 3.6-169, 3.6-170, 3.6-171, 3.6-173, 3.8-1, 3.8-22, 3.8-31, 3.8-32, 3.8-34, 3.8-35, 3.8-36
Union City, 1-2, 3.3-11, 3.3-19, 3.7-10, 3.7-21, 3.7-22, 3.7-24, 3.8-12, 3.8-13, 3.8-16, 3.8-47, 3.9-1, 3.9-3, 3.9-9, 3.9-24, 3.9-25, 3.10-3, 3.11-1, 3.12-2, 3.12-8, 3.12-16, 3.13-8, 3.13-14, 3.13-15, 3.14-11, 3.15-1, 3.15-2, 3.15-7, 3.15-11, 3.16-2, 3.16-9, 3.17-8, 4-4, 4-5, 4-8, 4-15, 4-17, 5-1
Utilities, ES-30, ES-44, ES-52, 3.1-2, 3.2-4, 3.2-5, 3.4-36, 3.5-24, 3.12-6, 3.13-11, 3.14-4, 3.15-1, 3.15-9, 3.16-1, 3.16-2, 3.16-8, 3.16-9, 3.16-10, 4-6, 4-16, 4-19, 4-52, 4-53, 4-104, 4-125, 4-127

V

Vector Management, ES-28, ES-39, ES-50, 1-10, 3.1-2, 3.10-1, 3.10-4, 3.10-5, 3.10-7, 3.10-8, 3.11-10, 3.11-11, 3.11-13, 4-98, 4-99
Vegetation, see Biological Resources, Vegetation.
Visual Resources, 3.1-2, 3.17-1, 3.17-4, 3.17-6, 3.17-8, 3.17-9, 3.17-10, 3.17-11, 4-137, 4-138

W

Water quality, ES-23, ES-24, ES-32, ES-33, ES-45, ES-46, ES-56, 1-18, 1-36, 3.3-1, 3.3-7, 3.3-24, 3.3-40, 3.3-41, 3.4-1, 3.4-2, 3.4-5, 3.4-6, 3.4-7, 3.4-8, 3.4-9, 3.4-10, 3.4-11, 3.4-13, 3.4-14, 3.4-16, 3.4-26, 3.4-27, 3.4-29, 3.4-38, 3.4-39, 3.4-41, 3.4-42, 3.4-44, 3.4-45, 3.4-46, 3.4-47, 3.4-48, 3.4-49, 3.4-50, 3.4-51, 3.4-53, 3.4-54, 3.4-55, 3.4-56, 3.4-57, 3.4-58, 3.4-59, 3.4-60, 3.4-61, 3.4-64, 3.4-66, 3.4-67, 3.4-69, 3.4-71, 3.4-72, 3.4-73, 3.4-74, 3.4-75, 3.4-76, 3.4-77, 3.4-81, 3.4-82, 3.4-83, 3.4-84, 3.4-86, 3.4-87, 3.4-91, 3.4-95, 3.4-97, 3.4-99, 3.6-47, 3.6-48, 3.6-50, 3.6-122, 3.6-124, 3.6-147, 3.6-149, 3.6-150, 3.6-183, 3.6-184, 3.6-185, 3.6-191, 3.6-201, 3.6-202, 3.7-27, 3.9-10, 3.9-11, 3.9-13, 3.10-3, 3.11-3, 3.16-1, 3.16-21, 4-3, 4-7, 4-14, 4-32, 4-36, 4-37, 4-38, 4-40, 4-78, 4-89, 4-90, 6-12
Water Quality Control Plan, San Francisco Bay Region (Basin Plan), 3.4-2, 3.4-44, 3.4-46, 3.4-47, 3.4-48, 3.4-49, 3.4-50, 3.4-51, 3.4-54, 3.4-57, 3.4-58, 3.4-61, 3.4-74, 3.6-47, 3.6-48, 3.9-9, 3.9-10
Wetlands, ES-1, 1-10, 1-18, 1-23, 1-34, 1-35, 3.3-18, 3.3-27, 3.3-32, 3.3-39, 3.3-41, 3.4-4, 3.4-5, 3.4-17, 3.4-45, 3.4-46, 3.4-53, 3.4-57, 3.4-61, 3.4-62, 3.4-69, 3.4-76, 3.4-77, 3.6-1, 3.6-3, 3.6-5, 3.6-6, 3.6-7, 3.6-11, 3.6-12, 3.6-15, 3.6-37, 3.6-38, 3.6-39, 3.6-45, 3.6-48, 3.6-51, 3.6-63, 3.6-69, 3.6-80, 3.6-90, 3.6-94, 3.6-98, 3.6-99, 3.6-100, 3.6-122, 3.6-124, 3.6-127, 3.6-128, 3.6-129, 3.6-139, 3.6-140, 3.6-142, 3.6-145, 3.6-147, 3.6-150, 3.6-186, 3.6-188, 3.7-3, 3.7-6, 3.7-7, 3.7-8, 3.7-11, 3.7-21, 3.7-23, 3.7-26, 3.7-27, 3.9-9, 3.9-10, 3.9-13, 3.9-14, 3.9-16, 3.9-17, 3.9-18, 3.9-19, 3.9-20, 3.9-21, 3.9-23, 3.9-24, 3.9-26, 3.10-1, 3.10-3, 3.10-5, 3.10-6, 3.10-8, 3.12-6, 3.13-22, 3.17-2, 3.17-6, 3.17-9, 3.17-15, 3.17-17, 4-7, 4-8, 4-10, 4-11, 4-20, 4-22, 4-23, 4-24, 4-25, 4-26, 4-27, 4-28, 4-29, 4-30, 4-32, 4-39, 4-41, 4-54, 4-57, 4-58, 4-59, 4-62, 4-64, 4-66, 4-78, 4-79, 4-80, 4-88, 4-89, 4-125, 4-126, 4-127, 4-128, 4-129, 4-139, 4-140, 5-4, 6-2, 6-6, 6-7, 6-8, 6-10, 6-12
Wildlife, see Biological Resources, Wildlife.