

**INITIAL STUDY**  
**SAN FRANCISCO ESTUARY INVASIVE SPARTINA PROJECT**  
**California State Coastal Conservancy**

**Project Title: The San Francisco Estuary Invasive *Spartina* Project**

**Lead Agency Name and Address:**

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**Project Description**

**Project Background :**

Four species of invasive *Spartina*, commonly called cordgrasses, are rapidly spreading and establishing in the tidal marshes and mudflats of the San Francisco Estuary. First introduced twenty-five years ago, nonnative *Spartina alterniflora* has now spread to more than 1,000 net acres\*. Invasive *Spartina* can significantly alter the estuary both physically and biologically in ways which imperil the ecological balance and diversity of fragile habitats. Of primary concern is the potential of *S. alterniflora* to convert unvegetated tidal flats (mudflats) to vast, dense meadows of cordgrass. A large-scale, regional conversion of tidal flats will alter nutrient cycling within the estuary, and represent a regional loss of essential foraging habitat for shorebirds. A number of other impacts associated with the continued spread of invasive *Spartina* are also of concern. Research indicates that *S. alterniflora* and the common, native *Spartina foliosa* hybridize and if *S. alterniflora* populations are left unchecked, native *S. foliosa* will become locally extinct. The on-going spread of *S. alterniflora* is resulting in significant hydrologic alteration of salt marsh sloughs, creeks and flood control channels.

\* A net acre is a measure of the total square acres of invasive *Spartina* if scattered populations were compressed into one contiguous population.

The San Francisco Estuary Invasive *Spartina* Project is funded by grants from the CalFed Bay-Delta Ecosystem Restoration Program, California Coastal Conservancy, National Fish and Wildlife Foundation and the U.S. Fish and Wildlife Service Coastal Program.

Populations of invasive *Spartina* are directly and indirectly displacing native species in both the lower and upper marsh zones and marginalizing or eliminating endangered species habitat. Continued spread of *Spartina* hybrids will preclude the recovery of *Suaeda californica* a locally extirpated plant. Recovery of this endangered species is dependent on suitable habitat for recovery efforts within San Francisco Bay.

Significant efforts are underway to restore thousands of acres of land in the San Francisco Estuary to tidal marsh over the next few decades. These efforts are driven in part by regional efforts to improve the water quality of the Bay, prevent flooding, and recover essential habitat for native and endangered species. The continued spread of invasive *Spartina* threatens to undermine the success of meeting the intended objectives of these habitat restoration efforts by significantly altering the structure and composition of salt marshes and tidal flats. *Spartina* hybrids may also result in a significant sediment sink by trapping and stabilizing sediment which otherwise would be available for future restoration projects.

### **Project Purpose:**

The California State Coastal Conservancy established The San Francisco Estuary Invasive *Spartina* Project (Project), in 2000. The goal of the Project is to build a regionally coordinated effort aimed at the prevention, containment, methodical reduction, and where feasible, the eradication of four nonnative, introduced *Spartina* species throughout the San Francisco Estuary; *S. alterniflora*, *S. densiflora*, *S. anglica* and *S. patens*. The objectives of this project are to reverse the negative impacts associated with the spread of introduced *Spartina* on bayland habitats and to prevent further degradation of the rich biological resources of the ecosystem.

### **Project Location:**

Species of *Spartina*, in the San Francisco Estuary, grow within the intertidal zone. This zone is comprised of those areas subject to inundation by the tides ; tidal flats (mudflats, sandflats, and shellflats), tidal marsh and channels, lagoons, rocky shore (including rip rap), sandy shore and the saline reaches of rivers and creeks. Invasive *Spartina* can tolerate a wide range of salinities (1-35 ppt), from fresh water to full ocean salinity. Therefore, both salt and brackish marshes are subject to invasion.

The geographic scope of the Project includes the shoreline of ten Bay Area Counties, an area that correlates with the predicted, potential distribution range for invasive *Spartina* species within the San Francisco Estuary. Seven counties, Contra-Costa, Alameda, Santa Clara, San Mateo, San Francisco, Marin and Solano currently have populations of invasive *Spartina*. Napa, Sacramento and Sonoma will be routinely surveyed and monitored to prevent populations from establishing. Control efforts are anticipated in any county in which invasive *Spartina* is currently established or may, in the future, become established. The current distribution of the four invasive *Spartina* species within the San Francisco Estuary are shown in Figures 1 and 2.

In year 2000, the distribution of *Spartina alterniflora* extends from the most southern reaches of the South Bay to the North Bay (San Pablo Bay) . The largest infestations of *Spartina alterniflora* occur at a number of general sites within the Central and South Bays. These sites include

western Alameda Island and San Leandro Bay, the Hayward Regional Shoreline, Alameda Creek, the Alameda Flood Control Channel, and in San Bruno, just north of the San Francisco International Airport. At these locations, each population is greater than 50 net acres of *S. alterniflora*. Populations estimated between 10 and 50 net acres occur along the Oakland and Alameda Shoreline, the Don Edwards National Wildlife Refuge Newark area, Greco Island, and Bair Island. Smaller but significant, scattered populations occur at Richmond, Emeryville, Coyote Creek, Mowry Slough, Stevens Creek, Coyote Point vicinity, Candlestick Cove, Yosemite Channel, Tiburon and Richardson Bay. Isolated, small populations exist along the Eastshore State Park shoreline, Guadalupe Slough, Palo Alto Baylands, Corte Madera, and San Rafael. Scattered small populations can generally be found along most of the San Mateo and Alameda County shoreline. The greatest infestation of *Spartina densiflora* exists the length of Corte Madera Creek in Marin County. Populations of *S. densiflora* have also established in San Rafael, Tiburon, Pt. Pinole, and in Burlingame. *S. anglica* is found only at Creekside Park, Marin. *S. patens* is known to exist only in Benecia and near Tolay Creek.

### **Integrated Pest Management Program:**

The Project will utilize an Integrated Pest Management (IPM) approach. IPM is an approach to invasive weed problems that utilizes regular monitoring and record keeping to determine if and when control treatments are needed. IPM employs a combination of strategies and tactics to control or eradicate invasive weeds. By tailoring control techniques to specific sites resource managers can maximize control efficacy while minimizing negative environmental, economic and social impacts. Site specific combinations of cultural, physical, mechanical, educational and chemical control methods are used to solve a vegetation problem. Local conditions and precautions needed to protect sensitive species, human health and water quality and other concerns can be evaluated before, during and following the implementation of control measures. Only treatment methods that provide a long term net benefit to the habitat will be considered for use by the Project.

Potential treatment methods are summarized in Table 1 and include the following:

#### Physical Methods:

- Digging and Pulling
- Clipping seedheads to prevent pollination/seed dispersal
- Mowing with weed-eaters or amphibious mechanical cutters/mowers/shredders
- Prescribed burns
- Temporary diking of marshes
- Covering with geo-textile fabric or black plastic

#### Chemical Methods:

- Ground application of herbicide (via injection, backpack sprayer, spray truck, boat, all terrain vehicle)
- Aerial application of herbicide (helicopter)

Combination Methods:

- Mowing followed by herbicide application
- Mowing followed by burying, smothering, and mechanical trampling/shredding
- Mowing followed by covering (fabric/plastic)

The EIS/R will evaluate individual and cumulative impacts of four alternatives, as well as the no project/no action alternative, in accordance with NEPA and CEQA. The four alternatives will be developed in coordination with USFWS, CDFG, the Conservancy/ISP team, and private landowners with populations of *Spartina*.

Table

1 Summary of Removal Methods

Table 1, page 2

Figure

1            Distribution of *Spartina alterniflora*

*Figure*

2                    Distribution of *Spartina densiflora*, *Spartina anglica*, and *Spartina patens*

Bio-control Methods:

- Bio-control methods will not be considered for use by the Project. Biological control agents with potential for controlling invasive *Spartina* would cause probable harm to the native *Spartina foliosa* due to the close genetic relationship of these species.

**Surrounding Land Uses:**

The San Francisco Bay Estuary is surrounded by intensely urbanized commercial, industrial, residential, and open space lands. San Francisco International Airport as well as the Oakland, Hayward, San Carlos, and Palo Alto airports are located around San Francisco Bay, as are the ports of Oakland, San Francisco, Redwood City, and Richmond.

**Potentially Required Agency Approvals:**

- U. S. Army Corps of Engineers 404 and Section 10 permits of the Rivers and Harbor Act and Section 404 of the Federal Clean Water Act;
- Federal and State Endangered Species Act Consultations;
- California State Coastal Conservancy Plan approval;
- California Department of Transportation (Caltrans) Encroachment Permit(s);
- California Department of Fish and Game Streambed Alteration Agreements(s), Section 1601 of the DFG code;
- California State Regional Water Quality Control Board 401 Certification and/or Discharge Permit (s);
- California State Bay Area Air Quality Management District Permit (s);
- San Francisco Bay Conservation and Development Commission permit (s);
- Local agency approval of specific implementation of projects (s);

**Environmental Factors Potentially Affected**

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a “Potentially Significant Impact” as indicated by the checklist on the following pages. An EIS/ EIR will be prepared to address the identified potentially significant impacts.

<u>  X  </u> Aesthetics	<u>      </u> Agricultural Resources	<u>  X  </u> Air Quality
<u>  X  </u> Biological Resources	<u>  X  </u> Cultural Resources	<u>  X  </u> Geology/ Soils
<u>  X  </u> Hazardous Materials	<u>  X  </u> Hydrology/ Water Quality	<u>  X  </u> Land Use/ Planning
<u>      </u> Mineral Resources	<u>  X  </u> Noise	<u>      </u> Transportation
<u>      </u> Public Services	<u>  X  </u> Recreation	
<u>      </u> Population/ Housing	<u>      </u> Utilities/ Service Systems	

**MANDATORY FINDINGS OF SIGNIFICANCE**

On the basis of the initial evaluation:

\_\_\_\_\_ I find that the proposed project COULD NOT have a significant effect on the environment and a NEGATIVE DECLARATION will be prepared.

\_\_\_\_\_ I find that although the proposed project could have a significant effect on the environment there will not be a significant effect because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.

\_\_\_\_\_ I find that the proposed project MAY have a significant effect on the environment, and ENVIRONMENTAL IMPACT REPORT is required.

\_\_\_\_\_ I find that the proposed project MAY have a “potentially significant impact” or “potentially significant unless mitigated” impact on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

\_\_\_\_\_ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Printed Name

\_\_\_\_\_  
For

## EVALUATION OF ENVIRONMENTAL IMPACTS

### 1. AESTHETICS

Would the project:	Potentially Signif. Impact	Less Than Signif. w/ Mitig.	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Have a substantial adverse effect on a scenic vista?	X				
b. Substantially damage scenic resources, including, but not limited to trees, rock outcroppings, and historic buildings within a state scenic highway?			X		
c. Substantially degrade the existing visual character or quality of the site and its surroundings?	X				
d. Create a new source of substantial light or glare, which would adversely affect day or nighttime views in the area?				X	

#### Environmental Setting:

Heavy urbanization and industrial uses currently characterize the Bay Area, although major portions of the area around San Francisco Bay remain undeveloped.

Many recreational users of the region's waterfront, including birders, bicyclists, joggers and pedestrians, value the aesthetic of the Bay edge. Open space views of tidal flats and salt marshes in many areas around the bay afford spectacular views of wildlife and afford long distance views otherwise unavailable in a dense, urban setting. To the unknowing observer a marsh of non-native vegetation may rank as visually pleasing as a native one although composed of very different looking vegetation. An abundance of *S. alterniflora* is located on the eastern side of San Francisco Bay, along areas of intertidal flats and salt ponds. Native species of the marsh and mudflats include pickleweed and *Spartina foliosa*. These low growing species generally reach a height of 1 to 3 feet. *Spartina alterniflora* and hybrids generally reaches a height of 4 to 5 feet, overshadowing the native species. In addition, *Spartina alterniflora* grows in dense patches which displace native species and can visually dominate the character of a marsh.

**Impact Discussion:**

a. *Have a substantial adverse impact on a scenic vista? - PS*

In most areas of low to medium infestation in the Bay, the visual appearance of native marshes would be restored without significantly altering the visual character of the marshes. Tidal flats would be restored to their natural unvegetated state. In areas of medium to heavy infestation, where invasive *Spartina* has displaced the majority of native vegetation, control measures would have the potential to significantly change the visual character of the tidal wetlands. The character of these areas would change from relatively tall (4-6 ft) densely vegetated areas to sparsely vegetated or unvegetated areas temporarily. These changes would be most dramatic when mowing was implemented. Herbicide treatment does not immediately remove vegetation. Stems die back over a period of months in a manner similar to that which naturally occurs each winter. This change would not create objectionable views, and it would be visually compatible with existing scenic vistas.

b. *Substantially damage scenic resources, including state scenic highways? - LS*

Implementation of the proposed project would remove invasive species from marshes and would not potentially damage scenic resources. The proposed project would control invasion of native vegetation by a non-native species. There are no designated state scenic highways in the immediate project area.

c. *Substantially degrade existing visual character or quality of the site? - PS*

Removal of *Spartina* by all control methods would remove tall, dense vegetation from tidal flats and wetland areas. The visual character of a site would therefore change over time. Depending on the control method, the removal would take differing amounts of time. Passive and active restoration, in selected areas, of native species would return sites to their natural condition. The alteration of the visual character of marshes due to *Spartina* control will be discussed in the EIS/ EIR.

d. *Create light or glare? - NI*

The activities associated with the proposed project would not introduce light and glare onto the project area, and the control of *S. alterniflora* would not introduce any physical structures or lighting into the project area.

## 2. AGRICULTURAL RESOURCES

Would the project:	Potentially Signif. Impact	Less Than Signif. w/ Mitig.	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				X	
b. Conflict with existing zoning for agricultural use, or a Williamson Act contract?				X	
c. Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?				X	

### Environmental Setting:

Although significant amounts of farmland are located in the Bay region, the areas affected invasive *Spartina* are not used for agriculture. Most of the irrigated agricultural land remaining in production in the Bay Area, occurs in Contra Costa, Solano, and Sonoma outside the immediate Bay Area counties (CALFED Bay-Delta Program EIS/ EIR). *Spartina* grows in intertidal flats and is not located in areas currently used or designated as farmland.

### Impact Discussion:

a. *Convert Prime Farmland to non-agricultural use? - NI*

Significant farmland is located adjacent to the Bay in Marin and Sonoma counties. However, *Spartina* removal would not result in the conversion of any prime farmland to non-agricultural use. Treatment areas are located in areas of the shoreline of the Bay that are subject to inundation by the tides. *Spartina* removal would not affect any prime farmland.

b. *Conflict with existing agricultural zoning or Williamson Act contract? - NI*

No agricultural resources would be affected by *Spartina* removal, as discussed above. Removal would not occur in areas zoned for agriculture or protected under Williamson Act contracts. There would be no conflicts with any adopted plans or the Williamson Act.

c. *Result in conversion of Farmland to non-agricultural use? - NI*

The proposed project involves removal of invasive weeds. As described above, this activity would not occur on farmland and would not convert existing marshland to any other type of use.

**3. AIR QUALITY**

<b>Would the project:</b>	<b>Potentially Signif. Impact</b>	<b>Less Than Signif. w/ Mitig.</b>	<b>Less Than Signif.</b>	<b>No Impact</b>	<b>Reviewed Under Previous Document</b>
a. Conflict with or obstruct implementation of the applicable air quality plan?	X				
b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	X				
c. Result in a cumulative considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	X				
d. Expose sensitive receptors to substantial pollutant concentrations?	X				
e. Create objectionable odors affecting a substantial number of people?			X		

**Environmental Setting:**

The project area generally has good air quality, due to its attainment of most ambient air quality standards. However, the San Francisco Bay Area Air Basin (SFBAAB) presently exceeds state standards for ground-level ozone and particulates (Particulate Matter less than 10 microns diameter [PM<sub>10</sub>]), and federal standards for ground-level ozone. These air quality conditions are the same in the north and south bay. Ozone concentrations are the highest during the warmer months. The Bay Area Air Quality Management District (BAAQMD) is responsible for regulating stationary sources of air emissions within the SFBAAB and sets guidelines to determine the significance of air quality impacts for CEQA purposes. The 1997 Clean Air Plan is used by the BAAQMD to address attainment of the state ozone standard.

**Impact Discussion:**

**a. Conflict with air quality plan? - PS**

The Bay Area is presently in non-attainment status for state and federal air quality standards. Violation of air quality standards, as discussed below, would potentially conflict with the 1997 Clean Air Plan. Impacts will be evaluated further in the EIS/ EIR.

**b.**     *Violate air quality standards? - PS*

Not all proposed control techniques have the potential to violate air quality standards. However, gas-powered mowers, chemical control using herbicides or surfactants, or prescribed burns, would include emissions of nitrogen oxides (NO<sub>x</sub>), reactive organic compounds (ROC), and PM<sub>10</sub>. Therefore, these activities have the potential to violate existing air quality standards. These impacts will be evaluated in the EIS/ EIR.

**c.**     *Result in cumulatively considerable air pollutants? - PS*

Due to the existing non-attainment status in the Bay Area, air emissions from the proposed project, when considered with the other existing and projected projects generating air pollutants, the proposed project could result in cumulatively considerable pollutants. This impact will be evaluated in the EIS/ EIR.

**d.**     *Expose sensitive receptors to substantial concentrations? - PS*

Sensitive receptors potentially affected by the Project include hospitals and residences within close proximity to areas infested with invasive *Spartina*. Drift of emissions associated with chemical spraying and burning would potentially affect these receptors. Impacts would be potentially significant and evaluated in further detail in the EIS/ EIR.

**e.**     *Create objectionable odors affecting significant number of people? - LS*

Chemical removal, burning, and decaying vegetation may generate some objectionable odors. However, given the limited extent of these control methods, impacts would be less than significant.

**4. BIOLOGICAL RESOURCES**

<b>Would the project:</b>	<b>Potentially Signif. Impact</b>	<b>Less Than Signif. w/ Mitig.</b>	<b>Less Than Signif.</b>	<b>No Impact</b>	<b>Reviewed Under Previous Document</b>
a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game, or U.S. Fish and Wildlife Service?	X				
b. Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	X				
c. Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	X				
d. Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	X				
e. Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	X				
f. Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	X				

**Environmental Setting:**

Bayland habitats can be categorized as being either subject to tidal action or diked (Goals Project, 1999). The primary habitats within tidal baylands include tidal flats, tidal marshes (saline and brackish), and lagoons. Diked baylands in the San Francisco Bay ecosystem were historically subject to tidal action but have been deprived of tidal action (in some cases for many decades) by man-made levees. Diked bayland habitats include diked wetlands (formerly tidal marshes; not used for agricultural purposes), managed marshes (managed for wildlife and waterfowl), and diked marsh (not actively managed for wildlife; occasionally used for

agriculture). Agricultural baylands are diked, formerly tidal marshes that are intensively used for agricultural activities including crop production and/ or grazing.

The Bay ecosystem is composed of many non-native plant and animal species, which have been introduced to the Bay through shipping activity since the late 1800's and into the present (Cohen and Carlton, 1995). The phytoplankton in the Bay is a community of diatoms, silicoflagellates, coccolithophores, cryptomonads, green algae, and dinoflagellates. Consumptive grazing by zooplankton and larger filter feeders, such as benthic invertebrates and fish, controls the phytoplankton population, as do variations in temperature, salinity, light, currents, river inflow, and nutrient availability (Cloern, 1982). Zooplankton abundance is highest in the shallow areas of the Bay, as this community is intrinsically coupled with its phytoplanktonic food source. The San Francisco Bay zooplankton is mainly a community of invertebrate larvae and copepods.

The abundance and distribution of adult benthic invertebrates in the Bay depends on tolerance of temporal fluctuations in salinity, substrate type, and the presence of competitive invasive species (Nichols and Patamat, 1988). Regions such as the Suisun Bay and North Bay, where there is seasonal freshwater input, are characterized by only a few species that are particularly tolerant of low salinity or large changes in salinity. This is the case for the Asian clam *Potamocorbula amurensis*, an opportunistic and competitive invasive species. The benthic community in deeper regions (high salinity with little freshwater input), such as Central Bay and South Bay, is similar to coastal muddy bottom marine communities.

The majority of the marine mammals in the San Francisco Bay are found in the Central Bay region near the Golden Gate. They also utilize intertidal mudflats throughout lower North Bay and upper South Bay as haulout sites. Common species include the California sea lion (*Zalophus californianus*), harbor seals (*Phoca vitulina*), and harbor porpoises (*Phocoena phocoena*). Marine mammals, such as the California sea lion and harbor seal, often use South Bay subregion intertidal mudflats as haulout sites. They are otherwise more commonly located in the Central subregion. Haulouts are particularly common in marsh areas adjacent to sloughs in South Bay (SFEI, 1999).

Common aquatic birds in San Francisco Bay are cormorants, gulls, scoters, scaups, grebes, and others. Large concentrations of diving ducks use the open bay and some of the deeper salt ponds, while the dabbling ducks use the shallow intertidal mudflats and some of the shallow salt ponds.

### **Impact Discussion:**

- a. *Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game, or U.S. Fish and Wildlife Service? - PS*

The project has the potential to cause direct adverse impacts on federal and state listed special status species, including the salt marsh harvest mouse (*Reithrodontomys raviventris*), the California clapper rail (*Rallus longirostris obsoletus*), the California black rail (*Laterallus jamaicensis coturniculus*), and soft bird's beak (*Cordylanthus mollis*). Substantial habitat modifications are

anticipated in the tidelands that are heavily colonized by invasive *Spartina*. Impacts through habitat modifications would be potentially significant where control measures affect large areas that are used by sensitive species for life history activities such as cover, foraging, and breeding. These long-term impacts are potentially significant because it is not known how rapidly native marsh species would recover in treated areas and whether sensitive species would utilize areas where control measures have been applied. The project could also result in significant short-term impacts on sensitive species by interrupting breeding or foraging activities, and physical disturbance (e.g., trampling, noise, etc. from equipment and personnel) of occupied habitats.

Marine intertidal and subtidal organisms, such as several fish and invertebrate species, may be particularly sensitive to the proposed actions, as the removal of invasive *Spartina* may remove foraging, feeding, and breeding habitat. The winter run Chinook salmon, a federally listed threatened species, is potentially at risk, as are the forage fish populations and zooplankton it feeds on. Herbicide application may also adversely affect this species by effecting non-target plant species, such as the ecologically significant eelgrass or native cordgrasses. These impacts will be addressed in the EIS/ EIR.

- b. *Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service? - PS*

Due to the coexistence of non-native *Spartina* among remnant patches of native *S. foliosa* and large expanses of estuarine (pickleweed, *Salicornia virginica*) salt marsh, the project could result in potentially significant impacts on sensitive, native wetland communities. Over the long-term, the project is expected to benefit sensitive natural communities. Removing invasive *Spartina* will open up primary space (i.e. mudflats) and invaded areas for native salt marsh flora and fauna.

Chinook salmon utilize the eelgrass beds in the San Francisco Bay estuary for feeding, rearing, and shelter from larger predators. Removal of the invasive *Spartina* foliage using the proposed techniques (particularly burning and herbicide application) may inadvertently remove eelgrasses as well, causing an adverse effect on important habitat for chinook salmon and other marine species. One of the five proposed control methods, covering to prevent photosynthesis, may also have secondary effects on the intertidal habitat. Loss of photosynthesis and covering may promote anoxia in intertidal sediments, providing ideal conditions for the methylation of mercury to occur. Mercury is a major contaminant in San Francisco Bay, and its bacterially mediated transformation into the highly toxic and lipid soluble methyl form would add to the potential contamination of the San Francisco Bay food web. These impacts will be discussed in the EIS/ EIR.

- c. *Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? - PS*

Wetland habitats in the Bay are considered jurisdictional waters of the United States under Section 404 of the Clean Water Act (1972). The implementing regulations at 40 CFR Part 230 and 33 CFR Parts 320-331 require that a permit be issued by the Army Corps of Engineers (Corps) prior to discharges of dredged or fill materials into waters of the United States, including wetlands (defined at 33 CFR Part 328). In addition, lands subject to tidal action, such

as tidelands occupied by non-native *Spartina*, are also considered navigable waters under Section 10 of the Rivers and Harbors Act (1899); thus structures or work in navigable waters is also subject to authorization by the Corps. The proposed project could entail temporary diking which may require a permit from the Corps. Small scale excavation or digging of *Spartina* may require Army Corp permits. It is not anticipated that dredging would be required for any of the control methods. Over the long-term, the impact of non-native *Spartina* control measures are expected to benefit regulated waters of the United States and wetland habitats in the Bay. Removal of invasive *Spartina* will restore and increase flow capacity of many tidal channels and flood control channels. These impacts will be discussed further in the EIS/ EIR.

- d. *Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites? - PS*

Some of the control methods (i.e. mowing, burning) may have the potential to interfere with the movement of native resident and migratory wildlife in all intertidal zones including high marsh habitats, and impede the use of intertidal nursery habitats (see discussion of impacts on marine resources) if large areas of treated *Spartina* are left in place to decay. Mats of dead and decaying *Spartina* would potentially temporarily preclude native marsh vegetation species (such as pickleweed and *S. foliosa*) from recolonizing rapidly and restoring suitable nursery habitats for native species. Aquatic and wildlife species that require substantial cover for foraging, nesting or other life history functions (such as California clapper rail and salt marsh harvest mouse) are also expected to be impacted since each alternative has the potential to remove native [pickleweed] and non-native [*Spartina*] cover, refuge, and foraging areas. Both resident and migratory fishes, such as the Chinook salmon and its prey items, utilize cordgrass and eelgrass beds for feeding, foraging, and rearing. These beds also serve as shelter for juveniles to avoid larger, deep-water predators. Migration patterns of these fishes and the forage fish (prey) populations may be altered, as fish would lose vital cover and habitat, albeit temporary. These impacts will be discussed further in the EIS/ EIR.

- e. *Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? - PS*

The project is not expected to conflict with local policies or ordinances protecting biological resources, except in those communities that have policies regarding prohibitions on use of herbicides. The potential conflicts with local policies or ordinances related to the use of herbicides will be discussed further in the EIS/ EIR.

- f. *Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? - PS*

Control or eradication of Invasive *Spartina* would benefit the San Francisco Bay ecosystem by removing a non-native invasive species thereby ensuring the continued survival of native plant species along San Francisco Bay. This would be consistent with habitat conservation plans that encourage the continuance of native species throughout the Bay Area. The proposed *Spartina* Control Program is expected to implement the regionally adopted Invasive *Spartina* Program, which over the long-term would benefit the San Francisco Bay ecosystem. Chemical control

techniques would not be consistent with policies prohibiting the use of herbicides. This will be evaluated further in the EIS/ EIR.

**5. CULTURAL RESOURCES**

<b>Would the project:</b>	<b>Potentially Signif. Impact</b>	<b>Less Than Signif. w/ Mitig.</b>	<b>Less Than Signif.</b>	<b>No Impact</b>	<b>Reviewed Under Previous Document</b>
a. Cause a substantial adverse change in the significance of a historical resource as defined in '15064.5?				X	
b. Cause a substantial adverse change in the significance of an archaeological resource pursuant to 15064.5?	X				
c. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?			X		
d. Disturb any human remains, including those interred outside of formal cemeteries?	X				

**Environmental Setting:**

The San Francisco Bay marks the division between the North and South Coast ranges. This region of central California is characterized by a variety of ecological settings and has a long history of human occupation ranging from 10,000 B.C. to the present. Areas used by the native populations during the prehistoric period included bayshore, estuary, and riparian settings; valley floor and associated wetlands; riverine and upland areas. After B.C. 2000, settlement and subsistence revolved more heavily around bayshore and marsh habitats (Moratto 1984). Prehistoric site types recorded in the Bay Area include village sites, temporary campsites, milling sites, petroglyphs, lithic scatters, quarry sites, shell and ash middens, and burial sites.

**Impact Discussion:**

- a. *Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section '15064.5? - NI*

Proposed removal methods would target invasive *Spartina* and would not affect aboveground structures. No impacts on historical resources would occur.

- b. *Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section '15064.5? - PS*

The largest amount of ground disturbance would be associated with digging, which could remove a substantial portion of soil associated with the root system. Larger plants can have underground parts extending as much as 1.2 m (4 ft) below the soil surface, and removing a one-square meter (10.8 sf) patch of *S. alterniflora* by digging might require removal of wet mud

weighing more than 1 metric ton (1.1 tons). Depending on their age, buried archaeological sites could be located in the soil to this depth. The size of archaeological sites can vary from several thousand square feet to several acres. The potential for impacting archaeological resources would generally increase with the number of plants that would be removed, as the extent of disturbed ground surface would be expanded. Cultural resources located in areas where digging would occur would potentially become damaged or destroyed. In some cases, plant removals within a concentrated area could result in the destruction of an entire archaeological site, or the destruction of a substantial portion of a larger archaeological site. Although only a few archaeological sites would potentially be impacted in any one restoration area, the incremental destruction of the non-renewable cultural resources within the program's jurisdiction over time would be potentially widespread. Impacts on cultural resources would be potentially significant and will be addressed further in the EIS/ EIR.

- c.**     *Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?*  
- **LS**

Paleontological resources would not be expected within marshland areas. Removal of soil to a depth of up to 1.2 meters would alter local topography. However, these changes would not be of sufficient magnitude to alter geologic features.

- d.**     *Disturb any human remains, including those interred outside of formal cemeteries?* - **PS**

Human remains associated with archaeological sites would potentially be disturbed, similar to the potential for removing archaeological sites described under (a). Impacts would be potentially significant and addressed further in the EIS/ EIR.

**6. GEOLOGY AND SOILS**

<b>Would the project:</b>	<b>Potentially Signif. Impact</b>	<b>Less Than Signif. w/ Mitig.</b>	<b>Less Than Signif.</b>	<b>No Impact</b>	<b>Reviewed Under Previous Document</b>
a. Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:			X		
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.				X	
ii) Strong seismic ground shaking?				X	
iii) Seismic-related ground failure, including liquefaction?				X	
iv) Landslides?				X	
b. Result in substantial soil erosion or the loss of topsoil?	X				
c. Be located on a geological unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?			X		
d. Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994) creating substantial risks to life or property?				X	
e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?				X	

**Environmental Setting:**

The San Francisco Bay and the Bay Area are located within the Coast Ranges Geomorphic Province of California, which is characterized by a system of northwest-southeast trending longitudinal mountain ranges and valleys that are controlled by faulting and folding. The Bay itself started to form in the Late Pleistocene due to subsidence associated with localized oblique displacements on the San Andreas and Hayward faults. Flooding of the area occurred several times with Pleistocene sea level fluctuations.

The San Francisco Bay/ Delta estuarine system drains over 40 percent of the land area in the state of California. Shoaling of navigation channels results from a combination of new sediments entering the system (primarily from the Sacramento/ San Joaquin rivers) and resuspension of existing sediment resulting from fluvial, tidal, and wind-driven waves and currents. Annual amounts of new and resuspended sediments for the entire San Francisco Bay Area are estimated to be 8 million cubic yards (mcy) and 100 mcy, respectively.

The San Francisco Bay Area is well known as a seismically active region. Historically, numerous moderate-to-strong earthquakes are related to the San Andreas and Hayward fault systems. The Bay Area fault system is composed of four major faults: the San Andreas fault, the Northern and Southern segments of the Hayward fault, and the Concord and Calaveras faults. Combined the probability of an earthquake of magnitude 7 (M7) or greater occurring on one of these faults between 1990 and 2020 has been estimated at 67 percent.

Topography controls the distribution of water and sediment. The topography of tidal baylands determines the frequency and duration of tidal inundation and where the tides go. The topography of diked baylands and adjacent uplands affects runoff and groundwater recharge. Slight variations in topography can have ecologically significant effects on the distribution of water on the ground surface. Like climate, topography changes slowly, except for the local effects of floods, landslides, earthquakes, and people.

The slope of the terrain near the Estuary strongly influences the width of local baylands. In areas where the shoreline is steep, as in many parts of Central Bay and along the Carquinez Strait, the baylands are restricted to narrow fringes bordering deeper water. In areas where the terrain is flatter, as in much of South Bay, North Bay, and Suisun, the baylands are broader.

### **Impact Discussion:**

- a.** *Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving: - LS*
  - i) Rupture of a known earthquake fault?*
  - ii) Strong seismic ground shaking?*
  - iii) Seismic-related ground failure, including liquefaction?*
  - iv) Landslides?*

The proposed project would require the use of personnel and vehicles to accomplish the control program in a seismically active region. A small number of people and vehicles would be used intermittently to implement the Invasive *Spartina* program. The potential for substantial injury or death would be low, because of their location away from buildings and other structures during the *Spartina* control activities. Additionally, the proposed removal methods would not contribute to increased hazards in the event of an earthquake. No structures are located in the areas of proposed *Spartina* removal. In addition, no structures are proposed that would be subject to the effects of an earthquake.

- b.** *Result in substantial soil erosion or the loss of topsoil? - PS*

The potential for soil erosion or loss of topsoil varies, depending on the method or methods used to control *Spartina*. Some of the control techniques may result in areas bare and prone to

short-term erosional impacts. Several of the techniques considered leave root structures intact thereby reducing the potential for erosion. Potential soil erosion impacts are discussed further in Section 8, Hydrology and Water Quality. These impacts will be evaluated in the EIS/ EIR.

- c. *Be located on a geological unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse? - **LS***

The proposed project does not include structural development. An earthquake, however, would cause lateral spreading and subsidence throughout the tidelands that could adversely affect persons or equipment working on-site during such an earthquake. Although erosion could result from removal of vegetation, as discussed under (b), removal of plants and associated topsoil would not be at volumes large enough to result in increased hazards of landslides, subsidence, liquefaction, or collapse.

- d. *Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994) creating substantial risks to life or property? - **NI***

The proposed project does not include development of structures that would potentially be placed on expansive soils. No impacts would occur.

- e. *Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater? - **NI***

No septic tanks or waste water systems are proposed or would be required for the proposed project.

## 7. HAZARDS AND HAZARDOUS MATERIALS

Would the project:	Potentially Signif. Impact	Less Than Signif. w/ Mitig.	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	X				
b. Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	X				
c. Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	X				
d. Be located on a site that is included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5; and, as a result, would it create a significant hazard to the public or the environment?	X				
e. For a project located within an airport land use plan, or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport; would the project result in a safety hazard for people residing or working in the project area?	X				
f. For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?			X		
g. Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X	
h. Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?			X		

### Environmental Setting:

The project includes numerous sites around San Francisco Bay. Potential project activities at these sites include use of herbicides and surfactants in wetlands and intertidal mudflats of the

San Francisco Bay Estuary. At least three schools are located within 0.25 mile of one or more project sites, including Garfield Elementary in San Leandro, La Escuelita Elementary and Laney College in Oakland, with others located 0.25 to 0.5 mile from one or more sites.

Some project sites may be located at or near various known hazardous waste sites, e.g., the Hunters Point Annex (a National Priorities List hazardous waste site) in San Francisco, Cooley Landing Salt Pond restoration site near East Palo Alto, and various sites in and adjacent to San Leandro Bay.

At least six public airports are located within 2 miles of one or more project sites: San Francisco International Airport, Metropolitan Oakland International Airport, Hayward Air Terminal, San Carlos Airport, Palo Alto Airport, and Seaplane Harbor in Alameda. Although no private airstrips are known to lie within 2 miles of any sites, several private airstrips are located in the general vicinity. Seaplanes sometimes land in undesignated locations of the Bay, but no designated public or private seaplane landing facilities are known within 2 miles of any site except Seaplane Harbor in Alameda.

**Impact Discussion:**

- a. *Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials? – PS*

All potentially significant hazards to the public or the environment which may arise from the application of herbicides (Rodeo, Sonar, Arsenal) and surfactants to control or eradicate *Spartina* will be evaluated in the EIS/ EIR. Rodeo has been used elsewhere to control noxious aquatic vegetation. Glyphosate, the active ingredient in Rodeo, is a non-selective, post-emergent herbicide that must be applied with an inactive surfactant that promotes penetration of the herbicide into the waxy cuticle of the plant. Product information indicates that glyphosates have low toxicity to aquatic organisms, are not expected to bioaccumulate, are rapidly biodegraded in water, and have strong affinities for particles with low potential for migration to groundwater. The residence time of glyphosate in sediment is considerably longer than in water. At present, disagreements exist concerning the toxicity of glyphosate plus surfactants to aquatic organisms. Fluridone (Sonar) and Imazapyr (Arsenal) similarly are only slightly toxic to animals, are not persistent in the environment, and do not bioaccumulate.

Any potential adverse effects on fishes in San Francisco Bay will be evaluated in the EIS/ EIR. Herbicides may be used on non-submerged vegetation. Indirect impacts due to spray drift and runoff will be evaluated as well as the decomposition of vegetative matter which may result in the a reduction or depletion of dissolved oxygen.

Mitigation measures which will greatly reduce impacts to sensitive resources are all-important in this control project. Factors that are important to mitigation of potentially significant hazards to the public or the environment include timing of herbicide use (e.g., endangered species reproductive cycles, thresholds of disturbance, weather conditions, avoidance of treatment during high public use days), area of treatment ( vicinity to schools), and site specific control technique(e.g., physical, chemical or combination).

- b. *Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment? - PS*

Both direct and indirect human exposures could occur due to the routine use and/ or accidental release of herbicides and surfactants. Aerial application could result in transport of herbicides offsite, and potential exposure of downwind populations/ visitors via inhalation and dermal contact pathways. Food chain exposures to herbicides (i.e., due to bioaccumulation of contaminants in fish or shellfish) are unlikely, however, exposure during recreational fishing/ harvesting activities could occur. Improper disposal of herbicides could also result in potentially significant hazards to the public or the environment. Impacts on human health from the herbicides under consideration are not likely to be significant if appropriate mitigation measures are employed.

- c. *Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? - PS*

At least three schools are located within 0.25 mile of one or more project sites, including Garfield Elementary in San Leandro, La Escuelita Elementary and Laney College in Oakland, with others located 0.25 to 0.5 mile from one or more sites. Both direct and indirect human exposures could occur through the routine use and/ or accidental release of herbicides and surfactants. Impacts on human health, however, are not likely to be significant if appropriate mitigation measures are employed. Potentially significant impacts will be evaluated in the EIS/ EIR.

- d. *Be located on a site that is included on a list of hazardous material sites compiled pursuant to Government Code Section 65962.5; and, as a result, would it create a significant hazard to the public or the environment? – PS*

Some project sites may be located at or near various known hazardous waste sites, e.g., the Hunters Point Annex (a National Priorities List hazardous waste site) in San Francisco, Cooley Landing Salt Pond restoration site near East Palo Alto , and various hazardous waste sites in and adjacent to San Leandro Bay. Potential impacts of herbicide application in these areas on public health and safety or the environment will be evaluated in the EIS/ EIR.

- e. *For a project located within an airport land use plan, or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport; would the project result in a safety hazard for people residing or working in the project area? - PS*

At least six public airports are located within 2 miles of one or more project sites: San Francisco International Airport, Metropolitan Oakland International Airport, Hayward Air Terminal, San Carlos Airport, Palo Alto Airport, and Seaplane Harbor in Alameda. Herbicide application could potentially occur within an airport land use plan or within 2 miles of an airport. Such application potentially could have an adverse effect on people residing or working in the area. . Impacts on human health from the herbicides under consideration are not likely to be significant if appropriate mitigation measures are employed. Potential impacts of herbicide application on public health and safety will be evaluated in the EIS/ EIR.

- f. *For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area? - LS*

No private airstrips are known to lie within 2 miles of any project site. For private airstrips at distances greater than 2 miles, it is unlikely that project activities would result in a safety hazard due to the short duration of project activities. All equipment, personnel, and project activities would be located outside of any private airstrip property.

- g. *Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? - NI*

Activities would not impair implementation of or physically interfere with any emergency response or evacuation plans.

- h. *Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands? - LS*

The herbicides/ surfactants proposed for use are not flammable, and would not result in significant impacts due to wildland fires. The proximity of the properties to water would substantially reduce the potential for any wildland fires from controlled burns.

## 8. HYDROLOGY AND WATER QUALITY

Would the project:	Potentially Signif. Impact	Less Than Signif. w/ Mitig.	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Violate any water quality standards or waste discharge requirement?	X				
b. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?			X		
c. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	X				
d. Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?			X		
e. Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?			X		
f. Otherwise substantially degrade water quality?			X		
g. Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?			X		
h. Place within a 100-year flood hazard area structures that would impede or redirect flood flows?			X		
i. Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?			X		
j. Inundation by seiche, tsunami, or mudflow?			X		

## **Environmental Setting:**

### ***Hydrology***

The northern reach of the San Francisco Bay (comprising Suisun Bay, Carquinez Strait, and San Pablo Bay) is geographically and hydrologically distinct from the Central and South bays. South Bay is a tidally oscillating, lagoon-type estuary, where variations are determined by water exchange between the northern reach and the ocean. Water residence times are much longer in South Bay than in North Bay. The northern reach is a partially-to-well-mixed estuary (depending on the season) that is dominated by seasonally varying river inflow. The timing and magnitude of the highly seasonal river inflow modulates permanent estuarine circulation, which is largely maintained by salinity-controlled density differences between river and ocean waters.

Freshwater inflows, tidal flows, and their interactions largely determine variations in the hydrology of the Bay/ Delta. Hydrology has profound effects on all species that live in the Bay/ Delta because it determines the salinity in different portions of the Estuary and controls the circulation of water through the channels and bays. Circulation patterns within the Bay are influenced by Delta inflows, gravitational currents, and tide- and wind-induced horizontal circulation. The cumulative effects of the latter three factors on net circulation within embayments tend to dominate over that of freshwater inflows except during short periods after large storm events (Smith 1987). Exchanges between embayments are influenced both by mixing patterns within embayments and by the magnitude of freshwater inflows (Smith 1987).

### ***Water Quality***

The primary water quality parameters include salinity, dissolved oxygen, pH, total suspended solids (TSS), turbidity, and pollutants.

#### ***Salinity***

The salinity of water entering the Estuary varies greatly. The Sacramento River and eastside streams flowing into the Delta are low in salts, with salinity averaging less than 0.1 parts per thousand (ppt). San Joaquin River water is more saline than these tributaries and, since the 1930s, its average salinity has increased from less than 0.2 ppt to about 0.4 ppt, primarily as a result of increased agricultural drainage. Seasonal changes in the salinity distribution within the Estuary are controlled mainly by the exchange of ocean and Bay water, and by river inflow. River inflow has the greater influence on salinity distribution throughout most of the Estuary because inflow varies widely, while variations in ocean inputs are relatively small.

#### ***Dissolved Oxygen***

The Estuary's waters are generally well oxygenated, except during summer in the extreme southern end of South Bay where concentrations are reduced by poor tidal mixing and high water temperature. Typical concentrations of DO range from 9 to 10 mg/ l throughout the entire Estuary during periods of high riverine flow, 7 to 9 mg/ l during moderate riverine flow, and 6 to 9 mg/ l during the late summer months when flows are the lowest. Today, the lowest concentrations in the Estuary are typically observed in the extreme South Bay but, in some

instances, DO levels in semi-enclosed embayments such as Richardson Bay can be much lower than in the main water body (SFEI 1994).

### *pH*

The pH of waters in San Francisco Bay is relatively constant and typically ranges from 7.8 to 8.2.

### *Total Suspended Solids and Turbidity*

Turbidity and total suspended solids (TSS) are generally used as measures of the quantity of suspended particles. The distinction lies mainly in the method of measurement; i.e. turbidity measurements are optical, while TSS measurements are gravimetric. In general, higher TSS results in more turbid water. TSS levels in the Estuary vary greatly depending on the season, ranging from 200 mg/ l in the winter to 50 mg/ l in the summer (Nichols and Pamatmat 1988; Buchanan and Schoellhamer 1995). Shallow areas and channels adjacent to shallow areas have the highest suspended sediment concentrations. TSS levels vary throughout the Estuary depending upon season, tidal stage, and depth (Buchanan and Schoellhamer 1995). Central Bay generally has the lowest TSS concentrations; however, wind-driven wave action and tidal currents, as well as dredged material disposal and sand mining operations cause elevations in suspended solids concentrations throughout the water column.

### *Pollutants*

Pollutant loading to San Francisco Bay has long been recognized as one of many factors that have historically stressed aquatic resources. Pollutants enter the aquatic system through atmospheric deposition, runoff from agricultural and urbanized land, and direct discharge of waste to sewers and from industrial activity.

The Bay's sediment can be both a source of and a sink for pollutants in the overlying water column. The overall influx of pollutants from the surrounding land and waste discharges can cause increases in sediment pollutant levels. Natural resuspension processes, biological processes, other mechanical disturbances, dredging, and sediment disposal can remobilize particulate-bound pollutants.

### *Sediment Quality*

Sediment quality in the Estuary varies greatly according to the physical characteristics of the sediment, proximity to historical waste discharges, the physical/ chemical condition of the sediment, and sediment dynamics that change with location and season. Generally, the level of sediment contamination at a given location will vary depending on the rate of sediment deposition, which varies with seasons and tides (Luoma et al. 1990). Chemical contaminant dynamics in an estuary are closely associated with the behavior of suspended and deposited sediments. Overall, the physical and chemical characteristics of sediments, and the bioavailability and toxicity of sediment-associated chemicals to aquatic organisms, are particularly important in determining their potential impact on environmental quality.

**Impact Discussion:**

- a. *Violate any water quality standards or waste discharge requirement? - PS*

The proposed project would not generate wastes that would be intentionally discharged to surface waters. Decaying vegetation may create a high oxygen demand and/or increased turbidity in adjacent waters, resulting in reduced water quality. Additionally, removal of marsh vegetation could disturb sediments, thereby causing remobilization of sediment-associated pollutants and potentials for bioaccumulation of chemical pollutants in organisms. Impacts may be potentially significant. Potentially significant impacts to water quality will be evaluated further in the EIS/ EIR.

- b. *Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)? - LS*

In general, the project is not expected to affect groundwater or aquifer levels because the project would not withdraw groundwaters. Also, groundwaters in the vicinity of the marsh treatment sites likely are brackish and nonpotable and unsuitable for irrigation. Thus, movement/ leaching of herbicides or remobilized contaminants is not expected to significantly affect groundwater quality.

- c. *Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site? - PS*

Removal of marsh vegetation, and/or disturbances to marsh sediments, could increase potentials for erosion and transport offsite of sediments to other areas that, in turn could affect marsh circulation or drainage patterns. Impacts would be potentially significant. This impact will be evaluated further in the EIS/ EIR. One intended goal of the proposed project is to preserve and restore natural drainage patterns.

- d. *Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site? - LS*

Some changes to surface drainage patterns in the marsh could occur in the vicinity of the treatment sites. However, the magnitude of these changes would not be substantial and would not result in flooding on or off-site.

- e. *Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff? - LS*

The proposed project would not increase runoff volumes or add pollutants to stormwater flows to the Bay. As mentioned, herbicides applied to target vegetation, as well as marsh sediments, could be transported off-site by tidal flows within the marsh. However, these processes would not add significantly to the flux of pollutants to the Bay.

- f. *Otherwise substantially degrade water quality? - LS*

Based on the above considerations, these potential impacts on water quality would be considered less than significant.

- g. *Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map? - LS*

No housing is proposed as part of the proposed project. Therefore, no impacts would result.

- h. *Place within a 100-year flood hazard area structures that would impede or redirect flood flows? - LS*

No structures would be constructed as part of the proposed project. Therefore, no impacts would result.

- i. *Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam? - LS*

Although some changes to surface drainage patterns in the marsh could occur in the vicinity of the treatment sites, these changes generally would not be expected to increase potentials for flooding in adjacent developed areas or expose people or structures to a significant risk of loss, injury or death as a result of the failure of a levee or dam.

- j. *Inundation by seiche, tsunami, or mudflow? - LS*

Although some changes to surface drainage patterns in the marsh could occur in the vicinity of the treatment sites, these changes generally would not be expected to increase potentials for inundation by seiche, tsunami, or mudflow.

**9. LAND USE AND PLANNING**

<b>Would the project:</b>	<b>Potentially Signif. Impact</b>	<b>Less Than Signif. w/ Mitig.</b>	<b>Less Than Signif.</b>	<b>No Impact</b>	<b>Reviewed Under Previous Document</b>
a. Physically divide an established community?				X	
b. Conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	X				
c. Conflict with any applicable habitat conservation plan or natural community conservation plan?	X				

**Environmental Setting:**

The project area includes the San Francisco Bay Estuary and, in particular, the tidelands located between developed areas and water. The land uses surrounding areas where *Spartina* grows within the San Francisco Estuary vary and include residential, open space, and industrial areas. *Spartina* in the North Bay grows adjacent to residential and open space areas in Corte Madera and at the head of Richardson Bay, and San Pablo Bay. *Spartina* is more widespread in the Central and South Bays and grows adjacent to a variety of land uses. It is found along the East Bay near the heavily industrialized Port of Oakland and Alameda Island. Further south, it is primarily located adjacent to salt evaporator ponds, which are open space areas with minimal development. A large portion of this area also falls within the San Francisco Bay National Wildlife Refuge. On the western shore of the bay, *Spartina* is found adjacent to industrialized areas, including the Port of Redwood City and San Francisco Airport. Residential areas, including the neighborhood north of 3Com Park, are also located along the bay shoreline where *Spartina* is found. Some of the areas around San Francisco Bay provide sensitive habitats that may be subject to Habitat Conservation Plans.

**Impact Discussion:**

a. *Would the project physically divide an established community? - NI*

The proposed project would not physically divide an established community. The proposed project would not alter existing or planned land uses and would not result in the development of any structures. The proposed action would only require occasional access to tideland areas by personnel and equipment. Therefore, impacts would not occur.

b. *Would the project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect? - PS*

The project will be conducted in close coordination with relevant federal, state, and local agencies. The nature of the proposed action is such that the particular method for *Spartina* removal (i.e., mechanical, manual, spraying, etc.) in a given area can be selected or rejected based on any restrictions presented by relevant plans, policies, or regulations. However, because of the number of jurisdictions affected by the proposed project, evaluation of relevant plans and policies will be undertaken in the EIS/ EIR to identify any conflicts and provide the opportunity for resolution prior to project initiation.

- c. *Would the project conflict with any applicable habitat conservation plan or natural community conservation plan? - PS*

It is not anticipated that the proposed project would conflict with any applicable habitat conservation plan or natural community conservation plan. The proposed action is intended to implement goals presented in habitat conservation and natural community conservation plans developed by several agencies with jurisdiction in the region. However, because of the number of jurisdictions affected by the program, the potential for conflict with these plans will be evaluated. The compatibility of the proposed project with these plans will be discussed in the EIS/ EIR.

**10. MINERAL RESOURCES**

<b>Would the project:</b>	<b>Potentially Signif. Impact</b>	<b>Less Than Signif. w/ Mitig.</b>	<b>Less Than Signif.</b>	<b>No Impact</b>	<b>Reviewed Under Previous Document</b>
a. Result in the loss of availability of a known mineral resource that would be of value to the region and residents of the state?				X	
b. Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				X	

**Environmental Setting:**

A number of mineral resources are present in the San Francisco Bay Area. Salt and sand is currently produced. The Cargill Salt Company produces salt from evaporation ponds located along the southeastern margin of the bay in Alameda County. Hanson Aggregates and RMC Pacific Materials currently dredge sand from the bay in the vicinity of Alcatraz Island. Salt ponds total some 36,000 acres in South Bay and some 10,000 acres in North Bay.

**Impact Discussion:**

- a. *Result in the loss of availability of a known mineral resource that would be of value to the region and residents of the state? - NI*

The proposed project would not compromise the availability of any known mineral resources. Removal of *Spartina* would occur adjacent to salt evaporator ponds in South Bay. However, removal activities would be restricted to marshes and would not interfere with salt or sand production.

- b. *Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan? - NI*

The salt ponds are an economically important and productive use of the waters of the Bay (for extracting salt), and the salt is an important raw material for the Bay Area chemical industry. However, neither salt nor sand production would be compromised by the proposed project, as discussed above. Removal of *Spartina* would not affect the availability of important mineral resources.

**11. NOISE**

Would the project result in :	Potentially Signif. Impact	Less Than Signif. w/ Mitig.	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance or applicable standards of other agencies?	X				
b. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	X				
c. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?			X		
d. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	X				
e. For a project located within an airport land use plan, or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?			X		
f. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?			X		

**Environmental Setting:**

The noise environment surrounding marsh treatment sites vary due to the widespread distribution of *Spartina* in the Estuary. The open space nature of the marsh treatment sites results in few noise-producing activities at the sites themselves. The noise environment is primarily influenced by off-site noise generators. Ambient noise levels vary from above 65 dBA in marshes adjacent to industrial developed areas, such as the ports of Oakland and Redwood City and the San Francisco Airport, to below 45 dBA in areas of the San Francisco Bay Refuge Complex and marshes that are surrounded by salt evaporator ponds.

The number and type of noise sensitive receptors vary with the location. However, receptors include residences, schools, and hospitals that are within 1,600 feet of the treatment sites.

**Impact Discussion:**

- a. *Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance or applicable standards of other agencies? - PS*

Temporary increases in noise levels would result from increased human presence in marsh areas during removal activities. Up to five people may be present at the site over a period of days. Use of mechanized equipment, including boats and aircraft at selected site could contribute to increased noise levels of up to 65 dBA within 1,600 feet of treatment areas. Impacts would be potentially significant and would be discussed in further detail in the EIS/ EIR.

- b. *Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels? - PS*

Sensitive receptors, including residences, schools, and hospitals, located within 1,600 feet of removal activity could be subjected to increased noise levels of up to 65 dBA as discussed above. Impacts would be potentially significant and would be discussed in further detail in the EIS/ EIR.

- c. *A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project? - LS*

Removal activities would occur over a limited duration, from one day to a period of weeks. Periodic monitoring of the sites would be conducted, although the presence of a monitor evaluating the presence of invasive *Spartina* through personal observations would not result in substantial noise-generating activity. Therefore, no permanent increases in ambient noise levels would occur.

- d. *A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project? - PS*

As discussed under (a) and (b), removal activities could result in temporary increases in noise levels. Impacts would be potentially significant and discussed in further detail in the EIS/ EIR.

- e. *For a project located within an airport land use plan, or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels? - LS*

Some control activities would take place adjacent to San Francisco International and Oakland airports. These activities would not expose residents or workers in these areas to excessive noise levels. Control activities would result in temporary increases to noise levels, but not excessive levels over time. All removal activities would be coordinated with applicable airport land use plans.

- f. *For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels? - LS*

The proposed project would not be located within the vicinity of a private airstrip.

**12. POPULATION AND HOUSING**

<b>Would the project:</b>	<b>Potentially Signif. Impact</b>	<b>Less Than Signif. w/Mitig.</b>	<b>Less Than Signif.</b>	<b>No Impact</b>	<b>Reviewed Under Previous Document</b>
a. Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				X	
b. Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X	
c. Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X	

**Environmental Setting:**

According to Association of Bay Area Governments (ABAG) data, the nine-county San Francisco Bay Area had an estimated population of 6.9 million persons in 2000. The Bay Area population is projected to increase to 7.6 million by 2010 and to 8.0 million by 2020. ABAG estimates the number of Bay Area households at 2.4 million in 2000. The number of households is projected to increase to 2.7 million by 2010 and to 2.8 million by 2020. (ABAG 1999)

**Impact Discussion:**

a. *Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)? - NI*

The proposed project does not include any new homes, business, or roads. No development would occur that would induce population growth and associated housing.

b. *Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere? - NI*

No demolition of housing would occur as a result of removal activities. The project would be conducted in areas devoid of housing. Therefore, displacement of housing would not occur. Indirect impacts on residential areas elsewhere would not be expected to occur. No impacts would result.

c. *Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere? - NI*

The proposed project area includes tidelands with minimal to no population and no structures. Displacement of people would not occur as a result of the proposed project.

**13. PUBLIC SERVICES**

<b>Would the project:</b>	<b>Potentially Signif. Impact</b>	<b>Less Than Signif. w/ Mitig.</b>	<b>Less Than Signif.</b>	<b>No Impact</b>	<b>Reviewed Under Previous Document</b>
a. Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:					
Fire protection?			X		
Police protection?				X	
Schools?				X	
Parks?	X				
Other public facilities?				X	

**Environmental Setting:**

Various departments within the cities and counties of the Bay region provide fire protection, police protection, and emergency medical services to members of their respective communities.

**Impact Discussion:**

- a. *Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:*

*Fire Protection? - LS*

The proposed project includes controlled burns as a method of removal. Participation of the fire department may be required to ensure that activities would not result in public safety hazards. Since the marsh treatment sites are dispersed throughout the bay, demands on fire department personnel would be spread among a number of fire departments and would not excessively burden any one station. This would allow fire departments to maintain acceptable service ratios while addressing the needs of the proposed project.

*Police protection? - NI*

The proposed project would not require police services. No impacts would occur.

*Schools? - NI*

No schools are located along the shoreline, but some are in the immediate vicinity of the project area. The proposed project, however, would not lead to population increases and associated student generation.

*Parks? - PS*

A number of local and state parks and are located within the Bay Estuary. Many removal sites are adjacent to the Bay Trail. Removal activities could temporarily constrain access to these parklands and to some trails. Depending on the length of time such constraints occurred, impacts could be potentially significant. Please see Section 14, Recreation, for additional detail. This issue will be discussed further in the EIS/ EIR.

*Other public facilities? - LS*

The activities associated with the control of Spartina would not adversely affect public facilities because of the small number of persons and vehicles undertaking these activities and the intermittent nature of the activities. The potential for the proposed project to have adverse impacts on public services would be less than significant.

**14. RECREATION**

<b>Would the project:</b>	<b>Potentially Signif. Impact</b>	<b>Less Than Signif. w/ Mitig.</b>	<b>Less Than Signif.</b>	<b>No Impact</b>	<b>Reviewed Under Previous Document</b>
a. Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	X				
b. Include recreation facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?				X	

**Environmental Setting:**

Recreational facilities surrounding the Bay provide a variety of activities. Recreational demand in the Bay area has resulted in development of parks, marinas, launching ramps, fishing piers, and beaches.

Proposed treatment areas are located in the tidelands, which are generally not accessible to the public for recreational use. However, these sites abut recreational areas adjacent to the estuaries, although most project locations are generally not considered recreational areas themselves. Several treatment sites are located within the East Bay regional Parks District, including Crown Beach, Martin Luther King Jr. Park, Oyster Bay, Hayward Shoreline, and Coyote Hills parks.

**Impact Discussion:**

- a. *Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated? - PS*

The proposed project may affect park use at selected sites during application of control methods by means of temporary trail closures and other access roads. Removal activities may constrain access, as portions of parks may be inaccessible while removal methods that could potentially affect public safety (chemical use, burning) are applied. Some techniques could be applied over a period of days with access being constrained commensurately. This would be a potentially significant impact and will be discussed further in the EIS/ EIR.

- b. *Include recreation facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment? - NI*

The project does not propose to construct or modify existing recreational facilities. As discussed above, removal activities could occur adjacent to parkland. No population increases are associated with the proposed project. Therefore, no increased demand on recreational facilities would result.

**15. TRANSPORTATION/TRAFFIC**

<b>Would the project:</b>	<b>Potentially Signif. Impact</b>	<b>Less Than Signif. w/Mitig.</b>	<b>Less Than Signif.</b>	<b>No Impact</b>	<b>Reviewed Under Previous Document</b>
a. Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections?)			X		
b. Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?			X		
c. Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?			X		
d. Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersection) or incompatible uses (e.g., farm equipment)?				X	
e. Result in inadequate emergency access?				X	
f. Result in inadequate parking capacity?				X	
g. Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?			X		

**Environmental Setting:**

Regional access from the north and south is provided by U.S. Highway 101, which generally parallels the west side of San Francisco Bay. U.S. Interstate 280 (I-280) also provides north-south access to the Bay Area, but is located further inland. Regional access from the north and south on the east side of the Bay is provided by I-880 from San Jose to Oakland, and then by I-580 and I-80 in the northern portions of the Bay. Several major roadways provide east-west access to the Bay. In the South Bay subregion, these include State Highways 237 and 84 (Dumbarton Bridge). In the Central Bay subregion, east-west access is provided by State Highway 92 (San Mateo Bridge) and the San Francisco-Oakland Bay Bridge. State Highways 4 and 37 are the primary east-west regional access roadways in the North Bay and Suisun Bay subregions.

Access to the control sites will be via regional and local roadways. Access to coastal areas will require the use of public and private roads. Access to privately owned coastal areas would require permission from the property managers and/ or owners.

**Impact Discussion:**

- a. *Would the project cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, of congestion at intersections)? - **LS***

The proposed project would not result in a substantial increase in traffic nor have the potential to result in a substantial increase in the number of vehicle trips, the volume to capacity ratio on roads or congestion at intersections. It is anticipated that the maximum number of trucks in a particular area under the worst case scenario (i.e., volunteer groups hand pulling plants) would be 20. This would occur a maximum of five times during the year.

- b. *Would the project exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways? - **LS***

As described above, the proposed project would generate negligible traffic and as such would not exceed a level of service standard, either individually or cumulatively.

- c. *Would the project result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks? - **LS***

It is not anticipated that the project would result in a substantial change in air traffic, although the use of helicopters for the transport of equipment (e.g., boats and aerial spraying) is a consideration. However, the use of helicopters would be localized, temporary and would not significantly affect air traffic levels or result in substantial safety risks. Air activities taking place near airports would be coordinated with local air traffic control stations.

- d. *Would the project substantially increase hazards due to a design feature (i.e., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? - **NI***

The proposed project would not result in any new construction and therefore would not present hazards due to a design feature.

- e. *Would the project result in inadequate emergency access? - **NI***

No aspect of the proposed project would have the potential to affect emergency access.

- f. *Would the project result in inadequate parking capacity? - **NI***

The proposed would not have the potential to affect parking capacity. As described under “a,” above, traffic generated by the proposed project would be minimal and would only occur on an occasional basis.

- g. *Would the project conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)? - **LS***

Only a small amount of traffic would be generated by the project at intermittent periods during the plants growth cycle. These vehicles would use existing streets and facilities, including the Bay Trail.

## 16. UTILITIES AND SERVICE SYSTEMS

Would the project:	Potentially Signif. Impact	Less Than Signif. w/ Mitig.	Less Than Signif.	No Impact	Reviewed Under Previous Document
a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				X	
b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X	
c. Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X	
d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?				X	
e. Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				X	

### Environmental Setting:

Urban areas have a complex maze of underground utilities. Utility pipelines and cables are usually buried beneath roadways or within road or railroad rights-of-way (ROWs). Bay Area electric infrastructure consists of a large and complex grid of power plants, transmission lines, and substations. Generating facilities in the region are primarily fired with natural gas and oil. A description of all underground utilities that cross or lie within the Bay Area would not be necessary. Locations and types of buried utilities in the Bay Area would not be affected by the proposed project.

### Impact Discussion:

- a. *Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?*  
- *NI*

A Waste Discharge Requirements Permit (WDRs) may be required from the RWQCB. However, it is not expected that the proposed project would exceed current requirements. Please see section 8, Hydrology and Water Quality, for additional detail.

- b. *Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects? - NI*

The proposed project does not include structural development that would require water delivery or would generate wastewater.

- c. *Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects? - NI*

No development would occur as a result of the proposed project. Removal of *Spartina* would not alter storm water drainage patterns.

- d. *Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed? - NI*

The proposed project does not include structural development that would require water delivery. No increased demands on the water supply would result.

- e. *Result in a determination by the wastewater treatment provider, which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments? - NI*

The proposed project would not require wastewater treatment services. No impacts would occur.

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