

Draft Wetland Mitigation Plan

for the

Russell City Energy Center

Hayward, California

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INTRODUCTION

Calpine Corporation (Calpine) proposes to construct, own, and operate the Russell City Energy Center (RCEC), a 600-MW nominal, natural gas-fired, combined-cycle, baseload merchant power plant. Plant construction will require the fill of 1.68 acres of seasonal wetland. Calpine has acquired an option to purchase 26.19 acres of land in two adjoining parcels currently owned by Waste Management, Inc. The site has significant natural resources of value to the Hayward Regional Shoreline Park. The mitigation plan for this parcel involves several alternative measures to make significant improvements to managed salt marsh and adjacent upland habitat, as well as the creation of 1.68 acres of wetland (1:1 replacement ratio). Calpine is attempting to reach agreement with the East Bay Regional Park District now regarding donation of the property and the related endowment. Calpine shall assure, however, that in any case, the property will be placed into proper stewardship for execution of this mitigation plan.

This conceptual mitigation plan outlines a land and resource management framework that reflects input and interests of affected state and federal agencies, namely the California Energy Commission (CEC), U.S. Fish & Wildlife Service (USFWS), California Department of Fish & Game CDFG), U.S. Army Corps of Engineers (Corps), and the San Francisco Regional Water Quality Control Board (SFRWQCB), as well as the stakeholders in the Hayward Regional Shoreline Park (East Bay Regional Park District, Hayward Area Recreation & Parks District (HARD), City of Hayward, and Mosquito Abatement). Comments and suggestions are invited from these agencies by January 4, 2002. Following receipt of comments, this plan will be revised and refined for presentation at a public workshop on January 08, 2002. The agency group will then convene to develop a final conceptual plan, implementation plan, monitoring plan, and long term management plan. These will be incorporated into the final mitigation plan, with a target submission date to the Corps of February 15, 2002.

I. PROJECT DESCRIPTION

A. Location of Project

The proposed Russell City Energy Center is located in the City of Hayward, Alameda County, California (Figure 1-1). The project will be constructed on two adjoining parcels:

Salem Broadcasting Company	Runnels Industries Inc.
3636 Enterprise Avenue	3590 Enterprise Ave.
Hayward, CA 94545	Hayward, CA 94545

The mitigation parcel is located adjacent to the RCEC plant site, on two parcels owned by Waste Management, Inc. of California (Figure 1-1). The applicant has acquired an option to buy the parcels should the RCEC be licensed. The 26.19-acre mitigation site is made up of two parcels, listed by the Alameda County Assessors office as follows:

438-0080-013-04	438-0080-07-03
22.04 acres	4.15 acres
Waste Management, Inc. of California	Waste Management, Inc. of California
Bush Lane	Bush Lane
Hayward, CA 94545	Hayward, CA 94545

B. Brief Summary of Project

Calpine Corporation proposes to construct, own, and operate the RCEC as a merchant power plant. The proposed 14.7-acre RCEC site is comprised of two adjacent parcels located within the commercial/industrial zone of the City of Hayward. One 11-acre parcel is currently occupied by the transmitter facilities of the Radio Station KFAX, AM 1100. The 11-acre parcel is dominated by ruderal species with some fill areas, as well as patches of alkaline seasonal wetlands, totaling 1.68 acres. A second 3.7-acre parcel, which makes up the proposed RCEC site, is currently occupied by Runnell's Industries, Inc, a sand blasting facility.

The proposed RCEC is a 600-MW nominal, natural gas-fired, combined-cycle, baseload merchant power plant. It will have two "F-Class" combustion turbine generators, two multi-pressure, supplementary-fired heat recovery steam generators, a single 3-pressure, reheat, condensing steam turbine generator (STG), and a hybrid, wet/dry plume-abated mechanical draft cooling tower. In addition to the power plant, the project will entail:

- A 230 kilovolt (kV) on-site switchyard.

- A 1.1-mile 230 kV, double circuit overhead transmission line connecting the RCEC switchyard to the Pacific Gas & Electric (PG&E) Eastshore Substation via PG&E's existing Eastshore to the Grant 115 kV transmission corridor, which is located approximately 600 feet from the northeast corner of the project site.
- Approximately 0.9 miles of 16-inch-diameter underground natural gas pipeline from PG&E's distribution line 153 to the RCEC site.
- Approximately 100 feet of new 12-inch-diameter domestic water/firewater pipeline from the existing City water main on Whitesell Street.
- Approximately 2,000 feet of new industrial wastewater discharge pipeline to the headworks of the Hayward Water Pollution Control Facility (WPCF).
- An Advanced Wastewater Treatment plant to produce high quality water for plant cooling and process makeup needs from treated secondary effluent that is currently discharged to the San Francisco Bay via East Bay Discharges Authority
- Relocation of the existing KFAK radio transmission towers to the Old West Winton Panhandle Landfill, a closed landfill located approximately 1.25 miles northwest of the existing transmitter facility.

Approximately 12.55 fenced acres will be required to accommodate the generation facilities, control/administration buildings, switchyard, emission control equipment, storage tanks, parking area, and storm water detention basins. Access to the RCEC will be from a new entrance driveway on Enterprise Avenue. The existing Union Pacific Railroad Company industrial rail spur located immediately south of the site will be used for delivery of heavy equipment components during construction.

C. Responsible Parties

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Figure 1-1. Project Location

D. Jurisdictional Areas to be Filled

Construction of the facility will require the fill of approximately 1.68 acres of jurisdictional wetlands (Figure 1-2). Discharge of fill material, generically known as “select structural material,” will be accomplished by a dump truck and front-end loader. Depth of fill will be less than two feet, with a side slope angle of less than 1:50. Most of the surface within the fenced area will be paved to provide internal access to all project facilities and on-site buildings.

E. Type(s), Functions, and Values of the Jurisdictional Areas

The property is mapped as a palustrine, emergent, temporarily flooded, diked/impounded wetland on the National Wetlands Inventory map for the San Leandro Quadrangle (USFWS 1999). During a wetland delineation conducted on February 28, 2001, the property was found to be dominated by ruderal vegetation, either on fill or upland areas. Eight ponded areas were delineated that meet the soils, hydrology, and vegetation criteria of wetlands, totaling 1.68 acres (see Figure 1-2). The wetlands on the RCEC property are of low functional value.

Using the hydrogeomorphic classification (Brinson 1993), the wetlands on the proposed RCEC site are topographic depressions that retain inflow from precipitation. Water loss is primarily due to evapotranspiration and infiltration to groundwater. Soils are saturated or inundated to a depth of two to three inches during the winter, mapped as Reyes Clay (USDA 1988). Hydric soil determination was based on evidence of a reducing environment (low chroma and mottles). The jurisdictional determination was completed on June 12, 2001, File No. 26001S.

The proposed RCEC site is located approximately 148.1 feet from the historic boundary of the *Crystal Salt Pond* and salt marsh complex (Sowers et al. 1997), at an elevation of approximately 5.3 to 10.3 feet above mean sea level (msl). In historic times, the area probably received salt water through wind and periodic flooding, creating the current saline soil and salt-tolerant vegetation. Currently, marine influence is excluded by a system of dikes and levees built up in the Hayward Regional Shoreline Park.

Habitat and species composition

Vegetation at the RCEC site is dominated by upland ruderal species and salt-tolerant hydrophytic species. The wetland areas are dominated by saltgrass (*Distichlis spicata*), alkali heath (*Frankenia salina*), creeping wildrye (*Leymus triticoides*), with Italian ryegrass (*Lolium perenne*) and curly dock (*Rumex crispus*) as associated species. Upland ruderal vegetation at the site is dominated by filaree (*Erodium botrys*), perennial ryegrass (*Lolium perenne*), and slender wild oats (*Avena fatua*). Less dominant natives include three-week fescue (*Vulpia microstachys*) and blue-eyed grass (*Sysirinchium bellum*).

Common wildlife species include voles and field mice, which provide forage for raptors. Black-tailed jackrabbit (*Lepus californicus*) burrows and runs were noted on the property, with several apparently unoccupied burrows in the embankment to Enterprise Avenue on the northern end of the property. Burrowing owls (*Athene cunicularia*) were not observed during surveys nor was there evidence of burrowing owl activity at the burrow sites (habitat suitability for burrowing owls is low, due to the tall, dense, moist vegetation). Bird species observed include red-winged blackbirds (*Agelaius phoeniceus*), western meadowlarks (*Sturnella neglecta*), and savannah sparrows (*Passerculus sandwichensis*).

The RCEC site does not have suitable habitat for waterfowl and most shorebird species. The marginal salinity, isolation, and ephemeral nature of the wetlands on the RCEC site make them unsuitable for the majority of invertebrate prey species, which provide forage for shorebirds and waterfowl.

Hydrology

The climate in the South Bay area is temperate, and is influenced by the regional topography and proximity to the Pacific Ocean. The climate is fairly constant and predictable, with a bi-modal seasonal temperature and rainfall pattern. Summers are usually warm and dry, with the exception of morning and evening fog due to a marine inversion layer. Winters are wet and cool, with rain occurring between September and April.

The project site lies within the South East Bay Plain Groundwater Basin (SEBP Basin), an alluvial aquifer system consisting of poorly consolidated to unconsolidated lenses of gravel, sand, silt, and clay (CH2MHill 2000). The Shallow Zone of the aquifer (ACWD 1998) represents a water table aquifer system with relatively high vertical resistance to flow (CH2MHill 2000). This layer is about 115 to 130 feet thick in the project area, and consists of recent marine clay, Young Bay Mud, aeolian sand, and alluvial deposits, laid down on top of the Old Bay Mud sequence during the Holocene Age. Perched water and localized aquifers shallower than 50 feet exist in this unit, such as those found on the RCEC site. Depth to groundwater on the project site is only a few feet.

The project site is located in a small urban drainage area (approximately 205 acres, Figure 1-3) that extends from north of Highway 92 to just south of Enterprise Road. The majority of the watershed drains through an unnamed Alameda County flood control channel that runs south of the project site. The site itself currently drains into the adjacent Waste Management property and the City of Hayward storm water retention pond. Construction of the proposed RCEC project will convert approximately 10 acres of ruderal areas and wetlands to paved surfaces, which could affect flows into the adjacent storm water retention pond and Alameda County flood control channel.

Figure 1-2. Wetland Delineation

Figure 1-3. Site watershed

As currently designed, storm water runoff from within and around the generating and industrial portions of the site will be curbed to contain and route runoff. This runoff will be treated and then sent to the headworks of the City of Hayward WPCF. Rain that falls on non-process areas such as roofs and parking lots will drain directly to the on-site storm water detention ponds in the southwest and southeast corners of the RCEC site. The detention ponds will be sized to accept a 15-year, 24-hour storm event. Design of the containment curbing around the process areas of the site will also consider the capacity needed to contain runoff from a catastrophic fire. The containment curbing will be designed for the 100-year 24-hour storm event.

Runoff collected in the storm water detention basins will be evaluated for water quality before release into the flood control channel that runs along the southern border of the property. However, the RCEC will have the ability to retain water as needed. As part of a storm water management plan, water discharge into the channel following storm events will be coordinated with the management of HARD Marsh and the salt marsh harvest mouse preserve to ensure flows do not occur at inappropriate times. A storm water management plan is currently being developed to address these issues, in cooperation with the Alameda County Flood Control District, the City of Hayward, and the San Francisco Regional Water Quality Control Board, the East Bay Regional Parks District, and the Hayward Area Parks & Recreation District. In addition, a Stormwater Pollution and Spill Prevention Plan (SWPPP) will be developed, as well as an incident management plan.

Nutrient Cycling & Removal of Elements or Compounds

The San Francisco Bay currently receives significant inputs of contaminants such as heavy metals, pesticides, and dissolved solids. Significant progress has been made in reducing point-source pollution, such as heavy metals and dissolved solids, due to increased standards for industry and wastewater discharges (USGS 1995). However, non-point pollution due to urban runoff remains a significant issue.

Construction of the RCEC power plant will result in a net increase in runoff. As discussed above, runoff from process areas will be diverted for treatment prior to discharge to the Hayward WPCF. Runoff from rooftops and parking areas will be routed to on-site storm water retention ponds. Area storm water runoff contains three primary elements or compounds:

- 1) Petroleum products
- 2) Nutrients (nitrate), dissolved and suspended solids, and an increased biological oxygen demand (BOD)
- 3) Elevated copper, chromium, lead, and nickel, as well as trace amounts of other metals.

Many of these contaminants will settle out in the retention basins, and the water will be tested prior to discharge into the adjacent Alameda County flood control channel. Any storm water

runoff that does not meet water quality standards will be treated and routed to the Hayward WPCF.

II. PROPOSED MITIGATION SITE

A. Location and Size of Mitigation Area

The RCEC mitigation site is located in the City of Hayward, in Alameda County, CA. The approximately 26.19 acre site, comprised of two parcels, is located on Bush Lane, north of Route 92 and Breakwater Avenue, in Hayward, CA. The site borders the Hayward Area Regional shoreline to the south and west, the City of Hayward industrial corridor to the east, and the RCEC site to the north.

B. Ownership Status

Waste Management Inc. currently owns the two adjacent parcels that are being considered for the RCEC mitigation site. Calpine has procured an option to buy the parcels should the project be licensed.

C. Existing Functions and Values of Mitigation Area

The mitigation parcel is located on the historic transition zone between the Crystal Salt Pond salt marsh complex and the adjacent uplands (Sowers et al. 1997). Such ecotones are often important centers of biological activity. In the San Francisco Bay, the marsh-upland ecotone was historically characterized by highly diverse vegetation and valuable habitat for wildlife (BEHG 2001). Currently, the mitigation parcel does not receive marine influence due to the construction of a system of dikes and levees associated with the historic reclamation activities in the Bay. This provides significant opportunities for habitat improvement within the parcel.

The property is divided into three areas by a levee and an unnamed Alameda County flood control channel. Habitat types are shown in Figure 2-1, and habitat acreages are shown in Table 2-1.

- **Area 1** lies northwest of the Alameda County flood control channel, and is comprised of portions of the City of Hayward storm water retention pond, transitional panne features, seasonal wetland, and adjacent upland areas. The *transitional panne* (hypersaline mud-bottomed pools that form longitudinal to the edge of salt marshes) and seasonal pond features pool water during the winter and provide habitat for waterfowl and shorebirds. Area 1 also contains pickleweed-dominated diked seasonal wetland, and ruderal-dominated adjacent upland habitat.
- **Area 2** lies southeast of the Alameda County flood control channel, and east of the existing levee. The main feature of Area 2 is a seasonal pond. The seasonal pond is shallow with a mud bottom, with pickleweed-dominated diked seasonal wetland around the edges. Seasonal ponds provide important habitat for a wide variety of shorebirds,

wading birds, and waterfowl. Area 2 also contains ruderal-dominated adjacent upland habitat, including the existing levee, and a cattail-dominated freshwater marsh at the storm water outfall at Bush Lane.

- **Area 3** lies southeast of the Alameda County flood control channel, and west of the existing levee. Area 3 consists of portions of a pickleweed-dominated managed marsh that is contiguous with a City of Hayward property and the East Bay Regional Park District *Salt Marsh Harvest Mouse Preserve*. Area 3 has been identified as salt marsh harvest mouse habitat by the California Natural Diversity Data Base (2001).

Table 2-1. Acreages of the habitat types on the mitigation parcel.

	Area I	Area II	Area III	Flood Control Channel	Total
Diked seasonal wetland	2.2	4.1	--		6.3
Seasonal pond	1.0	2.7	--		3.7
Transitional <i>panne</i>	0.8	--	--		0.8
Adjacent upland	2.1	5.1	--		7.2
Freshwater marsh	--	0.5	--		0.5
Managed salt marsh	--	--	6.2		6.2
Flood Control Channel				1.5	1.5
Total	6.1	12.4	6.2	1.5	26.2

Habitat and species composition

The seasonal wetland, seasonal pond, and managed marsh portions of the property are dominated by pickleweed, with brass buttons (*Cotula coronopifolia*) as an associated species. The adjacent uplands are more diverse, dominated by saltgrass, alkalai heath, wild pea (*Lathyrus* sp.), perennial ryegrass, and slender wild oats. The levee is dominated by black mustard (*Brassica nigra*) and prickly lettuce (*Lactuca serriola*). Diked seasonal wetlands similar to the mitigation parcel can contain relictual populations of several special-status plant species. These include special-status plant species that inhabit the high marsh or the marsh-upland ecotone of the Bay-estuary and have experienced local extirpation, such as Point Reyes bird’s beak (*Cordylanthus maritimus* spp. *hispidus*), Alkali milk-vetch (*Astragalus tener* var. *tener*), Salt marsh owl’s clover (*Castilleja ambigua*), smooth goldfields (*Lasthenia glabrata*), California seablite (*Suaeda californica*), and California saltbush (*Atriplex californica*) (Tibor 2001). However, surveys in March, April, and June did not reveal the presence of any rare, threatened or endangered plants.

Bird species observed in the mitigation parcel include the Canada goose (*Branta canadensis*), killdeer (*Charadrius vociferus*), least sandpiper (*Calidris minutilla*), western gull (*Larus occidentalis*), and northern harrier (*Circus cyaneus*). Although the freshwater seasonal ponds and transitional *panne* features on the mitigation property are important habitat elements for

Figure 2-1. Habitat types at the mitigation site.

shorebirds and waterfowl in the broader context of the Hayward Regional Shoreline Park, the site does not provide currently suitable habitat for any of the special-status bird species known to occur in the general vicinity (e.g. California clapper rail, California least tern, western snowy plover). The freshwater seasonal pond and transitional panne have been identified in the Baylands Ecosystem Habitat Goals Project (2001) as rare and important habitat components. In addition, at meetings held on December 11, 12, and 17, the East Bay Regional Park District and other agencies have expressed interest in maintaining these elements during the enhancements to the mitigation site.

Trapping records from the Hayward Area Regional Shoreline indicate that the majority of harvest mice occur in the high marsh/upland ecotone (Mark Taylor, pers. comm.). The mitigation parcel is located on this ecotone, and is potentially an important site for this species. However, the site currently provides marginal habitat for the salt marsh harvest mouse. The habitat value of the site could be greatly improved with the intrusion of salt water into Area 3, which would increase the density of pickleweed and other halophytes that provide forage and cover.

Hydrology

The five-foot contour line runs approximately northwest through the mitigation parcel. The property is within the 100-year floodplain. The dominant source of water in Areas 1 and 2 is rainfall. Area 1 is a diked seasonal wetland that receives runoff from the proposed RCEC plant site, and overflow from the Alameda County flood control channel. Water ponds in the storm water retention pond and in the remnant *transitional panne* features from November to May/June depending on rainfall patterns. The water is brackish due to remnant salinity in the soil.

Area 2 receives direct rainfall, as well as outfall from the Bush Lane storm water drainage. In addition, there is a culvert connection with the Alameda County flood control channel to the north, and a Caltrans drainage ditch that runs parallel to Highway 92 to the south. The seasonal pond in Area 2 ponds water from November to May/June depending on rainfall patterns. The pond is approximately one foot deep, with a mud bottom, with brackish water.

The hydrology of Area 3 must be viewed in the broader context of the managed marsh system that includes the adjacent City of Hayward property and the Salt Marsh Harvest Mouse Preserve (See Figure 3-1). In addition to direct rainfall, there are two main sources of water to the system, freshwater outfall from the Alameda County flood control channel, and salt water from the tidegates at the eastern boundary of the Salt Marsh Harvest Mouse Preserve. The flood control channel flows west through the parcel, then south along the western edge of the managed marsh. In contrast, salt water flows in from the western edge of the Salt Marsh Harvest Mouse Preserve, to mix with the freshwater and create brackish conditions.

Both salt and freshwater flows into Area 3 of the mitigation parcel are severely restricted due to the siltation of water conveyance channels. There is a borrow pit that parallels the existing levee, which has only been excavated to the border of the Salt Marsh Harvest Mouse Preserve. The remnant tidal channels typical of the high marsh (narrow and relatively shallow due to the low energy, infrequent tidal influence in high marsh areas) have also been silted in, restricting flows. There is potential to greatly improve the pickleweed habitat in Area 3 by dredging the borrow pit that parallels the levee and remnant tidal channels to allow saltwater intrusion. This would be facilitated by other restoration efforts currently under development, including improvements to the channels to the north and south of the HARD restoration project, and amplification of the tidegate system in the Salt Marsh Harvest Mouse Preserve. These include four 36" tidegates on the southwestern edge of the property and a 48" tidegate on the northwest portion of the property.

Soils

The mitigation parcel is in the Reyes Clay formation, which includes alluvial soils on tidal marshes and flats. The diked seasonal wetland, seasonal pond, and managed marsh portions of the property consist of ponded Reyes Clay, inundated from approximately November to April. These soils have a gray A horizon and a black B horizon, with any mottles masked by the organic matter content. These areas meet the soils, hydrology, and vegetation criteria of a jurisdictional wetland.

Portions of the adjacent uplands along the wetland fringe can be classified as drained Reyes Clays that are saturated during the winter months. While these areas are classified as adjacent uplands from the perspective of the salt marsh harvest mouse, the vegetation is dominated by facultative species, indicating these areas would meet the criteria of a wetland. However, the majority of the uplands would not be classified as wetlands, being better drained olive gray soils without mottles. The vegetation is dominated by upland species.

D. Present and Proposed Uses of Mitigation Area

Currently, the mitigation parcel is zoned as part of the Hayward Industrial Corridor within the urban city limits. It is privately owned by Waste Management, Inc., and potentially developable under current zoning. However, the City of Hayward Agenda Report (City of Hayward Community and Economic Development Department 10/23/2001) proposed a land use revision for various areas along the bayland shoreline, as part of its ongoing General Plan Update process. The report proposes a zoning change for two parcels, "currently owned by the City of Hayward and Waste Management, Inc." from Industrial Corridor to Open Space/Baylands, including an adjustment of the Urban Limit Line. The proposed change in designation recognizes:

- 1) the value of the current habitat
- 2) the unlikelihood of urban development in this location

- 3) the potential for habitat enhancement as envisioned in the Hayward Area Shoreline Plan.

This mitigation plan complies with the City of Hayward Agenda Report, in proposing acquisition of the Waste Management parcels, enhancing and restoring portions of the property, donating the land to the Hayward Shoreline Regional Park, and establishing a funding mechanism for management in perpetuity. This mitigation plan will increase the amount of managed marsh in the area, enhance habitat for the salt marsh harvest mouse, and provide benefits to the user groups of the Hayward Shoreline Regional Park.

E. Present and Proposed Uses of all Adjacent Areas

Land uses surrounding the mitigation parcel include the City of Hayward Industrial Corridor, baylands/open space, and flood control infrastructure. The Hayward Industrial Corridor is located to the north and east of the mitigation parcel. The Industrial Corridor extends to the north for about 1.5 miles to the Hayward Air terminal, and to the east for an equal distance. A variety of warehousing and industrial businesses line Enterprise Avenue, Whitesell Street, and Depot Road, the nearest streets.

The mitigation site is bordered on the south and west by baylands/open space, which make up the Hayward Shoreline Regional Park, and other parcels under various ownership. Some current uses of the land to the south and west of the mitigation site include recreational activities at the Hayward Shoreline Regional Park, managed by East Bay Regional Parks District (EBRPD) and the Shoreline Interpretive Center, run by the Hayward Area Recreation and Parks District (HARD). The Shoreline Interpretive Center is located about 0.73 miles from the RCEC plant site at the end of Breakwater Drive, adjacent to State Route 92. From that location, hiking trails extend west to the bay and north along the bay shore. Other important natural resources include the HARD marsh, the Salt Marsh Harvest Mouse Preserve, Cogswell Marsh, and the Triangle Marsh.

Due to the location of the mitigation parcel in the broader context of the Hayward Regional Shoreline Park and the hydrological connectivity of the Waste Management parcels with other parcels further west, restoration and management of the mitigation parcel should be coordinated with the East Bay Regional Park District, the City of Hayward, the HARD Marsh, and the Salt Marsh Harvest Mouse Preserve.

F. Zoning

The RCEC mitigation site currently falls under two zoning designations: **Floodplain (FP)** and **Industrial (I)** use. The City uses these zones to establish the descriptions, limits, and direction of growth for areas within the City's Sphere of Influence. The purpose of the Industrial designation is to encourage the development of industrial uses in suitable areas while minimizing

effects to other areas. The Floodplain designation is used to designate the City's perennial flood zones.

Other predominant zoning designations within one mile of the project site are Single-Family Residential (RS), Heavy Industrial (County-M-2), and Planned Development (PD) (City of Hayward Zoning Ordinance 1999). Also within one mile of the project site are two unincorporated areas of Alameda County that are entirely surrounded by the City of Hayward. An area along Depot Road north of the project, for example, is zoned Heavy Industrial (M-2) under the County's zoning system. This area contains several automobile salvage businesses. Areas further north along Clawiter Road and Industrial Boulevard are also under the County's zoning jurisdiction including both residential and industrial zones.

III. GOAL OF MITIGATION

The mitigation goals for the Waste Management parcels are presented here in conceptual format. Following review by the CEC, USFWS, CDFG, the Corps, SFRWQCB, East Bay Regional Parks District (EBRPD), Mosquito Abatement, and the City of Hayward/HARD, the plan will be revised for presentation at a California Energy Commission public workshop on January 8, 2002. Following agreement on the conceptual plan, a detailed implementation plan, monitoring plan, and long term management plan will be developed for the property. This will be accomplished through a stakeholder planning meeting among the project owner, Calpine Corporation, the East Bay Regional Parks District, and the City of Hayward/HARD.

The elements of this conceptual plan are shown in Figure 3-1. This conceptual plan suggests a suite of techniques that could be used to enhance or improve, not only the Waste Management parcel, but also the City of Hayward's parcel to the west (consisting of salt marsh east and north of the Salt Marsh Harvest Mouse Preserve). Since it is difficult to gauge the amount of wetland creation, enhancement, and protection that would be required to adequately compensate for the potential effects of the RCEC, this general plan with suggested alternative methods is presented here as a departure point for discussion among the interested parties.

One method of wetland enhancement/restoration suggested would be to improve water flows through the contiguous managed marsh system made up of the Salt Marsh Harvest Mouse Preserve, portions of the City of Hayward property, and Area 3 of the mitigation parcel. This would result in the enhancement of approximately 30 acres of managed salt marsh, including portions of the City of Hayward's salt marsh property. Due to the California Fully Protected Status of the salt marsh harvest mouse, mitigation measures would be designed to ensure that "take" would not occur during implementation of the mitigation plan.

As discussed in the previous section, any enhancements to the managed salt marsh would be coordinated with EBRPD and the City of Hayward/HARD, and are in part dependent on plans to increase saltwater flow capacity associated with the HARD restoration project and the Salt Marsh Harvest Mouse Preserve. Currently, plans are underway to improve flows into the Salt Marsh Harvest Mouse Preserve by widening and deepening the channels to the north and south of the HARD restoration project, and installing a series of tidegates. Following improvements (planned for completion in February 2002), there will be a total of one 48" tidegate and four 36" tidegates. These improvements would make it possible to expand water conveyance channels from the Salt Marsh Harvest Mouse Preserve, through the City of Hayward property, to Area 3 of the Waste Management mitigation parcel. Implementing this alternative would also require the creation of digital ortho-rectified aerial photographs with 1-foot contours could be created, to

be used in a detailed hydrologic assessment to ensure project design and grading-construction achieve the required flow improvements.

One method available for improving water conveyance would be dredging of the borrow pit that parallels the levee (which is currently silted in), to ensure that the resulting flow gradient would be sufficient to bring salt water to Area 3 of the mitigation parcel. Further enhancements could be achieved through excavation of the silted remnant tidal channels in Area 3 of the mitigation parcel and the City of Hayward property. This would help salt water to flow from the borrow pit west towards the Alameda County flood control channel.

An alternative plan would be to reduce or breach the levee of the Alameda County flood control channel in Area 3 of the mitigation parcel, and remove silt fill from borrow pit and remnant tidal channels from the north. This would allow this freshwater source to be routed south along the eastern edge of the marsh system, improving flows into Area 3 of the mitigation parcel and the City of Hayward property. While this is a freshwater source, it would achieve the desired result of improvement of flows through the system should there be topographic obstacles to the movement of salt water into Area 3 from the bay.

A second enhancement mechanism would be the enhancement of the vegetation in the diked seasonal wetland-adjacent upland transition zone in Areas 1 and 2. This would be accomplished through manual vegetation removal, and revegetation by seed, plugs, or vegetative propagation, depending on the species.

A third element of this mitigation plan is the creation of a minimum of 1.68 acres of wetland, a 1:1 ratio for the fill of seasonal wetlands on the RCEC property. A 1:1 ratio is the minimum required by the Corps and SFRWQCB, given that significant enhancements to existing wetland resources will also occur. During the detailed hydrologic study, two alternatives will be explored, although it is probable a combination of both alternatives will be required to meet the 1.68 acreage requirement.

Alternative 1 for seasonal wetland creation would be the expansion of the cattail-dominated freshwater seasonal marsh in the southeast portion of the property, and establishment of willows. This will mimic the willow groves that historically occurred on the bay margins, which are important wildlife resources. Alternative 2 would be an investigation of ways in which the existing levee could be manipulated without significantly altering the hydrology of the seasonal pond in Area 2. The levee is as much as 20 feet wide at some points, and there may be ways that the levee width and height can be reduced to a thin berm approximately three feet high. In addition to creating the necessary wetland acreage, the resulting berm could be vegetatively enhanced to provide improved adjacent upland habitat for the salt marsh harvest mouse.

Figure 3-1. Conceptual mitigation plan

Table 3-1. Selected native species of the marsh-upland ecotone.

Scientific Name	Common Name	Ecology
<i>Achillea millefolium</i>	Yarrow	Common species of many habitats.
<i>Aster chilensis</i>	Chilean aster	Historically common from salt marsh edges, willow groves, and swales; few current reports.
<i>Aster subulatus</i>	Salt marsh aster	Historic element of salt marsh, willow grove, and saline soil communities; no current reports from edges of San Francisco Bay.
<i>Atriplex triangularis</i>	Spearscale	Species common in high marsh, sometimes considered weedy.
<i>Baccharis douglasii</i>	Salt marsh baccharis	Patchy (abundant to occasional) along the edges of salt marshes swampy places; now uncommon to rare in high marsh-upland ecotone.
<i>Baccharis pilularis</i>	Coyote brush	Common to many habitats. Can infest levees and other upland areas.
<i>Carex</i> spp.	Sedge	Three rare species from salt marsh edges currently extirpated or reduced in Bay – Estuary; several common species present.
<i>Cotula coronopifolia</i>	Brass buttons	Locally abundant in habitats such as <i>transitional panne</i> fringes or managed marshes.
<i>Cuscuta salina</i>	Dodder	Common parasite on species such as pickleweed. Can cause patch mortality, which is possibly an important disturbance element for maintenance of species diversity.
<i>Distichlis spicata</i>	Saltgrass	Dominant species of high marsh and adjacent upland areas where soil salinity is greater than 5 ppt. Reduced in some diked baylands and adjacent uplands with reduced salinity.
<i>Epilobium</i> spp.	Willow herb	Common plants of the roadsides, waterways, and wetland fringes.
<i>Euthamia occidentalis</i>	Western goldenrod	Previously common in ditches, marshes, streambanks and meadows.
<i>Frankenia salina</i>	Alkali heath	Common species of high marsh and adjacent uplands.
<i>Grindelia stricta</i> var. <i>angustifolia</i>	Gumweed	Common in tidal marsh edges, reduced in diked baylands.
<i>Helianthus bolanderi</i>	Bolander’s sunflower	Species of grassy, often disturbed places.
<i>Hemizonia pungens</i> ssp. <i>maritima</i>	Common spikeweed	From borders of salt marsh, and presumed dominant in willow groves; Currently a local, infrequent species form tidal marsh edges.
<i>Iva axillaris</i>	Poverty weed	Common inhabitant of saline habitats.
<i>Juncus</i> spp.	Rush	Three species previously common form salt marshes are now rare in the Bay – Estuary; several common species
<i>Leymus triticoides</i>	Creeping wildrye	Presumed dominant species of historic tidal marsh edge; currently only locally abundant in remnant population at several sites.
<i>Limonium californicum</i>	Sea lavender	Common in coastal beaches and dunes, salt marshes, and bays.
<i>Scirpus</i> spp.	Bullrush	Common in managed marshes.
<i>Triglochin maritima</i>	Seaside arrow-grass	Locally abundant in maritime salt marshes in Marin Co., seldom occurs in San Francisco Bay.

A. Type(s) of Habitat to be Protected, Enhanced or Created

The goals of this mitigation plan involve habitat protection, enhancement, and creation. The following is a summary of the acreage of each habitat type:

Managed salt marsh enhancement

Selected native species of the marsh-upland ecotone are listed in Table 3-1. Approximately 30 acres of managed salt marsh would be enhanced by improving hydrologic flows. This area includes Area 3 and portions of the adjacent City of Hayward property. Managed marsh would also be created in Area 3 by this technique, as the levee would be reduced to a smaller berm separating Areas 2 and 3. Acreage extent would not be determined until the final grading design is completed. The increased flow of salt water into Area 3 of the mitigation parcel and the adjacent city-owned parcel would increase the density of pickleweed and other halophytes, which provide forage and cover for the salt marsh harvest mouse. This would be a major benefit to the management of this species within the Hayward Regional Shoreline Park, as this area has been identified as salt marsh harvest mouse habitat in the CNDDDB.

Saltwater intrusion would provide additional benefits, including an increase in tidal channels and increased salinity for invertebrate prey species for shorebirds and waterfowl. Shorebird and waterfowl species that may occur in the mitigation parcel following enhancement/restoration are listed in Table 3-2. The intrusion of saltwater could lead to increased populations of marine macroinvertebrates such as clams, snails, isopods, shrimp, crabs and other crustaceans, all of which are important prey items. Benthic communities may take decades to fully evolve in a rehabilitated marsh; rate of invertebrate colonization would be dependent on conditions such as geomorphology, organic matter accretion, salinity, hydroperiod, pollution, temperature, and time of year (e.g. during blooms, emergence or migrations). Similarly, habitat use by birds would be influenced by factors such as depth of water, food productivity, anthropogenic disturbance (e.g. noise and vibration from the Hayward Industrial Corridor), weather patterns, migration shifts, exposure to predators, and neophobia (Ehrlich et al. 1988).

Adjacent upland

Approximately 7.2 acres of adjacent upland could be enhanced in Areas 1 and 2. Enhancement would be achieved through the replacement of the ruderal dominated community with a saltgrass/alkali heath-dominated community, with additional native annual and perennial species on the marsh-upland fringe.

The salt marsh harvest mouse is known to move into the adjacent grassland during the spring and summer, when the grasslands provide maximum cover (Fisler 1965, cited in BЕСP 2001). While the salt marsh harvest mouse does occur in ruderal habitat, it is thought that native plant

Table 3-2. Representative shorebird and waterfowl species potentially occurring in the mitigation parcel following enhancement/restoration.

Common Name	Scientific Name
Killdeer	<i>Charadrius vociferus</i>
Least sandpiper	<i>Calidris minutilla</i>
Black-necked stilt	<i>Himantopus mexicanus</i>
Long-billed dowitcher	<i>Limnodromus scolopaceus</i>
American coot	<i>Fulica americana</i>
Mallard	<i>Anas platyrhynchos</i>
Green-winged teal	<i>Anas crecca</i>
Ruddy duck	<i>Oxyura jamaicensis</i>
Common goldeneye	<i>Bucephala clangula</i>
Canada goose	<i>Branta canadensis</i>
Pied-billed grebe	<i>Podilymbus podiceps</i>
Great blue heron	<i>Ardea herodias</i>

species, especially halophytes native to the marsh fringe, provide optimum cover and forage during the spring and summer (BESCP 2001). Therefore, the adjacent upland in Areas 1 and 2 will be enhanced to provide increased native plant cover. This will include the replacement of ruderal species with a saltgrass/alkali heath community, as well as additional species native to the marsh fringe (Table 3-2).

Freshwater wetland and willow planting

The cattail-dominated freshwater wetland will be enlarged and enhanced with willow plantings (e.g. arroyo willow [*Salix lasiolepis*]), which will mimic the historic willow groves. Willows can be vegetatively propagated from stem cuttings. Acreage extent will not be determined until the final grading design is completed.

Willow groves were historically important resources for wildlife, especially for songbirds that nest in willows. Willow groves were also important resources for maintenance of water quality. This is an important feature in this project, as the freshwater wetland is created from an existing drainage feature.

Diked seasonal wetland

Approximately 2.2 acres of diked seasonal wetland will be protected in Area 1, and 4.1 acres of diked seasonal wetland will be protected in Area 2.

Seasonal pond

Approximately 1.0 acres of seasonal pond habitat will be protected in Area 1, and a 2.7-acre seasonal pond will be protected in Area 2.

Transitional panne protection

Approximately 0.8 acres of *transitional panne* features will be protected in Area 1.

Table 3-3. Habitat creation, enhancement, and protection goals.

Habitat Type	Enhancement	Acres Affected
Managed salt marsh	Improve hydrology	30 acres
Adjacent upland	Promote native species	7.2 acres
Freshwater wetland	Willow plantings	1.68 acres or more
Diked seasonal wetland	Preservation	6.3 acres
Seasonal pond	Preservation	3.7 acres
Transitional <i>panne</i>	Preservation	0.8 acres

IV. IMPLEMENTATION PLAN, MONITORING PLAN, AND LONG-TERM MANAGEMENT PLAN

As part of the implementation plan and long-term management plan, it would be desirable that a cooperative agreement be forged between local stakeholders. These include:

- *Calpine Corporation, Project Owner.* The applicant is responsible for Clean Water Act Section 401 and 404 permitting, purchase of the mitigation parcel, development of a mitigation plan, funding for the wetland enhancement, transfer of title to the East Bay Regional Park District, and establishment of a trust fund for management in perpetuity.
- *East Bay Regional Park District.* The East Bay Regional Park District is planned to be the recipient and long-term manager of the mitigation parcel. Funding for management will be through a trust fund established by the project owner.
- *City of Hayward.* The City of Hayward owns the parcel adjacent to the mitigation parcels, where much of the hydrologic improvements are planned to occur. A cooperative agreement with the project owner and East Bay Regional Parks District will have to be formed for effective construction and long-term implementation. One option being explored is the establishment of a long-term lease so that East Bay Regional Park District can manage the property.
- *Hayward Area Parks & Recreation District (HARD).* HARD is currently restoring the HARD Marsh, with associated improvements to the channel system and tidegates. A cooperative agreement with the project owner and East Bay Regional Parks District will have to be formed for effective construction and long term implementation.
- *Mosquito Abatement.* Mosquito abatement is responsible for pest management in the Hayward Regional Shoreline. In addition to project review, a cooperative agreement with this agency may be necessary.

A. Implementation Plan

A detailed implementation plan will be developed, which will include:

- A dredging and grading plan will be developed for the hydrologic manipulations to Area 3 and the adjacent City of Hayward property, possible reduction of the levee separating Areas 2 and 3 to a low berm, and enlargement of the freshwater marsh in the southeast portion of the property. The dredging and grading plan will be presented in plan view on digital orthorectified aerial photographs with 1-foot contours, as well as profile views. The grading and dredging plan will be based on a detailed hydrologic study.

- A planting plan will be developed for the marsh-upland ecotone in Areas 1 and 2, and the willow planting in the freshwater wetland in the southeastern portion of the property. The planting plan will include methods for manual removal of existing vegetation, planting palette, site preparation, and propagation techniques (e.g. seeding, plug planting, vegetative propagation). Soil amendments will not be used in the marsh-upland ecotone, as the majority of the native species considered are adapted to nutrient poor, saline soils. However, organic amendments will be used in the freshwater marsh expansion.

The East Bay Regional Park District reported limited success with pickleweed planting, so natural colonization will be used in Area 3 and the adjacent City of Hayward property. However, vegetative propagation through mulching has been successfully used in other projects, and is an option for this project should a high risk of *Spartina* invasion be identified.

- A weed monitoring program will be developed as part of the implementation and management plan. Invasives, especially *Spartina* spp., are a major problem in marsh restoration projects in the San Francisco Bay, where they rapidly invade unvegetated substrates (SFEP 2000). The Hayward Regional Shoreline Park contains populations of *Spartina* (Smith et al. 2001), posing a potential threat to the restoration plans of the mitigation parcel. The aquatic herbicide *Rodeo* has been banned in the Bay area, leaving few options for eradication. Eradication measures include draining marshes, hand weeding recently established infestation, and burning. Other species of concern include non-native grasses, *Lepidium latifolium* and *stinkwort*.
- The salt marsh harvest mouse is a California Fully Protected species, and a mitigation plan will be developed in consultation with the CDFG to ensure there is no "take".

B. Monitoring Plan

Final success criteria for vegetation

Final success criteria for vegetation are as follows:

- A 20 percent increase in native species cover in the marsh-upland fringe in Areas 1 and 2 compared to baseline, measured at the same time of year, at the conclusion of the five-year monitoring period.
- A 20 percent increase in native species cover in the adjacent uplands in Areas 1 and 2 compared to baseline, measured at the same time of year, at the conclusion of the five-year monitoring period.
- A 20 percent increase in pickleweed cover in Area 3 compared to baseline, measured at the same time of year, at the conclusion of the five-year monitoring period.

Permanent reference plots one meter square will be established on transects. Six plots will be established in each target vegetation type, in each area. The baseline survey will occur in the spring of 2002 prior to construction, with annual monitoring for a period of five years. Corrective measures required due to mortality, weed invasion, or slow pickleweed colonization will be applied as needed.

Final success criteria for Hydrology

Final success criteria for hydrology will be developed following the hydrologic study and the identification of target hydrologic regime.

C. Contingency Measures

Aspects of this plan that require special attention are ensuring hydrologic flows in the managed salt marsh portion of the project occur as planned, and ensuring vegetative development and weed control are adequate.

If, following project implementation, hydrologic flows are not occurring as planned, remedial action will be required. An assessment of the area will be performed by a hydrologist, and develop recommendations for corrective action such as tidegate improvements, dredging, and grading as needed.

If vegetative development does not occur as planned, (e.g. slow pickleweed colonization), corrective measures can include pickleweed mulching, enrichment planting of strategic upland areas, and weed control measures.

D. Management Plan

A long-term management plan will be developed by the stakeholder group, with the East Bay Regional Parks District or other qualified agency as primary managers. Issues will include maintenance of channels and tidegates, water management, wildlife monitoring, predator control (cats and red foxes), patrolling, and long term vegetation management.

E. Project Funding

The project owner will fund the implementation of the mitigation project. In addition, a \$400,000 endowment will be established to cover the managing agency's long-term costs of managing the property. The East Bay Regional Park District will provide a proposal for accounting and reporting schedule, to ensure that endowment funds are used for the management of the mitigation parcel.

F. Schedule

The following activities are dependent upon the start of construction, and therefore the dates are not fixed.

1. Public Workshop to discuss conceptual plan will be on January 08, 2002
2. Stakeholder planning group will convene in January, with a target date for submission of final mitigation plan on February 15, 2002.
3. Baseline monitoring surveys will occur in the spring of 2002.
4. Site preparation, grading, and dredging will occur in the summer of 2002.
5. Soil stabilization and planting will occur in the fall of 2002, with maintenance and remedial measures extending through the spring.
6. The monitoring period for the mitigation parcel will begin in the spring of 2003 and will extend until December 2008, with remedial action taken as needed.
7. Final success criteria will be evaluated in the spring of 2008. If the final success criteria are not met and further corrective action is needed, the monitoring period will be extended.

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