

3.16 Utilities

3.16.1 Physical Setting

Methodology

This section presents information on utility services and facilities located within the Project Area. Utilities include gas, electricity, water, and wastewater. Background information was drawn from applicable regional and local general plans and policies as well as from utility representatives.

Regional Setting

In the South Bay Area, gas and electricity are provided to all cities except the cities of Palo Alto and Santa Clara by PG&E. PG&E owns and maintains a network of overhead transmission lines, power distribution lines and substations. Utilities are provided by the cities of Palo Alto and Santa Clara to their respective residents primarily through PG&E's network of transmission lines. The cities of Palo Alto and Santa Clara own and operate small networks of transmission lines, distribution lines and receiving stations; however, they are all located landward of the Project Area.

PG&E overhead power transmission lines traverse through all three pond complexes. In some places, power distribution lines that service pumps, storm water lift stations, and more localized areas separate from the power transmission lines. Ground towers which provide access to overhead transmission and distribution lines are located at intervals along the lines and require water or land based vehicular access via levees for routine inspections, repairs and emergency maintenance. Several PG&E access points for reconductoring of transmission lines are located in the Alviso pond complex and one is within the Ravenswood pond complex. Infrastructure associated with the cities of Palo Alto and Santa Clara municipal utilities is not located within the SBSP Restoration Project Area.

Water and wastewater utilities are provided on both citywide and regional levels. The facilities and infrastructure supporting the services are maintained by the service providers. Water and wastewater infrastructure includes water and wastewater pipelines, wastewater treatment plants and discharge facilities, and storm drainage facilities. Water and wastewater pipelines are generally located within city streets. However, in some circumstances, wastewater force mains may traverse the SBSP Restoration Project Area. In the lower reaches of the watersheds, runoff from developed areas is carried through pipes and discharged to tidal sloughs or channels by gravity-driven flow or lift stations. Storm water discharged by lift stations are relatively unaffected by slight variations in tide. An extensive inventory of storm water facilities is provided in previous Project reports (Moffatt & Nichol Engineers 2005). Presently, not all storm outfalls to the restoration area have been located in the field. Data such as pipe invert information and system capacity have not been determined.

Two other utilities are located near the SBSP Restoration Project Area. The Hetch Hetchy Aqueduct, which conveys a significant portion of the Bay Area's water supply from the Sierra Nevada runs from east to west just south of SR 84 and the Dumbarton Bridge. Additionally, the Regional Water Quality Control Plant in Palo Alto is located adjacent to and discharges to the far South Bay between the Alviso and Ravenswood pond complexes.

The National Geodetic Survey (NGS) maintains a database of geodetic control monuments as part of the National Spatial Reference System. Within California, 18,000 horizontal stations and 50,000 benchmarks were established by NGS (D’Onofrio and others 2003). However, in recent years, the direction of NGS has changed from maintaining a relatively dense control network to maintaining a basic framework system with high-accuracy stations at a spacing of one degree by one degree (46.6 mi to 77.7 mi, or 75 km to 125 km) (D’Onofrio and others 2003; National Ocean and Atmospheric Administration 2007). This system is known as the Continuously Operating Reference System (CORS) and is maintained by satellite at a frequency of 30 seconds or less. No CORS stations are located within or adjacent to the SBSP Restoration Project Area. The CORS station closest to the Eden Landing and Alviso pond complexes is located in the City of Newark, north of SR 84 and east of Ponds N8 and N9 (PID DH9021, CORS P222). The CORS station closest to the Ravenswood pond complex is located in the City of Burlingame. Additional geodetic control, beyond the CORS network, is established and maintained either through cooperative agreement with NGS or by independent, local agencies such as Alameda County, SCVWD, and Caltrans.

The NGS database includes information for each monument, such as the monuments horizontal and vertical location, the date placed, the last date the monument was located and resurveyed, and any anecdotal information necessary to locate the monument. If a monument was not located on the most recent survey attempt, the monument is labeled as “Mark Not Found” in the NGS database. All historical monuments within and adjacent to the Project Area within the NGS database were reviewed.

Agencies responsible for and the specific locations of the utility infrastructure located within each SBSP Restoration Project pond complex are discussed below.

Project Setting

Eden Landing

The Eden Landing pond complex is located in both the City of Hayward and Union City, in Alameda County. Existing infrastructure within the Eden Landing pond complex is shown in Figure 3.16-1.











Gas and Electricity. A PG&E overhead power transmission line enters the northeast corner of the Eden Landing pond complex and extends southeast over the Eden Landing Ecological Reserve Restoration Project tidal restoration site and Pond E6A. After crossing the Bay parallel to the San Mateo Bridge, another PG&E overhead transmission line crosses Pond E10 and E11 before continuing east. There are no PG&E access points for reconductoring within the pond complex.

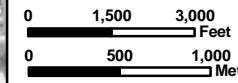
Water and Wastewater. Water services are provided to the City of Hayward by the City of Hayward Utilities Division (City of Hayward 2004) and to Union City, Fremont, and Newark by the ACWD. Wastewater services are provided to the City of Hayward by the City of Hayward Utilities Division and to Union City, Fremont and Newark by the Union Sanitary District. The East Bay Dischargers Authority (EBDA), a joint powers agency, manages wastewater disposal for the City of San Leandro, Oro Loma Sanitary District, Castro Valley Sanitary District, City of Hayward and Union Sanitary District.

South Bay Salt Pond
Restoration Project

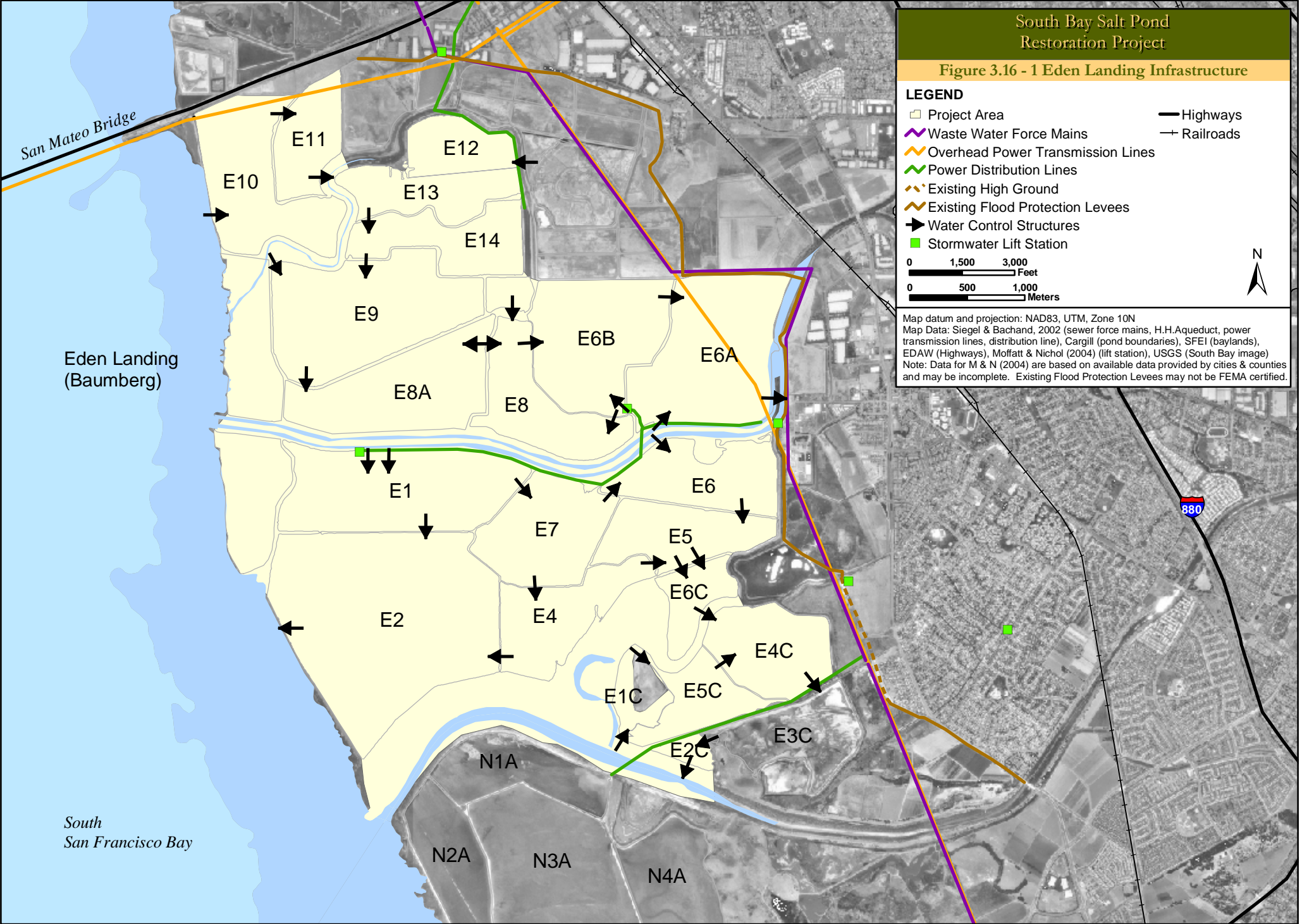
Figure 3.16 - 1 Eden Landing Infrastructure

LEGEND

-  Project Area
-  Waste Water Force Mains
-  Overhead Power Transmission Lines
-  Power Distribution Lines
-  Existing High Ground
-  Existing Flood Protection Levees
-  Water Control Structures
-  Stormwater Lift Station
-  Highways
-  Railroads



Map datum and projection: NAD83, UTM, Zone 10N
 Map Data: Siegel & Bachand, 2002 (sewer force mains, H.H.Aqueduct, power transmission lines, distribution line), Cargill (pond boundaries), SFEI (baylands), EDAW (Highways), Moffatt & Nichol (2004) (lift station), USGS (South Bay image)
 Note: Data for M & N (2004) are based on available data provided by cities & counties and may be incomplete. Existing Flood Protection Levees may not be FEMA certified.



Eden Landing
(Baumberg)

South
San Francisco Bay

A pipeline serving as part of the EBDA effluent disposal system traverses the Eden Landing pond complex as it transports effluent from the Union Sanitary District north towards the EBDA Bay outfall. This wastewater force main enters the pond complex from the southeast and runs northwest along the eastern perimeter and through Pond E6A and into the Eden Landing Ecological Reserve tidal restoration site. Additionally, there are three storm water lift stations located at the ends of spurs of the power distribution line along OAC.

Storm water outfalls discharging via gravity flow in the Eden Landing pond complex drain to OAC and AC FCC.

Geodetic Control Monuments. The majority of NGS geodetic control monuments within the Eden Landing pond complex were last located and surveyed in 1977. It is unknown whether any of these monuments still exist, particularly along Old Alameda Creek and adjacent to Whale's Tail Marsh. One NGS monument in the vicinity of the Eden Landing pond complex was located and resurveyed in 2002 (PID HT2353) near the intersection of Hesperian Boulevard and Old Alameda Creek. This monument is outside of the Project Area and would not be affected by the Project. Additional geodetic control is maintained by Alameda County and the East Bay Regional Parks District.

Alviso

The Alviso pond complex is located bayward of the cities of Fremont, San Jose, Sunnyvale and unincorporated Santa Clara County. A small portion of the pond complex is located within northern Mountain View. Figure 3.16-2 shows the existing infrastructure within the Alviso pond complex.

Gas and Electricity. PG&E overhead transmission lines traverse through the Alviso pond complex in several areas. The main line splits into two just northwest of Ponds A22 and A23. One line enters Pond A6 from the northeast and the other forms a semi-circle around the Project perimeter, crossing over Ponds A22, A23 and A18 as it extends south. It then continues westerly and reenters the Project Area north across Pond A3W to reconvene with the first transmission line at Pond A3N. From here, the transmission lines extend westward through Ponds AB2, AB1 and A2W and then exit the pond complex at Pond A1.


Power distribution lines break off of the main transmission lines in numerous locations to service pumps. These distribution lines extend southward from the main transmission line near Ponds A22 and A23 and cross Mud Slough, a muted tidal marsh along the Union Pacific Railroad track, Coyote Creek, and Triangle Marsh before entering Ponds A15, A14 and A19. Another distribution line extends northward from the main transmission line near Pond A8S along the internal levee between Ponds A8, A5 and A7. PG&E has seven reconductoring access points located on levees or immediately adjacent to ponds within the Alviso pond complex. There are three on the levees of Pond A2W, two on the levees of Pond A3N, one immediately north of Pond A22, and one immediately east of Pond A23.

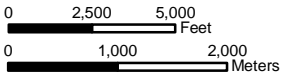
Water and Wastewater. There are no water or wastewater pipelines running through the Alviso pond complex. Several storm water lift stations are located just outside the Alviso pond complex but discharge to tidal sloughs and channels in the SBSP Restoration Project Area.

South Bay Salt Pond Restoration Project

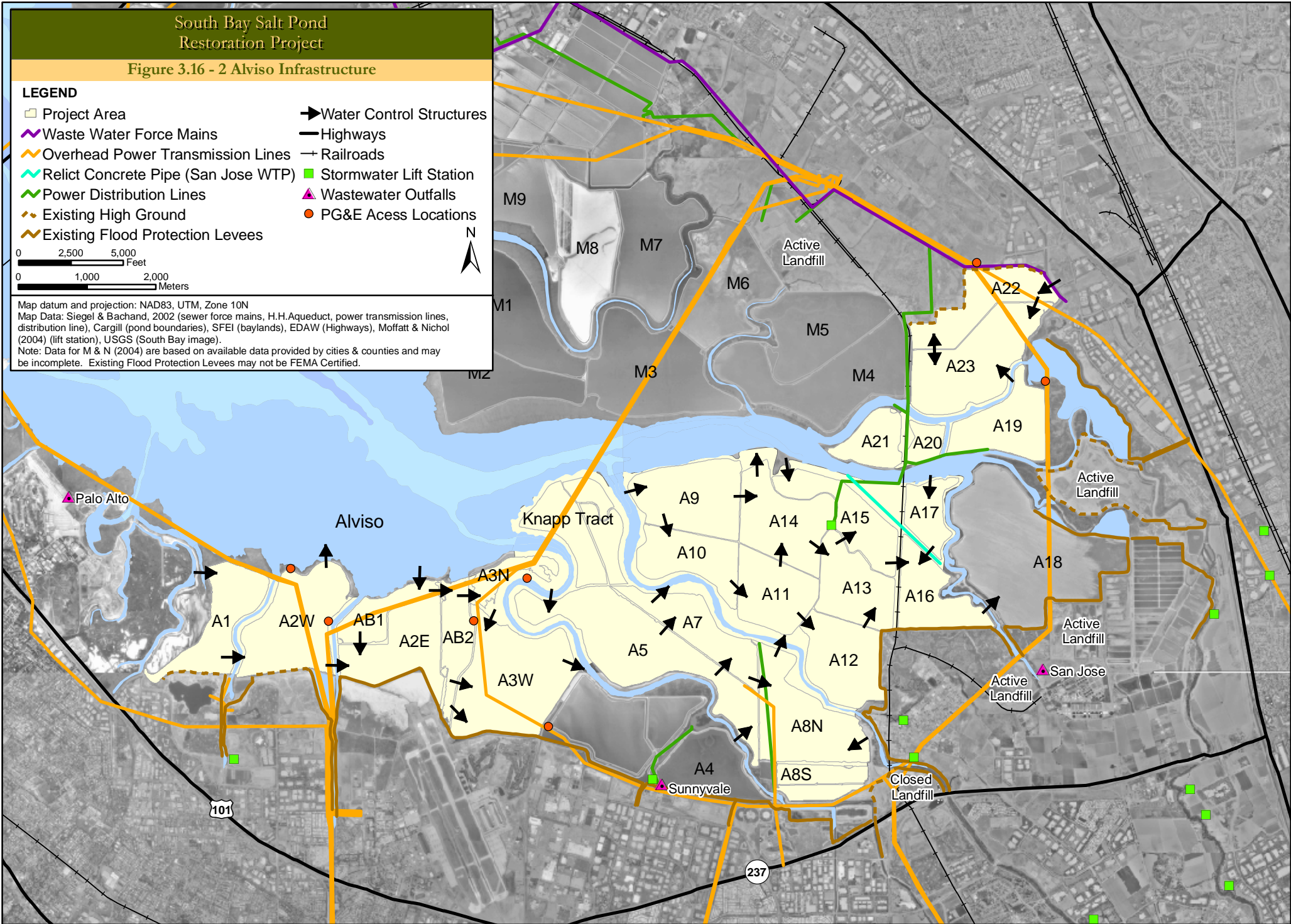
Figure 3.16 - 2 Alviso Infrastructure

LEGEND

-  Project Area
-  Waste Water Force Mains
-  Overhead Power Transmission Lines
-  Relict Concrete Pipe (San Jose WTP)
-  Power Distribution Lines
-  Existing High Ground
-  Existing Flood Protection Levees
-  Water Control Structures
-  Highways
-  Railroads
-  Stormwater Lift Station
-  Wastewater Outfalls
-  PG&E Access Locations



Map datum and projection: NAD83, UTM, Zone 10N
 Map Data: Siegel & Bachand, 2002 (sewer force mains, H.H. Aqueduct, power transmission lines, distribution line), Cargill (pond boundaries), SFEI (baylands), EDAW (Highways), Moffatt & Nichol (2004) (lift station), USGS (South Bay image).
 Note: Data for M & N (2004) are based on available data provided by cities & counties and may be incomplete. Existing Flood Protection Levees may not be FEMA Certified.



Two South Bay wastewater treatment plants are adjacent to the Alviso pond complex and discharge to sloughs within the pond complex. The San Jose/Santa Clara Water Pollution Control Plant (WPCP) is located between Artesian Slough and Coyote Creek just outside of the Alviso pond complex. It is operated by the City of San Jose Environmental Services Department and provides treatment services to the cities of San Jose, Santa Clara, Milpitas, Campbell, Cupertino, Los Gatos, Saratoga, and Monte Sereno. Treated effluent from the WPCP is discharged to Artesian Slough. Average daily discharge flow is approximately 110 MGD (RWQCB 2005). Discharge from the San Jose/Santa Clara WPCP outfall flows into the outfall channel located at the upstream end of Artesian Slough. At the downstream end of the outfall channel, discharge flows over a weir and into Artesian Slough. The Sunnyvale WPCP is located just south of the Alviso pond complex and discharges approximately 14 to 15 MGD into Moffett Channel which connects to Guadalupe Slough (PWA and others 2005).

In the Alviso pond complex, storm drain outfalls are known to exist on Coyote Creek, Guadalupe River / Alviso Slough, Sunnyvale East and West Channels, Moffett Channel, Calabazas Creek, Permanente Creek, Stevens Creek, and Penitencia Creek (Moffatt & Nichol Engineers 2005). Numerous outfalls are located at various inverts along these channels.

Geodetic Control Monuments. Although many NGS historical control monuments are located within the Alviso pond complex, most have not been located or resurveyed since the 1960s and 1970s. Several monuments are located on the PG&E towers in Ponds A1, A2W, AB1, AB2, A3N and A6. These monuments were last located and resurveyed in 1958. A few monuments are also located along the pond levees (*i.e.*, at the intersection of Ponds A5, A6 and A7, and A5, A7 and A8). These monuments were last located and resurveyed in 1967. Some monuments identified along the Union Pacific Railroad right-of-way were noted as “Mark not Found” in the NGS database and others were last located and surveyed in the 1960s to 1980s.

Monuments located within the vicinity of the Alviso pond complex that were located and resurveyed within the past decade include: HT1273 located near the Palo Alto Yacht Harbor (2005); HT1260 near the intersection of Highway 101 and Adobe Creek/Charleston Slough (2005); DG6881 near the southeast corner of Pond A3W (2002); HS3003 near the southeast corner of Pond A4 on Guadalupe Slough (2005); HS4389 near the northwest corner of Pond A22 where the Union Pacific Railroad crosses Thornton Avenue (2002); HS4392 between the Mission Boulevard Interstate 880 off ramp and Kato Road north of Pond A22; and HT2394 on the outboard levee of Pond M26 adjacent to Mowry Slough. The SCVWD also maintains a geodetic control network in Santa Clara County. SCVWD benchmarks are located on the levees adjacent to Alviso Slough within the Project Area and on the levees adjacent to Stevens Creek immediately upstream of the Project Area. The majority of SCVWD benchmarks are located to the south of Highway 101 and SR 237, and to the east of Interstate 880.

Ravenswood

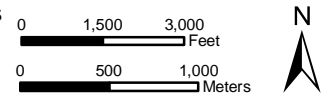
The Ravenswood pond complex is located on the south side of the Bay, adjacent to the Dumbarton Bridge. It is contained within the City of Menlo Park, but is bordered to the northwest and southeast by the cities of Redwood City and East Palo Alto. The existing infrastructure in the Ravenswood pond complex is shown in Figure 3.16-3.

South Bay Salt Pond
Restoration Project

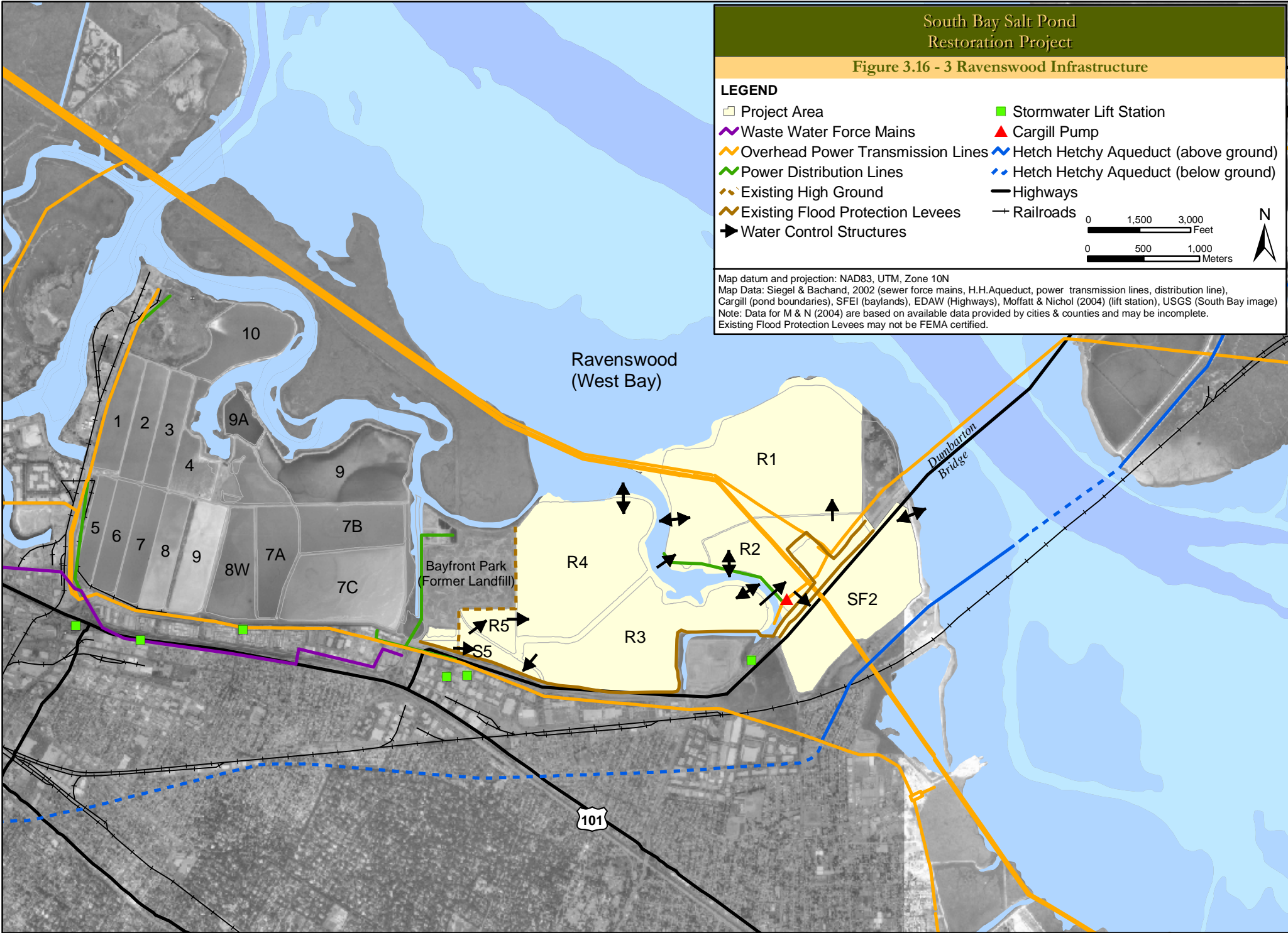
Figure 3.16 - 3 Ravenswood Infrastructure

LEGEND

- Project Area
- Waste Water Force Mains
- Overhead Power Transmission Lines
- Power Distribution Lines
- Existing High Ground
- Existing Flood Protection Levees
- Water Control Structures
- Stormwater Lift Station
- Cargill Pump
- Hetch Hetchy Aqueduct (above ground)
- Hetch Hetchy Aqueduct (below ground)
- Highways
- Railroads



Map datum and projection: NAD83, UTM, Zone 10N
 Map Data: Siegel & Bachand, 2002 (sewer force mains, H.H.Aqueduct, power transmission lines, distribution line),
 Cargill (pond boundaries), SFEI (baylands), EDAW (Highways), Moffatt & Nichol (2004) (lift station), USGS (South Bay image)
 Note: Data for M & N (2004) are based on available data provided by cities & counties and may be incomplete.
 Existing Flood Protection Levees may not be FEMA certified.



Gas and Electricity. A PG&E substation is located between Pond R2 and SR 84. PG&E overhead transmission lines enter the Ravenswood pond complex from the northwest, east and south, crossing through Ponds R1, R2 and SF2. A power distribution line breaks off from the transmission line over Pond R2 and extends northwestward along the eastern bank of Ravenswood Slough.

Water and Wastewater. No water or wastewater facilities are located within the Ravenswood pond complex. Immediately south of Pond SF2, however, is the Hetch Hetchy Aqueduct, which carries water from the Sierra Nevada to the City of San Francisco and other communities on the Peninsula and the South Bay area. The buried section of the aqueduct enters the Bay on the eastern shore and emerges on the western shore at the end of a trestle where it continues above ground to approximately 2,700 ft (820 m) landward of the shore. At this point, the aqueduct again goes underground as it traverses through developed areas.

In the Ravenswood pond complex, gravity storm water lines feeding Atherton Channel and Bayfront Canal drain to Flood Slough.

Geodetic Control Monuments. All historical NGS control monuments adjacent to the Ravenswood pond complex were last located and surveyed in the 1950s and 1960s along the frontage road to the Dumbarton Bridge. The integrity and/or existence of these monuments is unknown. No current NGS-documented monuments are located within the Ravenswood pond complex boundaries. One NGS monument was located and reset in 2002 (PID DG6890) near the intersection of Willow Road and the Bayfront Expressway (SR 84) along the approach to the Dumbarton Bridge. This monument is outside of the Project Area and would not be affected by the Project. Additional geodetic control in the vicinity of the Ravenswood pond complex may be maintained by San Mateo County, Caltrans, or other agencies.

3.16.2 Regulatory Setting

This section provides the environmental and regulatory background necessary to analyze the effects on public services associated with the proposed Project. Applicable local and regional plans and policies were reviewed for information on existing land uses and policies.

Overhead Electrical Transmission Lines

General Order 95 from the California Public Utilities Commission (California Public Utilities Commission 2006) includes rules governing line clearance for overhead electrical transmission lines. It states the following:

Rule 11. Water areas not suitable for sailboating must have a line clearance of at least 25 ft (8 m) above high water.

Rule 12. Water areas suitable for sailboating, with a surface area over 2,000 acres, must have a line clearance of at least 47 ft (14 m) above high water.

General Order 95 states that Rule 11 can be applied to areas where sailboating is prohibited and where other boating activities are allowed.

Eden Landing

Hayward

The City of Hayward General Plan (City of Hayward 2003) includes the following relevant public service strategies, policies, and implementation measures:

- Public facilities will be maintained and operated in a manner that protects and enhances the environment;
- Control waste discharge to avoid contamination of water resources, damage to bay ecology and hill erosion;
- Utilize dredged silt and processed waste sludge productively, such as for marsh restoration and park development.

Union City

Union City's 2002 General Plan Policy Document (City of Union City 2002) includes the following relevant policy:

PF-B.1.4: Where some services are provided by other public entities, such as the Alameda County Water District (ACWD) and the Union Sanitary District (USD), the City shall coordinate construction efforts with these agencies to provide appropriate levels of service and minimize redundant construction costs.

Alviso

Fremont

The City of Fremont General Plan (City of Fremont 2003) includes the following relevant implementation measure:

Water, Flood, and Sanitary Sewer Services

Implementation 3: Work with the Alameda County Flood Control District to develop flood protection measures that provide protection from flooding while preserving natural plant formations and natural topographic features.

San Jose

The City of San Jose 2020 General Plan (City of San Jose 2004) does not provide relevant public services goals or policies associated with salt ponds.

County of Santa Clara

The County of Santa Clara General Plan (County of Santa Clara 1994) provides public services related strategies and policies associated primarily with new (urban) development and striking a balance and as

such are not related to the proposed Project. Strategy #4 of the General Plan identifies the need to improve quality of life for all segments of the population. Policy C-EC 8(g) recognizes the need for providing adequate and efficient public services.

Sunnyvale

The City of Sunnyvale General Plan (City of Sunnyvale 1995) includes the following relevant action statement:

Public Safety Element

4.2C.1c: Review proposals for new or rehabilitated properties so that minimum protection standards for access, water supply, fire resistive construction, exiting, fire protection equipment, and control of hazardous processes are considered.

Mountain View

The City of Mountain View 1992 General Plan (City of Mountain View 1992) does not provide specific relevant goals or policies associated with public utilities.

Ravenswood

Menlo Park

The City of Menlo Park General Plan Policy Document (City of Menlo Park 1994) does not provide specific relevant goals or policies associated with utilities and neither does the 2004 Menlo Park Municipal Code.

3.16.3 Environmental Impacts and Mitigation Measures

Overview

The SBSP Restoration Project would restore a substantial portion of the approximately 15,100-acre SBSP Restoration Project Area to tidal marsh, and would therefore contribute to changes in water levels, tidal flows and sedimentation patterns in the South Bay, the tidal sloughs, and the ponds over the 50-year planning horizon. These changes would potentially affect the operation and management of existing utilities (*e.g.*, electrical transmission lines and substations, gas pipelines, storm drains, pump stations, and wastewater treatment plant outfalls) located within the SBSP Restoration Project Area.

Significance Criteria

For the purposes of this EIS/R, the project would have a significant impact if it would:

- Substantially reduce the ability to access PG&E towers, stations, or electrical transmission lines;
- Reduce the integrity of PG&E's utility infrastructure;

- Reduce clearance between waterways and electrical transmission lines such that navigation of watercraft or regulatory compliance were affected;
- Change water level, tidal flow or sedimentation such that drainage of storm drains, operation of pumping facilities, or discharge of sewer force mains were substantially affected; or
- Disrupt Hetch Hetchy Aqueduct service so as to create a public health hazard or extended service disruption.

As explained in Section 3.1.2, while both CEQ Regulations for Implementing NEPA and the CEQA Guidelines were considered during the impact analysis, impacts identified in this EIS/R are characterized using CEQA terminology. Please refer to Section 3.1.2 for a description of the terminology used to explain the severity of the impacts.

Program-Level Evaluation

SBSP Long-Term Alternatives

SBSP Impact 3.16-1: Reduced ability to access PG&E towers, stations or electrical transmission lines.

As discussed in Section 3.16.1, PG&E overhead power transmission lines and towers are located throughout the Project Area. Access to these towers and stations is provided by light vehicles and boardwalks in most instances, although boat or helicopter access is also used. The Alviso pond complex and Ravenswood substation are the only areas where vehicular access for heavy equipment is required along or near the existing pond levee system for regular maintenance and emergency repairs.

Restoration of tidal habitat would affect access to PG&E facilities within the ponds for routine operations and maintenance due to physical and biological changes. Although heavy equipment access points would be largely unaffected, access to other locations currently provided by perimeter or internal levees would be reduced by tidal inundation and require alternative methods to reach boardwalks. Where the method of access is impacted by breached ponds, alternative equivalent access will be provided by the Project proponents. Increases in water surface elevations due to levee breaching could also result in inundation of existing boardwalks at high tide. In addition to these physical changes, restoration of salt marsh in breached ponds and bird density increases in reconfigured ponds would reduce access to PG&E towers and boardwalks since operation and maintenance activities would have the potential to result in disturbance, injury or mortality of endangered or threatened wildlife species. Access by PG&E to accommodate maintenance activities would include helicopter access to perform insulator washing; boat and foot patrols to manage problems associated with bird roosting and nesting materials; repairs due to bird electrocutions or collisions; and urgent foundation and structural repairs due to changing tidal flows. The presence of threatened or endangered species would restrict access during certain periods or require alternative methods of access, but USFWS and CDFG would continue to allow access for emergency repairs.

USFWS and PG&E have developed best management practices (BMPs) that have reduced or eliminated impacts to threatened or endangered species while allowing PG&E to meet its operation and maintenance

needs in a practical manner throughout the Refuge. Collaborating with PG&E, the Refuge will document these BMPs in special use permits (“SUPs” issued by USFWS) in order to avoid and minimize Project-related impacts to PG&E’s operation and maintenance, whether emergency or routine. Each SUP or modification to an existing SUP will help document what BMPs are necessary and which are a result of the Project. The SUPs will be included in the federal ESA Section 7 consultation for the Project. In this way, PG&E will receive legal assurances that its operation and maintenance activities are in compliance. Initially, USFWS will issue a SUP to PG&E for its facilities in the Phase 1 ponds – A6 and SF2 – that will include existing BMPs and any new requirements or modifications caused by the Project. USFWS will also issue a SUP (or as part of the one discussed above) for PG&E facilities on the Refuge outside of the Phase 1 ponds. This second SUP will serve as a reference point to understand how, or if, the Project may have any impact on PG&E during future phases of the Project.

Separate from the SBSP Restoration Project, PG&E is currently in the process of developing a Habitat Conservation Plan (HCP) under the federal ESA that would provide a regional framework for permitting PG&E’s routine operation and maintenance activities as well as minor new construction for the nine San Francisco 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 the training on AMM and coordination of compensation across the Bay Area. The BMPs developed for PG&E’s facilities on the Refuge (both the current BMPs and any additional ones needed because of changes caused by the Project) could be incorporated into the HCP once it is finalized and implemented.

Alternative A No Action. Over the 50-year planning horizon, unplanned levee breaches are expected to occur under SBSP Alternative A. Although the landowners would maintain a subset of the levees, all pond levees would be subject to intermittent failure. The levees identified as highest priority for maintenance would be repaired, but the remaining levees would be allowed to erode, re-introducing tidal inundation to some ponds. The levees providing protection from wind-wave erosion to PG&E towers within the SBSP Restoration Project Area and the PG&E substation would be repaired upon failure, with the exception of the Pond A6 levees. These intermittent failures would jeopardize routine and emergency access along the levees and potentially jeopardize the integrity of the towers and the boardwalks.

Under Alternative A, most of the perimeter levees in the Alviso pond complex would likely be maintained, limiting the extent of salt marsh and reductions to access due to threatened or endangered species. One exception is Pond A6, where outboard levees are subject to intense wave exposure and are expected to fail under Alternative A. PG&E has already modified its infrastructure in Pond A6 in anticipation that the levees around Pond A6 may fail.

Alternative A Level of Significance: Less than Significant

Alternative B Managed Pond Emphasis. Under SBSP Alternative B, 50 percent of the ponds within the SBSP Restoration Project Area would be restored to tidal inundation. In the Eden Landing and Alviso pond complexes, Ponds E6A, E10, E11 and A3W, all of which contain PG&E towers and some (E6A and A3W) of which contain boardwalk access, would remain managed ponds, and thus physical access would be unaffected. In the Ravenswood and Alviso pond complexes, several ponds (Ponds R1, R2, A2W,

AB1, AB2, A3N, and A6) containing PG&E towers and boardwalks would be restored to tidal marsh. The restoration would be designed to minimize or eliminate impacts to PG&E access, which may require upgrades to existing boardwalks, the creation of additional access routes, or potential tower relocations prior to breaching. On a pond-by-pond basis, the Project proponents would ensure that any of these potential improvements would be implemented as part of each phase of restoration actions. As the Project adaptively progresses along the staircase of tidal restoration, implementation of restoration actions at specific ponds may differ from the long-term alternatives identified in the EIS/R pending resolution of potential improvements required to protect PG&E facilities within the former salt ponds. To avoid or minimize impacts to PG&E facilities and access to those facilities for maintenance and repair, the Project will involve PG&E at the earliest practicable date in planning and design of restoration actions at the project level. Parts of the levees currently supporting vehicular access to PG&E's reconductoring access points in Ponds A2W and A3N (Figures 3.16-1 through 3.16-3) would be maintained as public access trails or otherwise improved as necessary. If required to maintain public safety, USFWS and CDFG would suspend public access to these trails as needed during periods of heavy vehicle use by PG&E crews. The existing high ground surrounding the PG&E substation adjacent to the Ravenswood pond complex would potentially be raised as needed to provide long-term flood protection if ground elevations are found to be too low. The western portion of Pond SF2 which contains PG&E boardwalks and towers would continue to be operated as a managed pond similarly to existing conditions. Therefore the restoration action at Pond SF2 is not expected to reduce access to the existing transmission lines due to an increase in the abundance of threatened and endangered species.

The largest potential impact to PG&E access is the presence of threatened or endangered species not already present within the tidally-restored areas. Access would likely be restricted during certain periods (*e.g.*, breeding seasons) or require alternative methods of access (*e.g.*, boat or helicopter). USFWS and PG&E have developed best management practices (BMPs) that have reduced or eliminated impacts to threatened or endangered species while allowing PG&E to meet its operation and maintenance needs in a practical manner throughout the Refuge. Collaborating with PG&E, the Refuge will document these BMPs in special use permits ("SUPs" issued by USFWS) in order to avoid and minimize Project-related impacts to PG&E's operation and maintenance, whether emergency or routine. Each SUP or modification to an existing SUP will help document what BMPs are necessary and which are a result of the Project. The SUPs will be included in the federal ESA Section 7 consultation for the Project. In this way, PG&E will receive assurances that its operation and maintenance activities are in compliance and the impacts from the Project would be reduced to less than significant.

Alternative B Level of Significance: Less than Significant

Alternative C Tidal Habitat Emphasis. The impacts and mitigating design features associated with Alternative B are also associated with Alternative C. However, Alternative C restores 90 percent of the ponds to tidal inundation. In addition to the ponds mentioned under Alternative B above, Ponds E6A, A2E, A22 and A23 would be restored to tidal inundation; therefore the potential for change to access to PG&E towers and stations under Alternative C is greater than under Alternative B.

As in Alternative B, vehicular access to PG&E's reconductoring access points in Ponds A2W and A3N would be maintained by providing public access trails along specific levees or otherwise improved as

necessary. Also, the existing high ground surrounding the PG&E substation adjacent to the Ravenswood pond complex would potentially be improved to provide flood protection. As discussed in Alternative B, the Project proponents would ensure that any of these potential improvements would be implemented at the project-level as part of implementation of restoration actions. USFWS and PG&E have developed best management practices (BMPs) that have reduced or eliminated impacts to threatened or endangered species while allowing PG&E to meet its operation and maintenance needs in a practical manner throughout the Refuge. Collaborating with PG&E, the Refuge will document these BMPs in special use permits (“SUPs” issued by USFWS) in order to avoid and minimize Project-related impacts to PG&E’s operation and maintenance, whether emergency or routine. Each SUP or modification to an existing SUP will help document what BMPs are necessary and which are a result of the Project. The SUPs will be included in the federal ESA Section 7 consultation for the Project. In this way, PG&E will receive assurances that its operation and maintenance activities are in compliance and the impacts from the Project would be reduced to less than significant.

Alternative C Level of Significance: Less than Significant

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

As discussed in Section 3.16.2, the minimum clearance between overhead electrical transmission lines and navigable water is 25 ft (8 m) for areas not suitable for sailboating and 47 ft (14 m) for areas suitable for sailboating. Under baseline conditions, clearance between PG&E’s overhead distribution lines and the water surface at high water ranges from 25 to 47 ft (8 to 14 m) within the SBSP Restoration Project Area.

Tidal restoration following uncontrolled breaching (Alternative A) or proposed restoration (Alternatives B and C) has the potential to increase the extent of open water and tidal channels within the restored ponds (see Appendix I, South Bay Geomorphic Assessment). The creation of new open water has the potential to introduce new line clearance requirements in areas where this had not been an issue under baseline conditions. Water levels are expected to increase in these regions due to sea level rise (see Appendix J, Hydrodynamic Modeling Report); the reductions in line clearance due to this effect are not a result of the SBSP Restoration Project (see Impact 3.16-2 in Chapter 4, Cumulative Impacts, for an analysis of this impact as it relates to sea level rise).

The potential for impacts would depend on existing line clearances, whether any lines would be raised to meet the required post-breach clearances, and whether public boating access would be restricted within the restoring marsh channels. USFWS would continue to prohibit public boating within restored areas except where it is expressly allowed for waterfowl hunting. CDFG would restrict or prohibit public boating within restored areas as necessary. Additionally, restoration elements would be designed, to the extent practical, to physically block boating access to restored ponds where conductor line clearances do not meet regulatory requirements. Proponents of the SBSP Restoration Project would evaluate the costs

and benefits of restoring ponds where line clearances need to be raised because of Project actions on a project-by-project basis (*i.e.*, at each future phase of implementation).

Alternative A No Action. As unplanned levee failures occur, tidal marsh channels and open water within the breached ponds could become accessible for small watercraft. The unplanned nature of the levee failures under Alternative A would pose the greatest risk of affecting existing line clearances as the necessary tower modifications would not necessarily be in place prior to tidal breaching. However, the levees surrounding ponds containing electrical transmission lines are most likely to be maintained. In addition to the effects of levee failure, sea level rise over the 50-year planning horizon would reduce line clearances within the tidal sloughs by approximately 0.5 ft (15 cm) (see Appendix J).

Although clearance below electrical transmission lines within breached ponds may not meet the 47-ft (14 m) requirement in some instances, USFWS would continue to prohibit public boating in the newly opened channels except where it is expressly allowed for waterfowl hunting. CDFG would restrict or prohibit public boating within restored areas as necessary.

Alternative A Level of Significance: Less than Significant

Alternative B Managed Pond Emphasis. Under SBSP Alternative B, 50 percent of the ponds within the SBSP Restoration Project Area would be restored to tidal inundation. In the Eden Landing and Alviso pond complexes, Ponds E6A, E10, E11 and A3W, all of which contain PG&E towers, would remain managed ponds, and thus clearance for PG&E's electrical transmission lines would be unaffected. In the Ravenswood and Alviso pond complexes, several ponds (Ponds R1, R2, A2W, AB1, AB2, A3N, and A6) containing PG&E towers would be tidally restored. The restoration would be designed to minimize or eliminate impacts to PG&E line clearances. On a pond-by-pond basis, the Project proponents would ensure that any of these potential improvements would be implemented as part of each phase of restoration actions. As the Project adaptively progresses along the staircase of tidal restoration, implementation of restoration actions at specific ponds may differ from the long-term alternatives identified in the EIS/R pending resolution of potential improvements required to protect PG&E facilities within the former salt ponds. To avoid or minimize impacts to PG&E facilities, the Project will involve PG&E at the earliest practicable date in planning and design of restoration actions at the project level. Proponents of the SBSP Restoration Project would evaluate the costs and benefits of restoring ponds where line clearances need to be raised because of Project actions on a project-by-project basis (*i.e.*, at each future phase of implementation). Under Alternative B, long-term sea level rise would result in line clearance reductions over the tidal sloughs by approximately 0.5 ft (15 cm) as in Alternative A.

USFWS would continue to prohibit public boating access within the restored areas except where it is expressly allowed for waterfowl hunting. CDFG would restrict or prohibit public boating within restored areas as necessary. Additionally, where needed, restoration elements would be designed to physically block public boating access to restored ponds where conductor line clearances do not meet applicable regulatory requirements.

Alternative B Level of Significance: Less than Significant

Alternative C Tidal Habitat Emphasis. Alternative C would result in the same types of changes as Alternative B, although the newly created area of navigable water within the tidal ponds would be substantially greater. As with SBSP Alternative B, USFWS would continue to prohibit public boating within the restoring and restored ponds and include design elements to physically prevent boating access to the degree practical. CDFG would restrict or prohibit public boating within restored areas as necessary. The restoration would also be coordinated with PG&E in order to raise and relocate PG&E towers as necessary in order to minimize potential impacts. As with Alternative B, the restoration would be designed to minimize or eliminate impacts to PG&E line clearances. On a pond-by-pond basis, the Project proponents would ensure that any of these potential improvements would be implemented as part of each phase of restoration actions. To avoid or minimize impacts to PG&E facilities, the Project will involve PG&E at the earliest practicable date in planning and design of restoration actions at the project level. Proponents of the SBSP Restoration Project would evaluate the costs and benefits of restoring ponds where line clearances need to be raised because of Project actions on a project-by-project basis (*i.e.*, at each future phase of implementation).

As with Alternatives A and B, water levels in sloughs are expected to increase in these regions due to sea level rise; these reductions in line clearance are not a result of the SBSP Restoration Project.

Alternative C Level of Significance: Less than Significant

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

PG&E towers need to have sufficient structural integrity to support overhead electrical transmission lines and accommodate increased tension during maintenance activities, such as reconductoring of lines. The concrete marine foundations on pilings and strength of the steel frame are important elements of the structure that influence the overall integrity of the towers. The following discussion assesses the potential for the alternatives to adversely affect the structural integrity of towers by affecting the marine foundation, piling or steel frame.

Alternative A No Action. The structural integrity of PG&E towers could be affected by increased inundation and associated corrosion, or by scour around the marine foundation. Increases in water levels due to levee breaching, more frequent levee overtopping, or changes in pond management could affect PG&E towers if the concrete cover were not adequate to protect the base of the steel structure from saline Bay water. Inundation or wind wave splash on steel portions of the tower would potentially accelerate corrosion and reduce the strength of the material. Protecting against corrosion may necessitate increasing the amount of concrete armoring around steel elements. The potential for increases in water levels and associated corrosion of steel portions of PG&E towers is generally limited to breached ponds. Water depths in managed ponds would be lower than baseline conditions in most instances. Periodic overtopping of managed pond levees during flood events would temporarily increase water levels. Overtopping would occur more frequently as levee conditions worsened.

Tidal restoration following unplanned breaching has the potential to increase tidal current velocities around the steel or wood pilings that support the towers. Tower foundations along slough channels downstream of breaches and along relict channels in ponds restored to tidal inundation are at greatest risk of exposure to scour. If sufficiently large, channel scour (deepening or widening) could undermine the structural integrity of the marine foundation or pilings. Several towers in the SBSP Restoration Project Area are immediately adjacent to relict channels that could be re-established. Exposure of pilings has not been reported when the tower foundations are located within vegetated marsh.

As levee failures occur over the 50-year planning horizon under Alternative A, downstream tidal current velocities in sloughs would increase in response to the additional tidal prism. The timing and nature of the levee failures is uncertain, and portions of the perimeter levee system are expected to be maintained. However, unplanned breaches to Ponds A6 and A5 would not be repaired and would increase the potential for scour around the foundations of towers at the mouth of Guadalupe Slough. To protect its existing facilities in Pond A6, PG&E replaced the eleven existing transmission towers with nine new towers and reconducted two of the three transmission lines. Potential for adverse effects to the structural integrity of PG&E towers along Coyote Creek or other ponds would be negligible since perimeter levees elsewhere in the Alviso pond complex would be maintained.

Alternative A Level of Significance: Potentially Significant

Alternative B Managed Pond Emphasis. Under Alternative B, approximately 50 percent of the ponds would be converted to tidal inundation. This would include several ponds that contain PG&E towers: Ponds A6, A5, A3N and AB2 along Guadalupe Slough, several of the ponds between Ponds A1 and A3N, and Ponds R1 and R2. Water depths in managed ponds would be lowered from baseline conditions in most instances. Therefore, impacts to the structural integrity of PG&E towers are generally limited to actions associated with tidal restoration.

Scour at the mouth of Guadalupe Slough could adversely affect the marine foundations and expose wooden pilings beneath the concrete if channel deepening and/or widening were sufficiently great. Tidal restoration would be coordinated with PG&E to improve the foundations or relocate the affected towers if future project-level analysis determined that the expected slough scour would threaten the existing structures. Increases in water levels are expected in ponds restored to tidal inundation and may also result in greater wind wave action before marsh vegetation is established. The net effect inside breached ponds may result in a need to increase the amount of concrete armoring around steel elements to prevent corrosion by tidal inundation or wave splash. Planning and design for each phase of the implementation would evaluate this need and include appropriate measures, such as providing adequate cover to the steel frame or upgrading the marine foundation in channels expected to scour. On a pond-by-pond basis, the Project proponents would ensure that any of these potential improvements would be implemented as part of each phase of restoration actions and before tidal restoration. As the Project adaptively progresses along the staircase of tidal restoration, implementation of restoration actions at specific ponds may differ from the long-term alternatives identified in the EIS/R pending resolution of potential improvements required to protect PG&E facilities within the former salt ponds. To avoid or minimize impacts to PG&E facilities, the Project will involve PG&E at the earliest practicable date in planning and design of restoration actions at the project level. Proponents of the SBSP Restoration Project would evaluate the

costs and benefits of restoring ponds where PG&E infrastructure would have to be substantially modified because of Project actions on a project-by-project basis (*i.e.*, at each future phase of implementation).

Alternative B Level of Significance: Less than Significant

Alternative C Tidal Habitat Emphasis. Under Alternative C, approximately 90 percent of the ponds would be converted to tidal habitat. In addition to the ponds identified under Alternative B, the only additional ponds that could affect PG&E towers are Pond E6A (contains 6 towers) and Ponds A9 through A17 that drain to Coyote Creek.

Effects to the structural integrity of PG&E towers inside ponds converted to tidal inundation would be similar to Alternative B, although this impact would extend to Pond E6A. As in Alternative B, planning for each phase of restoration would evaluate the need to improve the concrete cover of the steel frame or upgrading marine foundations and would involve PG&E at the earliest practicable date in planning and design. As under Alternative B, the Project proponents would ensure that any potential improvements would be implemented at the project-level as part of implementation of restoration actions and would be designed to avoid or minimize impacts to PG&E facilities.

Alternative C Level of Significance: Less than Significant

SBSP Impact 3.16-4: Changes in water level, tidal flow and sedimentation near storm drain systems.

Storm water facilities collect rainfall runoff from upland areas and discharge via gravity flow and/or pumping into the SBSP Restoration Project Area. These flows typically discharge to channels and sloughs leading to the Bay. Most drainage channels collect storm water from at least one outfall which discharges via gravity when water levels in the slough are lower than the outfall (at low tide). The following discussion addresses potential impacts to gravity-driven storm drainage. Potential impacts to storm drain systems that rely on pumping are addressed in SBSP Impact 3.16-5 below.

The potential for impacts depends on the change to low-tide elevations, amount of channel sedimentation near the outfall, the capacity of the storm drain system, and the ability of the structure to function properly with higher low-tide elevations of the receiving water. In storm drain systems that do not have the capacity to accommodate higher low-tide elevations or sedimentation near the outfall, reduced conveyance through the structures could potentially result in ponding of storm water in developed areas.

Impacts to storm drains were analyzed based on the results of the hydrodynamic modeling (see Appendix J). Water levels and bed shear stress were examined throughout the SBSP Restoration Project Area. Bed shear stress was examined to determine changes in scour potential and identify if erosion or deposition was likely in the future. Model simulations were run for Alternatives A and C, with the assumption that the impacts under Alternative B would lie between A and C based on the differences in the potential restored tidal prism.

Alternative A No Action. As levee failures occur over the 50-year planning horizon, water levels in the sloughs would change slightly, temporarily increasing low (tide) water levels. The timing and nature of the levee failures are uncertain. However, for a short period following unplanned breaching, the time during which affected storm drain outfalls would drain via gravity would be reduced. The potential for sedimentation at the location of the existing outfalls would also reduce effectiveness. In addition to the effects of tidal breaching, future sea level rise would reduce the conveyance of gravity-driven storm drains. Alternative A does not provide any mitigation measures to improve these conditions.

Uncontrolled breaching has the potential to raise the baseline low water elevations over the short term, thereby reducing the time discharge occurs through gravity-driven storm drains. Also, decreases in tidal current velocities upstream of levee breaches would increase the potential for sedimentation in the channel. This may adversely affect storm drains if channel sedimentation obstructs the outfall. Sea level rise over the next 50 years will likely increase water levels by 0.5 ft (15 cm) in tidal sloughs within the SBSP Restoration Project Area and will affect storm drain outfalls in a similar way.

Alternative A Level of Significance: Potentially Significant

Alternative B Managed Pond Emphasis. Under Alternative B, there would be slight increases in low water levels and decreases in upstream tidal current velocities in response to the increased tidal prism in the sloughs (see Appendix J) that would potentially affect storm drain systems. This potential effect would be evaluated for each phase of the SBSP Restoration Project to quantify the effect on specific storm drains and assess whether the phased implementation of Alternative B would require additional actions to reduce the impact to a less-than-significant level.

Planned restoration under Alternative B would have the potential to affect gravity-flow storm drains in the same way as unplanned breaches in Alternative A. However, restoration actions would include measures to address poor drainage through storm drains affected by changes in water level or sedimentation. Restoration activities would be coordinated with the storm drain utility owners in order to ensure that the storm drain infrastructure continues to meet their capacity needs. Storm drains would be redesigned, fitted with one-way flow tide gates, relocated, or pumped to ensure capacity requirements.

Sea level rise over the next 50 years will likely increase water levels by 0.5 ft (15 cm) in tidal sloughs within the SBSP Restoration Project Area and will affect storm drain outfalls; however, these effects are not a result of Project actions.

Alternative B Level of Significance: Less than Significant

Alternative C Tidal Habitat Emphasis. As in Alternative B, restoration actions under Alternative C have the potential to raise low tide elevations and decrease upstream tidal current velocities. Potential impacts to storm drains would be qualitatively similar to Alternative B but greater in extent and magnitude since more ponds would be breached in Alternative C.

Pending results from future project-level analysis, restoration activities would be coordinated with the storm drain utility owners in order to ensure that the storm drain infrastructure continues to meet their

capacity needs. Storm drains would be redesigned, fitted with one-way flow tide gates, relocated, or pumped to ensure adequate capacity is provided.

Alternative C Level of Significance: Less than Significant

SBSP Impact 3.16-5: Changes in water level, tidal flow and sedimentation near pumping facilities.

The urban areas adjacent to the SBSP Restoration Project Area contain several storm water lift stations that would discharge to sloughs upstream of the levee breaches (Moffatt & Nichol Engineers 2005). Lift stations are connected to discharge pipes that extend from the lift station to the adjacent slough where the discharge occurs. During storm events, storm water runoff from the surrounding developed areas flows through storm drain systems towards the Bay. In areas where discharge to the tidal sloughs via gravity flow is not possible, the storm water is pumped, or 'lifted,' and discharged into the adjacent sloughs.

Changes to water levels or sedimentation patterns generally do not substantially affect pumping facilities, unless water surface elevations during high tide are substantially raised or sediment accumulation at discharge locations block outfall structures.

Impacts to pumping facilities were analyzed based on the results of the hydrodynamic modeling (see Appendix J). Water levels and bed shear stress were examined throughout the SBSP Restoration Project Area. Bed shear stress was examined to determine changes in scour potential and identify if erosion or deposition was likely in the future. Model simulations were run for Alternatives A and C, with the assumption that the impacts under Alternative B would lie between A and C based on the differences in the potential restored tidal prism.

Alternative A No Action. Unplanned tidal conversion under Alternative A would potentially alter water levels within the South Bay and sloughs, although these changes in water level are not expected to affect the ability to operate existing pumping facilities. Decreases in tidal currents upstream of the levee breaches would potentially increase sedimentation. Although this effect has not been examined in detail, its impacts to pumping facilities are expected to be minimal.

Alternative A Level of Significance: Less than Significant

Alternative B Managed Pond Emphasis. Under Alternative B, 50 percent of the ponds within the SBSP Restoration Project Area would be restored to tidal inundation. Potential impacts to pumping facilities would be slightly greater in Alternative B than under Alternative A, due to the restoration of ponds draining to Guadalupe and Mountain View Sloughs. Overall, the expected changes in water levels and sedimentation patterns are not expected to substantially affect the operation of pumping facilities.

Alternative B Level of Significance: Less than Significant

Alternative C Tidal Habitat Emphasis. Under Alternative C, 90 percent of the ponds within the SBSP Restoration Project Area would be restored to tidal inundation. The sloughs affected by restoration under

Alternative C to which there are known storm water lift station connections are the same as in Alternative B. All lift stations are located upstream of the planned breaches. Overall, the changes in water levels and sedimentation patterns are not expected to substantially affect the operation of pumping facilities.

Alternative C Level of Significance: Less than Significant

SBSP Impact 3.16-6: Changes in water level, tidal flow and sedimentation near sewer force mains and outfalls.

The San Jose/Santa Clara WPCP and the City of Sunnyvale WPCP discharge to sloughs which drain portions of the Alviso pond complex. The San Jose/Santa Clara WPCP discharges to Artesian Slough upstream of the Project boundary and the City of Sunnyvale WPCP discharges to Moffett Channel, which drains to Guadalupe Slough adjacent to Pond A5. The City of Palo Alto Regional Water Quality Control Plant outfall is located between the Ravenswood and Alviso pond complexes. Although discharges from these facilities occur outside the SBSP Restoration Project Area, they are close enough that regional-level hydrodynamic changes may affect the operation of the outfalls. In addition to these outfalls, there are two sewer force mains located along the SBSP Restoration Project Area boundaries. One is adjacent to the northern edge of Pond A22 in the Alviso pond complex, and the other extends along the eastern and northern edges of Pond E6A and within the Eden Landing Ecological Reserve.

Alternative A No Action. Unplanned levee failures and breaches under Alternative A would potentially alter water levels and sedimentation patterns within the sloughs. Impacts to wastewater outfalls in the affected areas are expected to be similar to impacts to pumping facilities and would be less than significant. The sewer force mains are located along the SBSP Restoration Project Area boundaries near Pond E6A in the Eden Landing pond complex and the upland edge of Pond A22 in the Alviso pond complex. Based on their locations, and the assumptions of which levees would be maintained for flood control purposes (see Section 2.4 in Chapter 2), the impacts to the sewer force mains would be minimal.

Alternative A Level of Significance: Less than Significant

Alternative B Managed Pond Emphasis. Under Alternative B, 50 percent of the ponds within the SBSP Restoration Project Area would be restored to tidal inundation. As in Alternative A, changes to water levels and sedimentation patterns would have minor impacts to the San Jose/Santa Clara, Sunnyvale, and Palo Alto outfalls. As with Alternative A, Alternative B would not result in a significant impact to sewer force mains due to their locations along the perimeter of the SBSP Restoration Project Area.

Alternative B Level of Significance: Less than Significant

Alternative C Tidal Habitat Emphasis. Under Alternative C, 90 percent of the ponds within the SBSP Restoration Project Area would be restored to tidal inundation. Impacts to sewer force mains would be similar to Alternative B and would be less than significant.

Alternative C Level of Significance: Less than Significant***S BSP Impact 3.16-7: Disrupt Hetch Hetchy Aqueduct service so as to create a public health hazard or extended service disruption.***

The Hetch Hetchy Aqueduct, which carries water from the Hetch Hetchy Reservoir in Yosemite National Park to San Francisco and other communities in the Bay Area crosses the South Bay just south of the Dumbarton Bridge and south of Pond SF2 in the Ravenswood pond complex adjacent to Southern Pacific's Dumbarton Cutoff train bridge. The Aqueduct is located above the Bay surface along a trestle from the western shore to the middle of the Bay where it plunges below the surface at the western edge of the main South Bay channel. The buried section of the Aqueduct then emerges from the Bay on the Fremont shore. Plans to construct a tunnel for the Hetch Hetchy Aqueduct crossing are currently being developed.

Potential impacts associated with shoreline change were analyzed using the results from sediment budget analysis of landscape-scale geomorphic change across the South Bay based on historical data and recent trends (see Appendix I). The SBGA provides an overview of the potential magnitude of regional geomorphic changes in the South Bay 50 years into the future for the three alternatives. There is considerable uncertainty in the predictions of long-term geomorphic response since the SBGA analysis relies on assumptions concerning sediment dynamics to calculate sediment inputs and outputs. This analysis indicates that future sea level rise and changes to the sediment budget due to tidal restoration may result in shoreline retreat. Substantial shoreline retreat in the immediate vicinity of the Hetch Hetchy Aqueduct could threaten the structural integrity of the facility.

Alternative A No Action. Assuming the projected morphologic and shoreline changes follow historic trends over the 50-year planning horizon, the far South Bay would accrete approximately 1.1 ft (0.34 m) of sediment (see Appendix I). Historically, marsh along the south shoreline of the far South Bay has eroded, while marsh along the north as eroded and accreted (no net change). Although the spatial distribution of geomorphic changes are not specified in the SBGA, the historical trends would suggest that most of the marsh losses in the far South Bay would occur in the higher-energy south shore than the north shore. Shoreline armoring could be required to protect the integrity of the Aqueduct. Although results from the sediment budget analysis contain substantial uncertainties, much of the projected shoreline change is expected to result from future sea level rise.

Alternative A Level of Significance: Less than Significant

Alternative B Managed Pond Emphasis. Under Alternative B, the far South Bay would accrete approximately 0.4 ft (0.12 m) of sediment over the next 50 years (see Appendix I). Much of the shoreline retreat in the far South Bay would occur in the higher-energy south shore if historical trends continue. As in Alternative A, much of the projected change is largely due to future sea level rise; therefore, it is not a direct result of the SBSP Restoration Project.

Alternative B Level of Significance: Less than Significant

Alternative C Tidal Habitat Emphasis. Under Alternative C, results from the sediment budget analysis indicate that the far South Bay mudflats would erode by approximately 0.7 ft (0.22 m) over the next 50 years (see Appendix I). This erosion is not expected to adversely affect the integrity of the anticipated tunnel for the Hetch Hetchy Aqueduct; however, additional analysis and monitoring would be performed in order to ensure the safety of the Aqueduct. Unlike the other alternatives, it is less certain whether sea level rise or tidal breaching would be the dominant factor in influencing shoreline retreat. Shoreline armoring near the Aqueduct would be added if monitoring data indicates localized retreat in this area.

Alternative C Level of Significance: Less than Significant

S BSP Impact 3.16-8: Disruption of rail service due to construction of coastal flood levees and tidal habitat restoration.

The Union Pacific Railroad (UPRR) provides rail service that crosses the proposed levee to provide flood protection near the community of Alviso in Alternatives B and C (Figure 3.16-2). The location of the crossing would likely be between Ponds A13 and A16. Results from the Flood Analysis Report (PWA 2006) (Appendix E) indicate that the proposed levee to provide flood protection in this vicinity would have crest elevations on the order of 16 to 22 ft (5 to 7 m) NAVD, depending whether the outboard pond were managed or breached. Lidar data indicate that the existing elevation of the UPRR in this area is approximately 6 ft (2 m) NAVD. Based on these data, the existing UPRR would need to be raised by approximately 10 to 15 ft (3 to 5 m) in order to cross the proposed levee to provide flood protection. The crossing would be located between the southwest corner of Pond A16 and the southeast corner of Pond A13. Subsequent design activity would identify the levee crest elevations and required improvements to the UPRR more precisely. Construction of the levee to provide flood protection along the landward sides of Ponds A12, A13, and A16 would need to be coordinated with improvements to the UPRR to reduce the disturbance of these activities on rail service.

In addition to construction of the proposed levee to provide flood protection, tidal restoration of ponds immediately adjacent to the UPRR (Ponds A13 and A15 under Alternative C) has the potential to affect rail service through direct tidal inundation, since existing pond management keep water levels below Bay high water levels.

Alternative A No Action. Since no levees that provide flood protection are proposed under Alternative A, the existing UPRR near Pond A16 would not be affected.

Alternative A Level of Significance: Less than Significant

Alternative B Managed Pond Emphasis. Under Alternative B, the crest of the levee that provides flood protection in the community of Alviso would have an elevation of approximately 16 ft (5 m) NAVD (PWA 2006)(Appendix E), based on maintaining managed ponds as the outboard land use. Levee construction would be coordinated with improvements to the UPRR near the southwest corner of

Pond A16 so disturbance to rail service would be reduced to the extent possible. Details of the levee that provides flood protection and improvement to the UPRR would be generated during subsequent planning stages prior to implementation. Impacts on rail service during construction would be potentially significant and be reduced to a less-than-significant level with implementation of SBSP Mitigation Measure 3.16-1 below.

Since Ponds A13 and A15 are maintained as managed ponds under Alternative B, pond levee breaching (tidal habitat restoration) would not affect rail service through direct tidal inundation.

SBSP Mitigation Measure 3.16-8: The landowners shall coordinate with UPRR on the design of the UPRR improvements to ensure that rail service is maintained during construction of flood control and restoration elements in and around Pond A16.

Alternative B Level of Significance: Less than Significant with Mitigation

Alternative C Tidal Habitat Emphasis. Under Alternative C, the crest of the levee to provide flood protection in the community of Alviso would vary from approximately 16 to 22 ft (5 to 7 m) NAVD (PWA 2006) (Appendix E), based on restoring the outboard ponds. Impacts to the UPRR line would be qualitatively similar but slightly greater in magnitude due to the higher flood levee along Pond A12. As in Alternative B, levee construction would be coordinated with improvements to the UPRR so that disturbance to rail service is reduced to the extent possible. Impacts on rail service during construction would be potentially significant and be reduced to a less-than-significant level with implementation of SBSP Mitigation Measure 3.16-1 above.

Since Ponds A13 and A15 would be restored to tidal habitat under Alternative C, the need to raise railroad elevations adjacent to these ponds would be determined during subsequent project-level design stages.

Alternative C Level of Significance: Less than Significant with Mitigation

SBSP Impact 3.16-9: Reduced access to sewer force mains due to levee construction.

The EBDA effluent disposal system includes a buried sewer force main that borders an approximately 3,000-ft long segment of the northern edge of Pond E6A (Figure 3.16-1). Grading along this levee segment, such as for managed pond or flood protection improvements, would need to be designed such that EBDA would be able to maintain access to the manholes along the buried sewer force main. Possible design elements that could affect continued access are levee crest width (for vehicle access) and geometry of the cross-section (for geotechnical considerations). This potential grading would also consider potential geotechnical impacts, as discusses in Section 3.5, Geology, Soils, and Seismicity.

Alternative A No Action. Since Pond E6A is maintained as a managed pond in Alternative A, no improvements to its perimeter levees would be required. Therefore, the EBDA sewer force main would not be affected.

Alternative A Level of Significance: No Impact

Alternative B Managed Pond Emphasis. Since Pond E6A is maintained as a managed pond in Alternative B, no improvements to its perimeter levees would be required. However, subsequent project-level design may determine that a levee to provide flood protection would be required along the northern edge of Pond E6A if existing high ground elevations do not provide adequate protection. The design of such a levee to provide flood protection, if any, would include elements such that continued maintenance to the EBDA sewer force main would not be adversely affected.

Alternative B Level of Significance: Less than Significant

Alternative C Tidal Habitat Emphasis. Under Alternative C, Pond E6A would be breached to tidal action and improvements to its perimeter levee would be required. Subsequent design phases would define the level of levee improvements, if any. In order to avoid reduced access to the EBDA facilities, any levee improvements along the northern edge of Pond E6A would be wide enough to provide access to manholes along the buried sewer force main.

Alternative C Level of Significance: Less than Significant

Project-Level Evaluation

Phase 1 Impact 3.16-1: Reduced ability to access PG&E towers, stations or electrical transmission lines.

The following sections evaluate potential access impacts to PG&E towers and stations for the Phase 1 ponds that contain PG&E towers and stations. Phase 1 ponds that do not contain PG&E infrastructure (*i.e.*, actions within Ponds E12 and E13; E8, E8X and E9; A8 and A16) would not impede PG&E access.

Phase 1 No Action

The following discussion addresses the No Action Alternative (Alternative A) at the project level.

Eden Landing. Ponds E12, E13, E8A, E9 and E8X do not contain PG&E towers or stations, and therefore, the No Action scenario would not impede access to these facilities.

Eden Landing Phase 1 No Action Level of Significance: No Impact

Alviso. The paragraphs below discuss the No Action scenario for the Phase 1 Ponds at the Alviso pond complex.

Pond A6. A PG&E overhead power distribution line and several towers are located within Pond A6. The No Action scenario assumes that levees around Pond A6 are less likely to be maintained and would eventually fail. Salt marsh would develop in Pond A6 over time, which would require PG&E to avoid certain breeding bird windows, although the presence of California gulls restricts access similarly under

baseline conditions. To protect its existing facilities in Pond A6 in the event of an unplanned breach, PG&E replaced the eleven existing transmission towers with nine new towers and reconnected two of the three transmission lines. In addition, PG&E previously replaced its boardwalk that it uses to service the transmission towers and lines in Pond A6. Unplanned levee breaches would reduce vehicular access around the perimeter of Pond A6, but this access route is not essential since the primary locations for power line reconnection in the Alviso pond complex are in Ponds A3N, A2W, A19 and A22.

Pond A8. The No Action scenario assumes that the levee to the west of Pond A8 would likely be maintained and the pond would continue to be operated as a seasonal pond. Future improvements to this levee would be coordinated with PG&E such that the overhead power distribution line along the perimeter levee between Pond A8 and Ponds A5 and A7 would be maintained if continued service of the Pump at Pond A8 is desired.

Pond A16. No PG&E facilities occur within Pond A16, and therefore, the No Action scenario would not reduce access to power towers or stations.

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

Ravenswood. The No Action scenario assumes that Pond SF2 would be maintained as a managed pond. Access to the PG&E towers and boardwalks would not be affected.

Ravenswood Phase 1 No Action Level of Significance: No Impact

Phase 1 Actions

The following discussion addresses the Phase 1 actions (the first phase of Alternatives B and C) at the project level.

Eden Landing. Phase 1 actions at the Eden Landing pond complex would occur within ponds that do not contain PG&E infrastructure, and therefore, they would not impede access to PG&E facilities.

Eden Landing Phase 1 Actions Level of Significance: No Impact

Alviso. The paragraphs below discuss Phase 1 actions at the Alviso pond complex that would affect access to PG&E towers and stations.

Pond A6. A PG&E overhead power distribution line and several towers are located within Pond A6 and the pond's outboard levee provides maintenance vehicle access to these structures. Implementation of the Phase 1 action would increase water levels and sediment deposition in Pond A6. To protect its existing facilities in Pond A6, PG&E replaced the eleven existing transmission towers with nine new towers and reconnected two of the three transmission lines. In addition, PG&E previously replaced its boardwalk that it uses to service the transmission towers and lines in Pond A6. Levee breaches associated with the Phase 1 action would eliminate vehicular access around the perimeter of Pond A6, but vehicle access to the pond landward of the levee breaches would continue. Vehicle access to Pond A6 structures is not essential since the primary location for power line reconnection is in Pond A3W. Therefore, PG&E's

existing boardwalk would be extended and a platform would be constructed to allow for the delivery of heavy equipment (via helicopter) needed for certain O&M activities. In addition, for more routine O&M activities, the boardwalk will be extended through the marsh outside the levee to connect with the existing boat dock. Over time, salt marsh is expected to form and provide habitat for salt marsh harvest mouse and the California clapper rail. This would require PG&E to avoid certain breeding windows, although the presence of California gulls restricts access similarly under baseline conditions. USFWS would issue a SUP to PG&E that would document current BMPs as well as any additional BMPs necessitated by the Project. The SUP would be included in the federal ESA Section 7 consultation for the Project, giving PG&E appropriate assurances that it would be in compliance and reducing any impacts to less than significant.

Pond A8. A PG&E overhead power distribution line located along the internal levee between Pond A8 and Ponds A5 and A7 provides electricity to the pump at Pond A8, which is used by USFWS to convey water between Ponds A8 and A7. Implementation of the Phase 1 action would include demolition and removal of the existing overhead power distribution lines prior to restoration of muted tidal action.

Pond A16. Phase 1 actions at Pond A16 would occur within ponds that do not contain PG&E infrastructure, and therefore, they would not impede access to PG&E facilities.

Alviso Phase 1 Actions Level of Significance: Less than Significant

Ravenswood. A PG&E overhead power distribution line and several towers are located within Pond SF2. The western portion of Pond SF2, which contains PG&E boardwalks and towers, would continue to be operated as a managed pond similarly to existing conditions. Nesting islands would not be constructed in the western cell; therefore the restoration action at Pond SF2 is not expected to reduce access to the existing transmission lines due to an increase in the abundance of threatened and endangered species. Access boardwalks located in the immediate vicinity of the intake and outtake canals may be replaced or relocated as necessary to allow continued access. USFWS would coordinate with PG&E to ensure boardwalks are upgraded, if necessary, and foot access is maintained to the tower footings.

Ravenswood Phase 1 Actions Level of Significance: Less than Significant

Phase 1 Impact 3.16-2: Reduced clearance between waterways and PG&E electrical transmission lines.

The following discussion evaluates the potential impact to clearance between waterways navigable by sailboat and PG&E overhead electrical transmission lines. Only tidal restoration at Pond A6 has the potential for reducing line clearance as it is the only Phase 1 location that restores tidal inundation to an area with overhead transmission lines under the No Action and Action scenarios. Other Phase 1 locations either do not contain electrical transmission lines (*e.g.*, Ponds E8A, E8X and E9) or would continue to be operated as managed ponds (*e.g.*, Pond SF2). In these instances, Phase 1 actions would result in no

impacts. The Phase 1 actions for managed ponds and public access would also result in negligible impacts.

Phase 1 No Action

The following discussion addresses the No Action Alternative (Alternative A) at the project level.

Eden Landing. No PG&E electrical transmission lines occur in any of the Phase 1 locations within the Eden Landing pond complex.

Eden Landing Phase 1 No Action Level of Significance: No Impact

Alviso. Unplanned levee failure at Pond A6 would increase water levels in the pond. PG&E has replaced the eleven previously existing transmission towers with nine new towers, reconductored two of the three transmission lines, and raised its lines to the 47 ft clearance. USFWS would continue to prohibit public boating access to Pond A6. As mentioned above, no electrical transmission lines occur in Ponds A8 or A16.

Alviso Phase 1 No Action Level of Significance: No Impact

Ravenswood. The No Action scenario assumes that Pond SF2 would be maintained as a managed pond. Clearance of overhead transmission lines would not be affected.

Ravenswood Phase 1 No Action Level of Significance: No Impact

Phase 1 Actions

The following discussion addresses the Phase 1 actions (the first phase of Alternatives B and C) at the project level.

Eden Landing. Phase 1 actions at the Eden Landing pond complex would occur within ponds that do not contain PG&E infrastructure, and therefore, they would not affect clearance between waterways and PG&E transmission lines.

Eden Landing Phase 1 Actions Level of Significance: No Impact

Alviso. The paragraphs below discuss Phase 1 actions at the Alviso pond complex that would affect clearance between waterways and PG&E electrical transmission lines.

Pond A6. PG&E has replaced the eleven previously existing transmission towers with nine new towers, reconductored two of the three transmission lines, and raised its lines to the 47 ft clearance. USFWS would continue to prohibit public boating access to Pond A6.

Ponds A8 and A16. Phase 1 actions at Ponds A8 and A16 would occur within ponds that do not contain PG&E infrastructure, and therefore, they would not affect clearance between waterways and PG&E transmission lines.

Alviso Phase 1 Actions Level of Significance: No Impact

Ravenswood. The Phase 1 action at Pond SF2 would not affect clearance between navigable waterways and PG&E transmission lines.

Ravenswood Phase 1 Actions Level of Significance: No Impact

Phase 1 Impact 3.16-3: Reduced structural integrity of PG&E towers.

The following discussion evaluates the potential impact to the structural integrity of PG&E towers. Only changes to baseline conditions that raise pond water levels or restore tidal prism to sloughs upstream of towers have the potential to affect the structural integrity of these facilities.

Phase 1 No Action

The following discussion addresses the No Action Alternative (Alternative A) at the project level.

Eden Landing. No PG&E towers occur in this pond complex or in sloughs downstream of Phase 1 locations in the Eden Landing pond complex.

Eden Landing Phase 1 No Action Level of Significance: No Impact

Alviso. Levee failures and unplanned breaches upstream of the PG&E towers would increase tidal prism at the mouth of Guadalupe Slough and/or Alviso Slough, possibly inducing channel widening and potentially undermining the integrity of the towers. Levee failure is more likely to occur along the bayfront levee, which is subject to wind wave action and erosion under baseline conditions. However, if levee failure immediately adjacent to a tower were expected, USFWS would coordinate with PG&E to provide localized levee protection to avoid scour around the tower foundation. Although unplanned levee breaches would increase pond water levels, PG&E has replaced and raised the tower footings within Pond A6 and made other modifications in anticipation of unplanned levee breaches.

As mentioned above, the continued pond management of Ponds A8 or A16 would not affect the structural integrity of PG&E towers. Pond A16 has no PG&E infrastructure. Pond A8 has an electrical distribution line that serves the Pond A8–A7 pump. More frequent overtopping of the Pond A8 levees during flood events would temporarily increase water levels. Water level increases would be short-lived. The Pond A8–A7 pump is for managed pond water level management (not flood protection) and not a critical piece of infrastructure.

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

Ravenswood. Continued pond management of Pond SF2 would not affect the structural integrity of the PG&E towers in the pond. More frequent overtopping of the Pond SF2 levees during flood events would

temporarily increase water levels. Although water level increases would be short-lived, they have the potential to affect the structural integrity of the seven towers in the pond.

Ravenswood Phase 1 No Action Level of Significance: Potentially Significant

Phase 1 Actions

The following discussion addresses the Phase 1 actions (the first phase of Alternatives B and C) at the project level.

Eden Landing. Phase 1 actions at the Eden Landing pond complex would occur within ponds that do not contain PG&E infrastructure, and therefore, they would not affect the structural integrity of PG&E towers.

Eden Landing Phase 1 Actions Level of Significance: No Impact

Alviso. The paragraphs below discuss Phase 1 actions at the Alviso pond complex that would affect the structural integrity of PG&E towers.

Pond A6. Tidal restoration at Pond A6 is expected to have a minimal impact to channel scour at the mouth of Guadalupe Slough. Only one of the four perimeter breaches occurs along Guadalupe Slough upstream of the towers. Results from empirical relations between tidal prism and channel size indicate that widening at the mouth of the slough would be less than 50 ft (15 m) and not undermine the structural integrity of marine foundations along the banks of Guadalupe Slough.

Levee breaching at Pond A6 would also increase pond water levels above baseline for parts of the tide cycle (high tide). To protect its existing facilities in Pond A6, PG&E replaced the eleven existing transmission towers with nine new towers and reconducted two of the three transmission lines. In addition, PG&E previously replaced its boardwalk that it uses to service the transmission towers and lines in Pond A6.

Ponds A8 and A16. Phase 1 actions at Ponds A8 and A16 would occur within ponds that do not contain PG&E towers, and therefore, they would not affect their structural integrity.

Alviso Phase 1 Actions Level of Significance: Less than Significant

Ravenswood. The western portion of Pond SF2, which contains PG&E towers, would continue to be operated as a managed pond similar to existing conditions. Therefore, the Phase 1 action at Pond SF2 would not substantially affect the structural integrity of PG&E towers.

Ravenswood Phase 1 Actions Level of Significance: Less than Significant

Phase 1 Impact 3.16-4: Changes in water level, tidal flow and sedimentation near storm drain systems.

The following discussion evaluates potential impacts near storm drain systems for unplanned levee breaches in the No Action scenario and the tidal restoration Phase 1 actions. The Phase 1 actions for managed pond restoration and public access actions would result in negligible impacts to storm drain systems.

Phase 1 No Action

The following discussion addresses the No Action Alternative (Alternative A) at the project level.

Eden Landing. No gravity-flow storm drains were identified in the vicinity of Ponds E12, E13, E8A, E9, E8X, or their surrounding sloughs (Moffatt & Nichol Engineers 2005). Therefore no impacts are expected in this pond complex.

Eden Landing Phase 1 No Action Level of Significance: Less than Significant

Alviso. Unplanned levee breaches at Pond A6 would not result in a significant impact to storm drain systems along Alviso Slough because the pond is located well downstream of any potential gravity-driven outfalls. Continued managed pond operations at Ponds A8 and A16 would not result in impacts to storm drain systems.

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

Ravenswood. Continued managed pond operations at Pond SF2 would result in impacts to storm drain systems.

Ravenswood No Action Level of Significance: No Impact

Phase 1 Actions

The following discussion addresses the Phase 1 actions (the first phase of Alternatives B and C) at the project level.

Eden Landing. The paragraphs below discuss Phase 1 actions at the Eden Landing pond complex that would affect water levels, tidal flow and sedimentation near storm drain systems.

Ponds E8A, E9, and E8X. No gravity-flow storm drains were identified in the vicinity of Ponds E8A, E9, and E8X and the surrounding sloughs (Moffatt & Nichol Engineers 2005). The absence of gravity-flow storm drains would be verified during subsequent design stages. If any such drains are identified, the Project would be designed to ensure that impacts are negligible.

Ponds E12 and E13. As noted above, managed pond restoration and public access actions would result in negligible impacts to storm drain systems.

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

Alviso. The paragraphs below discuss Phase 1 actions at the Alviso pond complex that would affect water levels, tidal flow and sedimentation near storm drain systems.

Pond A6. The Phase 1 action at Pond A6 would not result in a significant impact to the storm drain system because the pond is located well downstream of any potential storm drain structures.

Pond A8. Hydrodynamic modeling (PWA and others in progress) (Appendix J) indicates that there would be a temporary increase in low-tide elevations in Alviso Slough until the slough enlarges in response to tidal prism mobilized during Phase 1. These changes could have the potential to affect gravity-flow storm drains. A 24-inch gravity-driven storm drain outfall discharged to Alviso Slough at the landward edge of the abandoned county marina, although it does not function under baseline conditions due to sedimentation over the past decades. Four additional gravity-driven outfalls discharge to lower Guadalupe River near SR 237 (Moffatt & Nichol Engineers 2005).

Restoration actions at Pond A8 would be designed to minimize impacts to the upstream storm drain systems (invert elevations of the outfalls are unknown at this time), and the discharge pipes would be improved or relocated as necessary in coordination with the operating agencies.

Pond A16. As noted above, managed pond restoration and public access actions would result in negligible impacts to storm drain systems.

Alviso Phase 1 Actions Level of Significance: Less than Significant

Ravenswood. As noted above, managed pond restoration and public access actions would result in negligible impacts to storm drain systems.

Ravenswood Phase 1 Actions Level of Significance: No Impact

Phase 1 Impact 3.16-5: Changes in water level, tidal flow and sedimentation near pumping facilities.

The following discussion evaluates potential impacts near pumping stations for the Phase 1 locations involving unplanned levee breaches and tidal restoration. The Phase 1 actions for managed pond restoration and public access actions would result in negligible impacts to pumping stations.

Phase 1 No Action

The following discussion addresses the No Action Alternative (Alternative A) at the project level.

Two pumping facilities occur in the vicinity of the Phase 1 ponds within the Eden Landing pond complex: the Patterson Creek lift station along OAC and the Mt. Eden Creek lift station. These stations are both upstream of the Eden Landing pond complex. The Patterson Creek lift station along OAC is located

approximately 3.4 miles (4 km) upstream of the Eden Landing pond complex. The Mt. Eden Creek lift station pumps storm water through a buried culvert for approximately 0.25 mile (0.4 km) before discharging to Mt. Eden Creek. Although unplanned levee breaches could temporarily affect water level, tidal flow and sedimentation along Mt. Eden Creek and the lower reaches of OAC (downstream of the Patterson Creek lift station), no changes are expected to water surface elevations during high tide. Therefore, any potential changes resulting from unplanned breaches at the Eden Landing pond complex are not expected to affect the ability to operate the existing pumping facilities.

Two storm water lift stations are located in the community of Alviso which discharge to Alviso Slough and lower Guadalupe River (Moffatt & Nichol Engineers 2005). However, these systems discharge relatively far upstream of any potential unplanned breaches in the Pond A6 perimeter levee.

As mentioned above, managed pond operation at Ponds A8, A16 and SF2 would result in negligible impacts to pumping stations.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions

The following discussion addresses the Phase 1 actions (the first phase of Alternatives B and C) at the project level.

Eden Landing. The paragraphs below discuss Phase 1 actions at the Eden Landing pond complex that would affect water levels, tidal flow and sedimentation near pumping facilities.

Ponds E8A, E9 and E8X. The operation of the pumping stations depends on the water levels in the sloughs as well as the proper operation of the discharge pipes. The implementation of the Phase 1 action at Ponds E8A, E9 and E8X would cause slight temporary changes in low-tide water levels in the sloughs, but changes to high tide would be negligible (see Appendix J). These temporary changes would result in a less-than-significant impact since only minor adjustments to the operation of the pump would be required, if any. No physical upgrades would be required since high tide elevations are unaffected.

Ponds E12 and E13. As noted above, managed pond restoration and public access actions would result in negligible impacts to pumping stations.

Alviso. The paragraphs below discuss Phase 1 actions at the Alviso pond complex that would affect water levels, tidal flow and sedimentation near pumping facilities.

Pond A6. The Phase 1 action at Pond A6 would not result in a significant impact to pumping facilities because the pond is located well downstream of any pumping stations.

Pond A8. Two storm water lift stations are located in the community of Alviso which discharge to Alviso Slough and lower Guadalupe River (Moffatt & Nichol Engineers 2005). Additionally, Pond A5 receives pumped water from Pond A4 via a siphon under Guadalupe Slough. The ability to operate the pumping stations primarily depends on the high-tide water levels in the receiving water.

Hydrodynamic modeling predicts that tidal restoration along upper Alviso Slough would result in temporary changes to tidal fluctuations under baseline conditions (Figure 3.16-2). However, no increase in high-tide elevation would occur, and lift stations discharging to Alviso Slough and lower Guadalupe River would continue to function. Implementation of the Phase 1 action at Pond A8 would, however, result in approximately a 1-ft (0.3-m) increase in water depths in Pond A5 when the notch is open. This increase in pond water depth would require more electricity to operate the pump that conveys water from Pond A4 to Pond A5, although the existing pump would continue to function.

Pond A16. As noted above, managed pond restoration and public access actions would result in negligible impacts to pumping stations.

Ravenswood. As noted above, managed pond restoration and public access actions would result in negligible impacts to pumping stations.

Phase 1 Actions Level of Significance: Less than Significant

Phase 1 Impact 3.16-6: Changes in water level, tidal flow and sedimentation near sewer force mains and outfalls.

The following sections evaluate potential impacts near sewer force mains and outfalls. Phase 1 Ponds A6 and A16 are located on sloughs downstream of WWTP outfalls and therefore have the potential for impacts. The remaining Phase 1 locations are not in the vicinity of sewer force mains or outfalls and would result in negligible impacts.

Phase 1 No Action

The following discussion addresses the No Action Alternative (Alternative A) at the project level.

There are no sewer force main or outfalls in the vicinity of the Phase 1 locations in the Eden Landing and Ravenswood pond complexes. However, the City of Sunnyvale's WPCP outfall discharges to Moffett Channel, which then flows into Guadalupe Slough near Pond A5. Unplanned breaching of Pond A6 could result in slight changes to water levels and sedimentation patterns in Guadalupe Slough although these changes would occur far enough downstream not to change conditions near the WPCP outfall.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions

The following discussion addresses the Phase 1 actions (the first phase of Alternatives B and C) at the project level.

Eden Landing. The Phase 1 actions in the Eden Landing pond complex are not located in the vicinity of sewer force mains or outfalls and would result in negligible impacts.

Eden Landing Phase 1 Actions Level of Significance: No Impact

Alviso. The paragraphs below discuss Phase 1 actions at the Alviso pond complex that would affect water levels, tidal flow and sedimentation near sewer force mains and outfalls.

Pond A6. The City of Sunnyvale's WPCP outfall discharges to the Moffett Channel, which then flows into Guadalupe Slough near Pond A5. The Phase 1 action at Pond A6 would result in slight changes to water levels and sedimentation patterns in Guadalupe Slough. These changes would occur far enough downstream not to change conditions near the WPCP outfall.

Pond A8. The Phase 1 action at Pond A8 is not located in the vicinity of sewer force mains or outfalls and would result in negligible impacts.

Pond A16. The City of San Jose's WPCP outfall discharges to Artesian Slough which flows into Coyote Creek. The Phase 1 action at Pond A16 would discharge water to Artesian Slough downstream of the WPCP outfall; however the discharge from this managed pond would not affect water levels or tidal flows upstream.

Alviso Phase 1 Actions Level of Significance: Less than Significant

Ravenswood. The Phase 1 action at Pond SF2 is not located in the vicinity of sewer force mains or outfalls and would result in negligible impacts.

Ravenswood Phase 1 Actions Level of Significance: No Impact

Phase 1 Impact 3.16-7: Disrupt Hetch Hetchy Aqueduct service so as to create a public health hazard or extended service disruption.

The following discussion evaluates potential impacts to the Hetch Hetchy Aqueduct at Pond SF2. The remaining Phase 1 locations are not located in the vicinity of the Aqueduct, and the effects of tidal breaching during Phase 1 would result in only negligible impacts.

Phase 1 No Action

The following discussion addresses the No Action Alternative (Alternative A) at the project level.

Continued pond management at Pond SF2 would not result in any changes to the Hetch Hetchy Aqueduct relative to baseline conditions. The No Action scenario assumes levees would deteriorate and eventually breach at several of the Phase 1 locations, but the effect of these ponds on the shoreline adjacent to the aqueduct would be negligible compared to large-scale restoration and climatic factors.

Phase 1 No Action Level of Significance: Less than Significant

Phase 1 Actions

The following discussion addresses the Phase 1 actions (the first phase of Alternatives B and C) at the project level.

Eden Landing. The Phase 1 actions in the Eden Landing pond complex are not located in the vicinity of the Hetch Hetchy Aqueduct and would result in negligible impacts.

Alviso. The Phase 1 actions in the Alviso pond complex are not located in the vicinity of the Hetch Hetchy Aqueduct and would result in negligible impacts.

Ravenswood. The Phase 1 action at Pond SF2 is located directly to the north of the Hetch Hetchy Aqueduct. The western span of the Aqueduct is located above ground along a pier and the managed pond restoration would not impact the integrity of the Aqueduct.

Phase 1 Actions Level of Significance: Less than Significant

Phase 1 Impact 3.16-8: Disruption of rail service due to construction of coastal flood levees and tidal habitat restoration.

Phase 1 No Action

The following discussion addresses the No Action Alternative (Alternative A) at the project level.

The No Action scenario assumes that no flood protection levees would be constructed in the vicinity of the UPRR. Therefore the UPRR near the community of Alviso and Pond A16 would not be affected.

Phase 1 No Action Level of Significance: No Impact

Phase 1 Actions

The following discussion addresses the Phase 1 actions (the first phase of Alternatives B and C) at the project level.

None of the Phase 1 actions include construction of a levee to provide flood protection or tidal habitat restoration adjacent to a rail line. Therefore, the Phase 1 actions would not adversely affect rail service.

Phase 1 Actions Level of Significance: No Impact

Phase 1 Impact 3.16-9: Reduced access to sewer force mains due to levee construction.

The following discussion evaluates potential impacts to access to sewer force mains due to levee construction at the Phase 1 locations. The only buried sewer force main within the SBSP Restoration Project Area is an approximately 3,000-ft (915-m) long section of the EBDA effluent disposal system along the northern portion of Pond E6A.

Phase 1 No Action

The following discussion addresses the No Action Alternative (Alternative A) at the project level.

The No Action scenario assumes no construction activity along the northern perimeter levee of Pond E6A, and therefore, no impact to access to sewer force mains is expected.

Phase 1 No Action Level of Significance: No Impact**Phase 1 Actions**

The following discussion addresses the Phase 1 actions (the first phase of Alternatives B and C) at the project level.

None of the Phase 1 actions include grading along the northern perimeter levee of Pond E6A. Therefore, the Phase 1 actions would not adversely impact access to sewer force mains.

Phase 1 Actions Level of Significance: No Impact

