

8.2 BIOLOGICAL RESOURCES

This section describes biological resources in the vicinity of the Russell City Energy Facility (RCEC) and the Advanced Wastewater Treatment (AWT) Plant, and the potential effects of the project on them. Section 8.2.1 discusses the affected environment, including a regional overview of vegetation, sensitive plant communities, wetlands, wildlife, economically important wildlife species, and special status species. Section 8.2.1 also discusses methods and results of biological field surveys at the RCEC and AWT plant site, and along each of the linear facilities. Section 8.2.2 discusses the effects that construction and subsequent operation of the new facilities may have on special status plant and animal species and sensitive habitats. Section 8.2.3 evaluates any potential cumulative impacts to biological resources in the project vicinity and Section 8.2.4 addresses proposed mitigation measures. Section 8.2.5 presents applicable laws, ordinances, regulations and standards (LORS). Section 8.2.6 presents agency contacts and Section 8.2.7 presents permit requirements and schedules. Section 8.2.8 contains references.

8.2.1 Affected Environment

Coastal habitats along the eastern shore of San Francisco Bay include salt marshes, brackish sloughs, coastal prairies, and coastal sage scrub communities. The largest salt marsh community in California is located around San Francisco Bay. Community types in the project study areas include coastal salt marsh, brackish sloughs, mud flats, emergent marsh, and annual grassland.

8.2.1.1 Regional Biological Resources

The proposed RCEC project is located on the alluvial coastal plain of the San Francisco Bay. The alluvial coastal plains have been largely converted to urban development, salt evaporation ponds, or ruderal (disturbed and weedy) areas. Remnants of the historic northern coastal salt marsh complex remain protected in parks and preserves (Figure 8.2-1). These include the Hayward Regional Shoreline (west of the project site), the San Leandro Shoreline Park and Oyster Bay Regional Shoreline (northwest of the project site), the San Francisco Bay National Wildlife Refuge (south of the project site), and Coyote Hills Regional Park (southeast of the project site). Other biological resources include brackish sloughs such as Alameda Creek, and brackish marshes and abandoned salt evaporation ponds with the potential for restoration.

Biological resources located in the hills east of Hayward and San Leandro include Lake Chabot and Anthony Chabot Regional Park, and Garin Regional Park. Ecosystems occurring in these areas include those commonly encountered in the foothills of the Coast Ranges, such as oak woodland and valley/foothill grassland.

8.2.1.2 Vegetation

Biological habitats within the project area consist primarily of coastal salt marsh, brackish/freshwater marsh, salt production facilities (evaporation ponds), ruderal areas, and urban landscapes with horticultural trees and shrubs. Approximately one-half of the area within a 1-mile radius of the RCEC consists of urbanized and industrial areas within the City of Hayward. The other half consists primarily of northern coastal salt marsh and brackish sloughs that have been variously preserved, converted to other uses (sewage treatment facilities, landfills, and salt evaporation ponds), or are undergoing restoration.

The dominant vegetation types at the RCEC and AWT plant site are annual grassland and seasonal wetland dominated by saltgrass (*Distichlis spicata*), and alkalai heath (*Frankenia salina*). The transmission line corridor, natural gas pipeline, and water pipelines cross urban landscapes dominated by ruderal species (i.e., weedy plants that grow in disturbed areas) and horticultural trees and shrubs.

8.2.1.3 Sensitive Plant Communities

The only sensitive plant community found within the project area is the northern coastal salt marsh habitat. Representative species found in the salt marsh community include pickleweed (*Salicornia virginica*), salt grass (*Distichlis spicata*), and alkali heath (*Frankenia salina*).

8.2.1.4 Wetlands

There are 1.68 acres of seasonal wetlands on the 14.7-acre project site. Much of the historic salt marsh community within 1 mile of the site has been altered or eliminated by urban development, sewage treatment facilities, salt evaporation ponds, and the construction of dikes and levees to prevent flooding and intrusion of saltwater. Remaining salt marsh in the project impact area includes Cogswell Marsh, managed by the East Bay Regional Park District, the Hayward Area Recreation District (HARD) marsh restoration project, and several brackish/freshwater marshes. Creeks and sloughs draining into the Bay include Mt. Eden Creek and two unnamed sloughs draining into Hayward Landing and Johnson Landing.

8.2.1.5 Wildlife

Wildlife habitat on or within 1 mile of the project site and consists of urban land, marginal freshwater/brackish marsh communities, and the highly diverse northern coastal salt marsh communities of the Cogswell Marsh and the HARD Marsh. Listed species in the northern coastal salt marsh community include the salt marsh harvest mouse (*Reithrodontomys raviventris*), clapper rail (*Rallus longirostris obsoletus*), and salt-marsh wandering shrew (*Sorex vagrans halicoetes*).

8.2.1.6 Economically Important Wildlife Species

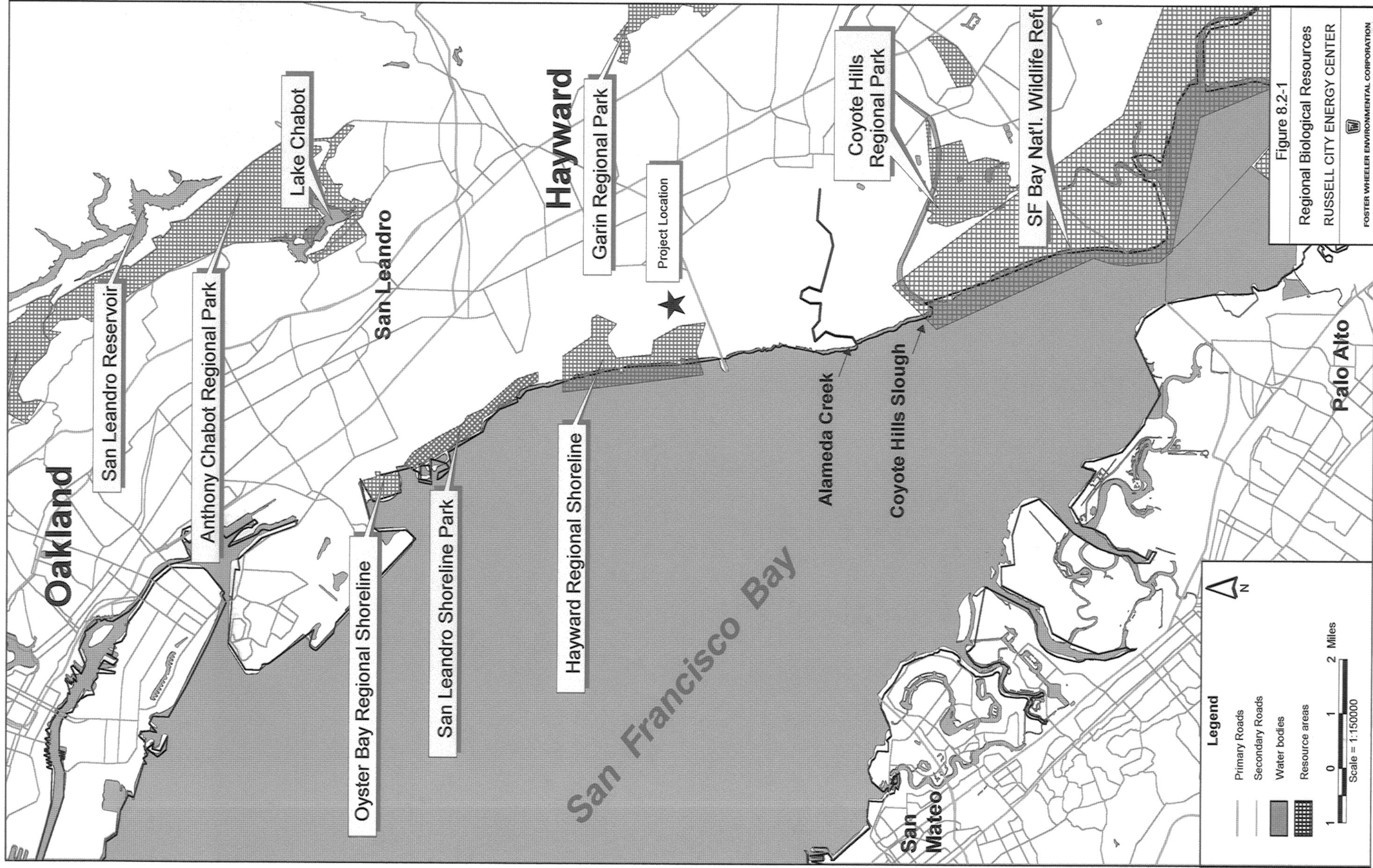
There are no economically important terrestrial wildlife species within the impact area of the proposed project.

8.2.1.7 Special Environmental Areas in Project Vicinity

Special environmental areas within a 1-mile radius of the project site include Cogswell Marsh, managed by the East Bay Regional Park District, the HARD marsh restoration project and Shoreline Interpretive Center, and a small section of Mt. Eden Creek.

8.2.1.8 Special Status Species

The designation of special status includes all state- and federally-listed species under the state and federal Endangered Species Acts (ESAs); species proposed for those listings; federal Species of Concern (SC); California Species of Special Concern (CSC); California Fully Protected species under the Fish and Game Code; and plant species designated as Rare, Threatened, or Endangered by the California Native Plant Society (CNPS). Species of concern include those that could be listed in the future and those currently protected under other laws (e.g., the Bald and Golden Eagle Protection Act, and the Migratory Bird Treaty Act).



Legend

- Primary Roads
- Secondary Roads
- Water bodies
- Resource areas

Scale = 1:150000

0 1 2 Miles

Figure 8.2-1
 Regional Biological Resources
 RUSSELL CITY ENERGY CENTER
 FOSTER WHEELER ENVIRONMENTAL CORPORATION

Standard references used for the biology and taxonomy of plants and plant communities included California Department of Fish and Game (1999); Hickman, ed. (1993); Holland (1986); Mason (1957); Munz (1959); and Skinner and Pavlik, eds. (1994). Standard references used for the biology and taxonomy of wildlife included Behler and King (1979); Ehrlich et al. (1988); Jameson and Peeters (1988); Jennings and Hayes (1994); Mayer and Laudenslayer, eds. (1988); McGinnis (1984); Peterson (1990); Stebbins (1985); Udvardy (1977); Verner and Boss (1980); Whitaker (1980); and Zeiner et al. (1988; 1990 a, b).

A computerized search of the California Natural Diversity Data Base (CNDDDB/RareFind report, February 2001) was conducted for the San Leandro, Hayward, Newark, and Redwood Point USGS topographic quadrangles (the "study Area"). This search was conducted to determine if there were any occurrences of state- or federally-listed species recorded within or near the project study area. Known locations of special status species, based on the database search, are mapped on Figure 8.2-2. Appendix 8.2-A contains the CNDDDB report. In addition to the CNDDDB/RareFind report, a letter was sent to the U.S. Fish and Wildlife Service (USFWS), Sacramento Field Office, requesting file data on special status species that could occur in the project vicinity. The USFWS response is presented in Appendix 8.2-B.

In addition to the literature sources mentioned above, site-specific information was gathered during field surveys conducted in the spring of 2001 (Section 8.2.1.10).

Special Status Plants

Table 8.2-1 lists the special status plant species in the vicinity of the project components, based on CNDDDB/RareFind and USFWS data. Brief descriptions of special status plant species that may occur in the project area are presented below. Habitat for these species occurs near the proposed project site.

Alkali milk-vetch (*Astragalus tener* var. *tener*)

- **Habitat and Biology:** Annual herb; CNPS List 1B; that occurs in coastal marsh and other alkaline habitats, such as playas, adobe clay valley and foothill grasslands, and alkaline vernal pools (Skinner and Pavlik 1994).
- **Blooming:** March to June
- **Range:** Sea level to 300 feet above msl. Known from Alameda, Contra Costa, Merced, Monterey, Napa, San Benito, Santa Clara, San Francisco, San Joaquin, Solano, Sonoma, Stanislaus, and Yolo counties.
- **CNDDDB/RareFind Records:** There are six records for this species on the USGS 7.5-minute Hayward, Newark, Redwood Point, and San Leandro Quads. There is one extirpated record within the project impact area, mapped 0.3 miles west of the Southern Pacific Railroad adjacent to the transmission lines.
- **Habitat Present in Study Area:** Habitat for this species occurs in the RCEC and AWT plant site.

Table 8.2-1. Special status plant species potentially occurring in the RCEC project area.

Scientific Name	Common Name	Federal/ State/ CNPS ^a	Source ^b	Habitat in impact area?	Blooms
<i>Astragalus tener</i> var. <i>tener</i>	Alkali milk-vetch	SC/--/1B	1,2	Yes	Mar-May
<i>Atriplex depressa</i>	Brittlescale	SC/--/1B	1	No	May-Oct
<i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i>	Big-scale balsamroot	--/--/1B	2	No	Mar-June
<i>Cordylanthus maritimus</i> ssp. <i>palustris</i>	Point Reyes bird's-beak	SC/--/1B	1	Yes	Jun-Oct
<i>Cordylanthus mollis</i> ssp. <i>hispidus</i>	Hispid bird's beak	SC/R/1B	2	Marginal	Jul-Sep
<i>Fritillaria liliacea</i>	Fragrant fritillary	SC/--/1B	2	No	Feb-Apr
<i>Helianthella castanea</i>	Diablo rock rose	SC/--/1B	1	No	Apr-Jun
<i>Hemizonia parryi</i> ssp. <i>congdonii</i>	Congdon's tarplant	SC/--/1B	2	No	Jun-Nov
<i>Horkelia cuneata</i> ssp. <i>sericea</i>	Kellog's horkelia	SC/--/1B	2	No	Apr-Sept
<i>Lasthenia conjugens</i>	Contra Costa goldfields	E/--/1B	1,2	No	Mar-Jun
<i>Lathyrus jepsonii</i>	Delta tule pea	SC/--/1B	1	Marginal	May-Jun
<i>Lilaeopsis masonii</i>	Mason's lilaeopsis	SC/R/1B	1	No	Apr-Oct
<i>Plagiobothrys glaber</i>	Hairless popcorn flower	SC/--/1A	2	Yes	Apr-May
<i>Suaeda californica</i>	California seablite	PE/--/1B	1	Marginal	Jul-Oct

^a **Status Categories:**

Federal status determined from a USFWS letter (Knight 2001, personal communication). State status determined from *Special Plants List* (June 1999), and/or *State and Federally Listed Endangered, Threatened, and Rare Plants of California* (April 1999), prepared by CDFG Natural Diversity Data Base. CNPS status determined from *CNPS Inventory of Rare and Endangered Vascular Plants of California* (Skinner and Pavlik 1994). Codes used in table are as follows:

E = Endangered; **T** = Threatened; **R** = California Rare; **PE** = Proposed Endangered

C = Candidate: Taxa for which the USFWS has sufficient biological formation to support a proposal to list as endangered or threatened.

SC = USFWS Species of Concern: Taxa for which existing information may warrant listing, but for which substantial biological information to support a proposed rule is lacking.

SSC = CDFG "Species of Special Concern"

CNPS List: **1A** = Presumed Extinct in CA; **1B** = Rare or Endangered in CA and elsewhere; **2** = R/E in CA and more common elsewhere; **3** = Need more information; **4** = Plants of limited distribution.

-- = Species not state-listed.

^b **Source:** 1 = From USFWS letter (Knight 2001, personal communication). 2 = From CNDDDB/ RareFind.

Hispid bird's beak (*Cordylanthus mollis* ssp. *hispidus*)

- **Habitat and Biology:** Annual herb, hemiparasitic; CNPS List 1B; alkaline meadows and playas.
- **Blooming:** June to September
- **Range:** Alameda, Kern, Merced, Placer, and Solano counties.
- **CNDDDB/RareFind Records:** No records for this species on the USGS 7.5-minute San Leandro Quad.
- **Habitat Present in Study Area:** Marginal habitat occurs in alkaline soils in the project site and adjacent stormwater retention pond. Also in playas in Cogswell Marsh and HARD Marsh.

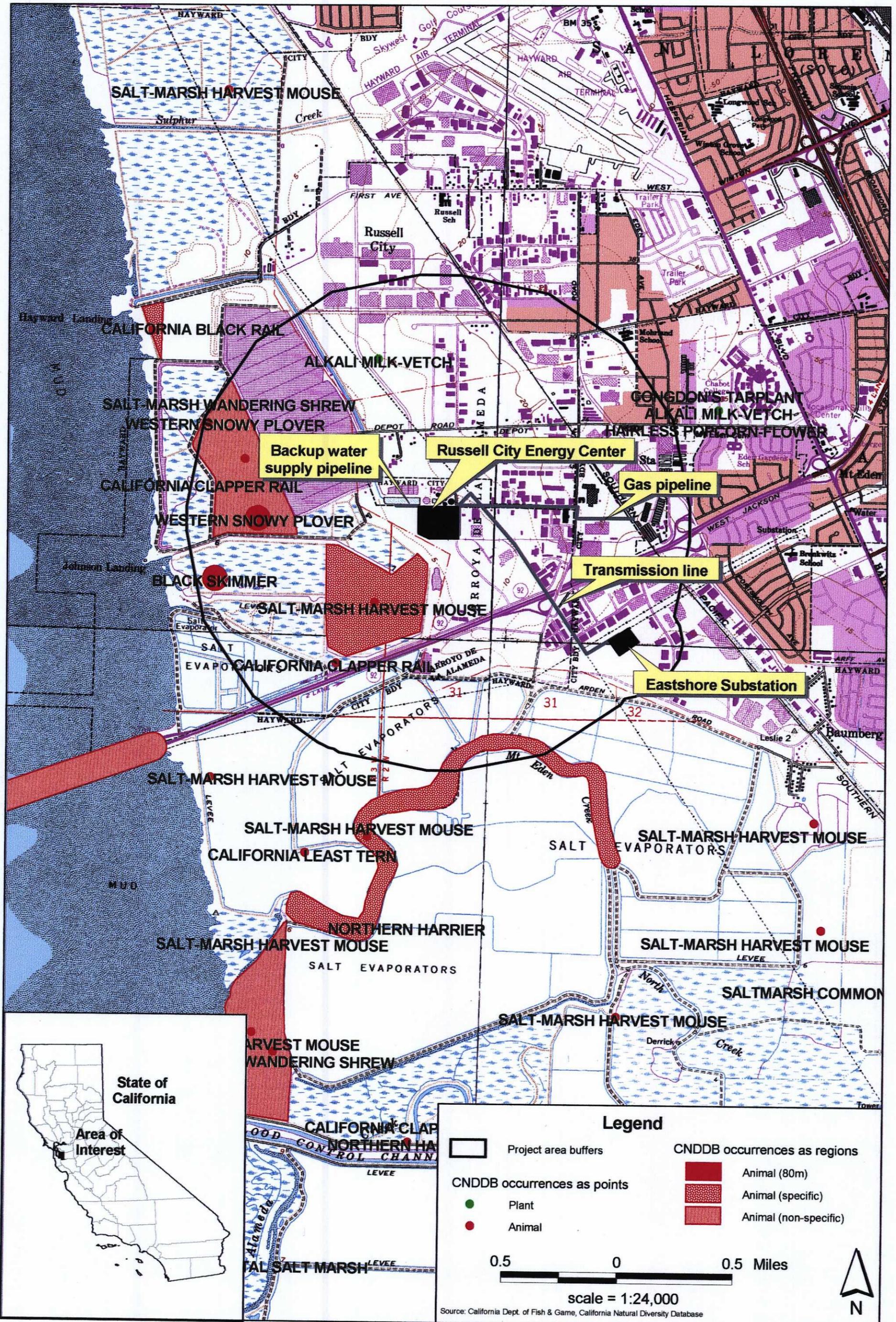


Figure 8.2-2. Location of special status species records within the RCEC project impact area.

Point Reyes bird's beak (*Cordylanthus maritimus* ssp. *palustris*)

- **Habitat and Biology:** Annual herb; Federal SC and CNPS List 1B; found in coastal salt marshes associated with pickleweed, saltgrass, and jaumea.
- **Blooming:** June to October
- **Range:** Restricted to coastal salt marshes in California and Oregon.
- **CNDDDB/RareFind Records:** There are six records for this species on the USGS 7.5-minute Hayward, Newark, Redwood Point, and San Leandro Quads.
- **Habitat Present in Study Area:** Potential habitat for this species occurs in the salt marsh habitats in Cogswell Marsh and HARD Marsh.

Delta tulle pea (*Lathyrus jepsonii* var. *jepsonii*)

- **Habitat and Biology:** Perennial herb; Federal SC, CNPS List 1B; found in brackish marsh (Skinner and Pavlik 1994).
- **Blooming:** May to June
- **Range:** Alameda, Contra Costa, Fresno, Marin, Napa, Sacramento, San Benito, Santa Clara, San Joaquin, and Solano counties.
- **CNDDDB/RareFind Records:** There are no records for this species on the USGS 7.5-minute Hayward, Newark, Redwood Point, and San Leandro Quads.
- **Habitat Present in Study Area:** Potential habitat occurs in brackish/freshwater marshes and sloughs in the western part of the project impact area.

Mason's lilaopsis (*Lilaeopsis masonii*)

- **Habitat and Biology:** Perennial herb; State R, Federal SC, CNPS List 1B; found in brackish marshes, swamp areas, and riparian scrub (Skinner and Pavlik 1994).
- **Blooming:** April to October
- **Range:** South Sacramento Valley and northeast San Francisco Bay.
- **CNDDDB/RareFind Records:** No records on the USGS 7.5-minute San Leandro Quad.
- **Habitat Present in Study Area:** Potential habitat occurs in brackish/freshwater marshes and sloughs in the western part of the project impact area.

Hairless popcorn flower (*Plagiobothrys glaber*)

- **Habitat and Biology:** Annual herb; Federal Endangered and CNPS List 1A; found in meadows, seeps, marshes and swamps. Especially thought to prefer coastal salt marshes and alkaline meadows.
- **Blooming:** April to May
- **Range:** Isolated to alkaline meadows and coastal salt marshes in northern California.
- **CNDDDB/RareFind Records:** There are two records for this species on the USGS 7.5-minute Hayward, Newark, Redwood Point, and San Leandro Quads.
- **Habitat Present in Study Area:** Potential habitat occurs in alkaline soils in the project site.

California seablite (*Suaeda californica*)

- **Habitat and Biology:** Perennial shrub; Federal Endangered and CNPS List 1B; found along margins of coastal salt marshes.
- **Blooming:** July to October
- **Range:** Formerly known from San Francisco Bay area where thought to be extirpated. Currently known from Alameda, San Luis Obispo, and Santa Clara counties.

- **CNDDDB/RareFind Records:** There is one record for this species on the USGS 7.5-minute Hayward, Newark, Redwood Point, and San Leandro Quads.
- **Habitat Present in Study Area:** Marginal habitat occurs along margins of alkaline soils of Cogswell Marsh and HARD Marsh.

Special Status Wildlife Species

Table 8.2-2 lists the special status wildlife species in the vicinity of the RCEC project components, based on CNDDDB/RareFind and USFWS data. Locations of species historically located within 1 mile of the RCEC project components are mapped on Figure 8.2-2. Brief descriptions of special status wildlife species that may occur in the project area are presented below in the following order: mammals, birds, reptiles, amphibians, fish, and invertebrates. Habitat for these species occurs near the project site, but does not occur on the plant site.

Mammals:

Salt-marsh harvest mouse (*Reithrodontomys raviventris*)

- **Habitat and Biology:** Forages on leaves, seeds, and stems of plants that occur in salt marsh habitats. In winter, this species prefers fresh green grasses. Pickleweed and saltgrass are the main food sources (Zeiner 1990). Does not burrow. Builds nests of grass and sedges on the ground.
- **Range:** Restricted to salt marsh habitats around San Francisco Bay.
- **CNDDDB/RareFind Records:** There are 24 records for this species on the USGS 7.5-minute Hayward, Newark, Redwood Point, and San Leandro Quads. Two records occurred within the project vicinity; in the City of Hayward salt marsh southwest of the RCEC plant site, and along Mt. Eden Creek.
- **Nesting/Foraging Habitat Present in Study Area:** Breeding and foraging habitat for this species exists within the salt marsh habitats in Cogswell Marsh, the HARD Marsh, the City of Hayward salt marsh, and Mt. Eden Creek. Brackish marshes and salt evaporating ponds, provide marginal habitat for this species.

Salt-marsh wandering shrew (*Sorex vagrans halicoetes*)

- **Habitat and Biology:** Feeds mainly on invertebrates, insects, worms, snails, slugs, and spiders. Also eats fungi, small mammals, roots, young shoots, and probably seeds. Forages under litter on moist surfaces, underground, and in moist accumulations of dead plant material. Prefers dense litter or ground cover and uses vole runways.
- **Range:** Restricted to salt marsh habitats around San Francisco Bay.
- **CNDDDB/RareFind Records:** There are seven records for this species on the USGS 7.5-minute Hayward, Newark, Redwood Point, and San Leandro Quads. One record occurred within the project vicinity, in the Cogswell Marsh.
- **Nesting/Foraging Habitat Present in Study Area:** Potential habitat for this species occurs in the Cogswell Marsh, the HARD salt marsh, and the City of Hayward Marsh southwest of the project site.

Table 8.2-2. Special status wildlife species evaluated in the RCEC project areas.

Scientific Name	Common Name	Federal/ State ^a	Habitat in impact area?	Source ^b
Mammals				
<i>Corynorhinus townsendii townsendii</i>	Pacific western big eared bat	SC/CSC	No	1
<i>Eumops perotis californicus</i>	Greater western mastiff-bat	SC/CSC	No	1
<i>Myotis evotis</i>	Long eared bat	SC/--	No	1
<i>Myotis thysanodes</i>	Fringed myotis bat	SC/--	No	1
<i>Myotis volans</i>	Long legged myotis bat	SC/--	No	1
<i>Myotis yumanensis</i>	Yuma myotis bat	SC/CSC	No	1
<i>Neotoma fuscipes annectens</i>	San Francisco dusky footed woodrat	SC/CSC	No	1
<i>Reithrodontomys raviventris</i>	Salt-marsh harvest mouse	E/E	Yes	1,2
<i>Sorex vagrans halicoetes</i>	Salt-marsh wandering shrew	SC/CSC	Yes	1,2
Birds				
<i>Accipiter striatus</i> (nesting)	Sharp-shinned hawk	--/SSC	No	2
<i>Agelaius tricolor</i> (nesting colony)	Tricolored blackbird	SC/CSC	No	1,2
<i>Amphispiza belli belli</i>	Bell's sage sparrow	SC/CSC	No	1
<i>Aquila chrysaetos</i> (nesting & wintering)	Golden Eagle	--/SSC	No	2
<i>Ardea herodias</i> (rookery)	Great blue heron	--/--	No	2
<i>Asio flammeus</i> (nesting)	Short-eared owl	--/SSC	No	2
<i>Athene cunicularia hypugea</i> (burrow sites)	Western burrowing owl	SC/CSC	Yes	1,2
<i>Branta canadensis leucopareia</i>	Aleutian Canada goose	T/--	No	1
<i>Buteo regalis</i>	Ferruginous hawk	SC/CSC	Winter foraging	1
<i>Charadrius alexandrinus nivosus</i> (nesting)	Western snowy plover	T/CSC	No	1,2
<i>Circus cyaneus</i> (nesting)	Northern harrier	--/CSC	Yes	2
<i>Elanus leucurus</i> (nesting)	White-tailed kite	--/--	Yes	2
<i>Falco peregrinus anatum</i>	American peregrine falcon	--/E	Yes-foraging	1
<i>Geothlypis trichas sinuosa</i>	Saltmarsh common yellowthroat	SC/CSC	No-foraging	1,2
<i>Haliaeetus leucocephalus</i>	Bald eagle	T/E	No	1,2
<i>Laterallus jamaicensis coturniculus</i>	California black rail	SC/T	No	2
<i>Melospiza melodia pusillula</i>	Alameda song sparrow	SC/CSC	Yes	1
<i>Pelecanus occidentalis californica</i>	California brown pelican	E/E	No	1
<i>Phalacrocorax auritus</i>	Double-crested cormorant	--/SSC	No	2
<i>Rallus longirostris obsoletus</i>	California clapper rail	E/E	No	1,2
<i>Rynchops niger</i>	Black Skimmer	--/SSC	Yes	2
<i>Riparia riparia</i> (nesting)	Bank swallow	--/T	No	2
<i>Sterna antillarum browni</i> (nesting colony)	California least tern	E/E	No	1,2
Reptiles				
<i>Clemmys marmorata marmorata</i>	Northwestern pond turtle	SC/CSC	Marginal	1
<i>Clemmys marmorata pallida</i>	Southwestern pond turtle	SC/CSC	Marginal	1

Table 8.2-2. (continued)

Scientific Name	Common Name	Federal/ State ^a	Habitat in impact area?	Source ^b
Reptiles (cont.)				
<i>Masticophis lateralis euryxanthus</i>	Alameda whipsnake	T/T	No	1,2
<i>Phrynosoma coronatum frontale</i>	California horned lizard	SC/CSC	No	1
Amphibians				
<i>Ambystoma californiense</i>	California tiger salamander	C/CSC	No	1
<i>Rana aurora draytonii</i>	California red legged frog	T/CSC	No	1
<i>Rana boylei</i>	Foothill yellow legged frog	SC/CSC	No	1
Fish				
<i>Hypomesus transpacificus</i>	Delta smelt	T/T	No	1
<i>Oncorhynchus kisutch</i>	Coho salmon	T/E	No	1
<i>Oncorhynchus mykiss</i> *	Central California Valley steelhead	T/E	No	1
<i>Oncorhynchus mykiss</i> *	Central California Coast steelhead	T/E	No	1
<i>Oncorhynchus tshawytscha</i>	Winter run chinook salmon	E/E	No	1
<i>Pogonichthys macrolepotus</i>	Sacramento splittail	PT/CSC	No	1
<i>Spirinchus thaleichthys</i>	Longfin smelt	SC/CSC	No	1
Invertebrates				
<i>Branchinecta lynchi</i>	Vernal pool fairy shrimp	T/--	No	1
<i>Danaus plexippus</i>	Monarch butterfly	--/--	No	2
<i>Hydrochara rickseckeri</i>	Ricksecker's scavenger beetle	SC/--	Marginal	1
<i>Tryonia imitator</i>	Mimic tryonia (California brackishwater snail)	SC/--	Marginal	2

^a **Status Categories:**

Federal status determined from the USFWS letter. State status determined from *State and Federally Listed Endangered and Threatened Animals of California* (January 1999) and *Special Animals* (March 1998), prepared by DFG Natural Diversity Data Base. Codes used in table are as follows:

E = Endangered; **T** = Threatened; **R** = California Rare; **PT** = Proposed Threatened

C = Candidate: Taxa for which the USFWS has sufficient biological formation to support a proposal to list as endangered or threatened.

SC = USFWS Species of Concern: Taxa for which existing information may warrant listing, but for which substantial biological information to support a proposed rule is lacking.

SSC = CDFG "Species of Special Concern"

FP = CDFG "Fully Protected"

CNPS List: **1A** = Presumed Extinct in CA; **1B** = Rare or Endangered in CA and elsewhere; **2** = R/E in CA and more common elsewhere;

3 = Need more information; **4** = Plants of limited distribution.

-- = Species not state-listed.

^b **Source:** **1** = From USFWS letter (Knight 2001, personal communication). **2** = From CNDDDB/ RareFind. **3** = Field observation.

* The *O. mykiss* taxon has an Ecological Significant Unit (ESU) designation, based on genetic isolation resulting from geographic separation.

Birds:

California clapper rail (*Rallus longirostris obsoletus*)

- **Habitat and Biology:** Forages in marsh vegetation, along vegetation and mud flat interface, and along creeks. Along coast, feeds on crab, mussels, clams, snails, insects, spiders, and worms. Will also take mice during high tides. Prefers emergent wetland vegetation dominated by pickleweed and cordgrass, and brackish emergent wetlands dominated by pickleweed, cordgrass, and bulrush. Requires shallow water and mudflats for foraging with adjacent higher vegetation for cover during high water periods.
- **Range:** Locally common year-long in coastal wetlands and brackish areas around San Francisco, Monterey, and Morro bays.
- **CNDDDB/RareFind Records:** There are 11 records for this species on the USGS 7.5-minute Hayward, Newark, Redwood Point, and San Leandro Quads. This species is known to occur in the Cogswell Marsh and the HARD Marsh.
- **Nesting/Foraging Habitat Present in Study Area:** Suitable habitat for this species occurs in the salt marsh and brackish marsh habitats within the study area.

California black rail (*Laterallus jamaicensis coturniculus*)

- **Habitat and Biology:** Occurs most commonly in tidal emergent wetlands dominated by pickleweed, or in brackish marshes supporting bulrushes in association with pickleweed. In freshwater, usually found in bulrushes, cattails, and saltgrass. Usually found in immediate vicinity of tidal sloughs. Typically occurs in high wetland zones near upper limit of tidal flooding, not in low wetland areas with considerable annual and/or daily fluctuations in water levels. During extreme high tides, may depend on upper wetland zone and adjoining upland or freshwater wetland vegetation for cover. Nests are concealed in dense vegetation, often pickleweed, near upper limits of tidal flooding.
- **Range:** Rarely seen, scarce, year-long resident of saline, brackish, and fresh emergent wetlands in the San Francisco Bay area, Sacramento-San Joaquin Delta, at Morro Bay and a few other coastal southern California locations, the Salton Sea area, and the lower Colorado River area.
- **CNDDDB/RareFind Records:** There are five records for this species on the USGS 7.5-minute Hayward, Newark, Redwood Point, and San Leandro Quads. Only one of these records occurred within the project impact area, in the salt marsh near Hayward Landing.
- **Nesting/Foraging Habitat Present in Study Area:** Suitable habitat for this species occurs in the project area in the tidal sloughs in the vicinity of Hayward Landing and Johnson Landing.

Western burrowing owl (*Athene cunicularia hypugea*)

- **Habitat and Biology:** Forages day and night in open dry grassland and desert habitats, and in grass, forb, and open shrub stages of pinyon-juniper and ponderosa pine habitats. Nests in old burrows of ground squirrels or other small mammals. Eats mostly insects; also feeds on small mammals reptiles, birds, and carrion. Short vegetation may increase prey availability, enhance predator detection, and attract burrowing mammals that provide nest sites for burrowing owls. Burrowing owls usually migrate from their nesting site during the winter, but may use their burrow or other burrows as winter shelter. Breeds from March through August. Year-long resident in CA.
- **Range:** Central Valley, Sierra Nevada, and Coast ranges.

- **CNDDDB/RareFind Records:** There are eight records for this species on the USGS 7.5-minute Hayward, Newark, Redwood Point, and San Leandro Quads, none of which occurred within the project impact area.
- **Nesting/Foraging Habitat Present in Study Area:** Suitable nesting and foraging habitat for this species occurs in the Project site.

Reptiles:

Northwestern pond turtle (*Clemmys marmorata marmorata*) and Southwestern pond turtle (*Clemmys marmorata pallida*)

- **Habitat and Biology:** Associated with permanent or nearly permanent water in a wide variety of habitat types, normally in ponds, lakes, streams, irrigation ditches or permanent pools along intermittent streams (Zeiner et al. 1988). Eats aquatic plant material, aquatic invertebrates, fish, and frogs (Nussbaum et al. 1983; Stebbins 1985).
- **Range:** Northwestern pond turtles occur throughout northern California west of the Sierra Nevada (Stebbins 1985). Southwestern pond turtles occur from the San Francisco Bay region, south to northwestern Baja California, chiefly west of the Cascade-Sierran crest (Stebbins 1985).
- **CNDDDB/RareFind Records:** There are no records of either subspecies on the USGS 7.5-minute San Leandro Quad.
- **Nesting/Foraging Habitat Present in Study Area:** Suitable breeding and foraging habitat for this species exists within the emergent wetland habitats in the project vicinity.

8.2.1.9 Field Survey Methods

Biological field surveys for the RCEC project were conducted by biologist Brett D. Hartman on February 27 and March 25, 2001, and on April 24, 2001 by Brett D. Hartman and Dean Carrier (qualifications are presented in Appendix 8.2-C). The area surveyed included a 1-mile radius from the Project site, and at least 1,000 feet in each direction from the electric transmission line, natural gas supply pipeline, and wastewater pipeline rights-of-way centerlines. The Eastshore Substation and surrounding vacant land (site of the substation expansion) (Figure 8.2-3 in map pocket) were also surveyed. This section describes the field survey methods used to determine biological resources that could be affected by project activities and the results of those surveys for each of the project areas.

Additional surveys of the RCEC plant and plant AWT site, will be conducted in the late spring and summer of 2001. These surveys will be necessary to identify endangered and threatened flowering plants and migratory bird species that may not be present or readily identifiable in other seasons.

Vegetation

Vegetation surveys included the following tasks:

- Site surveys to determine the type and location of vegetation communities
- Vegetation mapping
- Preparation of plant lists

Activities associated with the special status plant species surveys included the following:

- Consultation with CDFG and USFWS regarding potential occurrence of state- and federally-listed plant species on or near the project area
- Determination of CNPS status of special status plant species using the CNPS electronic inventory (Skinner and Pavlik 1994)

- Determination of habitat preference and flowering times of special status plant species
- Field surveys of the RCEC and AWT plant site, transmission line corridor and substation extension site, natural gas pipeline route, and water supply and wastewater return pipelines, during February and March of 2001.

A list of plant species observed at the project site and linear facilities during 2001 botanical surveys is presented in Table 8.2-3. Due to their bloom time, certain species with potential habitat in the project area of potential effects could not be surveyed during the time in which this AFC was developed.

Additional surveys will be undertaken in June and July to determine whether or not Hispid's birds beak, Point Reyes bird's beak, or Delta tule pea are present in the project area and would be affected by project construction or operation. Of these, Point Reyes bird's beak and Delta tule pea are true salt marsh or brackish marsh species, or species unlikely to occur in more upland situations such as the RCEC power plant and AWT site. Hispid's bird's beak is more likely to be present than Point Reyes bird's beak or Delta tule pea, since this plant's natural habitat consists of alkaline playas and meadows and the project site contains alkaline soils near brackish marsh. Surveys for this plant could take place in June.

California seablight also has a post-April blooming period, but is a perennial shrub that is identifiable outside of the blooming period.

Wildlife Surveys

Wildlife surveys for the RCEC project were conducted during the spring of 2001 by biologists Brett D. Hartman and Dean Carrier. Wildlife species were observed in the early morning and late afternoon hours at the project site, the open land belonging to Waste Management Corporation and the City of Hayward stormwater retention basin to the south of the power plant site, the Eastshore Substation and surrounding open land, and along the interpretive trails of the Cogswell Marsh and HARD Marsh. Trapping was not conducted for the salt marsh harvest mouse because of the lack of suitable habitat (pickleweed) on site. Habitat evaluation is the standard method for identifying the likely presence or absence of this species due to the unreliability of trapping as an indicator (Dan Buford, U.S. Fish and Wildlife Service, personal communication, April 30, 2001).

A list of wildlife species observed during surveys of the project site and associated facilities is provided in Table 8.2-4.

Wetland Delineation

A wetland delineation was performed for the RCEC and AWT plant site. Standard methodology as defined in the Corps of Engineers Wetlands Delineation Manual (1987) was used.

Wetland delineation included the following tasks:

- Review of available data on the site, including: National Wetlands Inventory map for the San Leandro quadrangle; Soil Survey of Alameda County, CA, Western Part (1981); and Hayward Shoreline Environmental Enhancement Program (HASPA, 1993)
- Field surveys of the project site on February 28, 2001, and completion of wetland data forms (Appendix 8.2-D)
- Aerial photo interpretation and delineation of wetlands on a 1-foot contour topographic map
- Consultation and field verification of the wetland delineation with Mark D'Ávignon of the Army Corps of Engineers, San Francisco District, on April 24, 2001

Table 8.2-3. Plant species observed during botanical surveys for the RCEC project.

Family	Genus	Species/ subspecies/ variety	NI/	Common name	Power plant and AWT site	Natural Gas & Water Pipelines
DICOTS						
Apiaceae	<i>Foeniculum</i>	<i>vulgare</i>	I	Fennel		
Asteraceae	<i>Coryza</i>	<i>canadensis</i>	I	Horseweed	✓	
	<i>Baccharis</i>	<i>pilularis</i>	N	Coyote brush	✓	
	<i>Cotula</i>	<i>coronopifolia</i>	I	Brassbuttons	✓	
	<i>Grindelia</i>	<i>stricta</i> var. <i>angustifolia</i>	N	Gumweed		
	<i>Sonchus</i>	<i>oleraceus</i>	I	Common sow thistle	✓	✓
Brassicaceae	<i>Brassica</i>	<i>nigra</i>	I	Black mustard	✓	✓
Chenopodiaceae	<i>Chenopodium</i>	<i>album</i>	I	Lamb's quarters		
	<i>Salicornia</i>	<i>virginica</i>	N	Pickleweed	✓	
Fabaceae	<i>Lathyrus</i>	Sp.	N	Wild pea	✓	
Frankeniaceae	<i>Frankenia</i>	<i>salina</i>	N	Alkali heath	✓	
Geraniaceae	<i>Geranium</i>	<i>molle</i>	I	Wild geranium	✓	✓
	<i>Erodium</i>	<i>cicutarium</i>	I	Filaree	✓	✓
Malvaceae	<i>Malva</i>	<i>nicaeensis</i>	I	Bull mallow	✓	
Myrtaceae	<i>Eucalyptus</i>	<i>globulus</i>	I	Blue gum	✓	
Papaveraceae	<i>Eschscholzia</i>	<i>californica</i>	N	California poppy		
Plantaginaceae	<i>Plantago</i>	<i>lanceolata</i>	I	English plantain	✓	✓
Polygonaceae	<i>Rumex</i>	<i>crispus</i>	I	Curly dock	✓	
Primulaceae	<i>Anagallis</i>	<i>arvensis</i>	I	Scarlet pimpernell		
Solanaceae	<i>Nicotiana</i>	<i>glauca</i>	I	Tree tobacco		
Urticaceae	<i>Urtica</i>	<i>urens</i>	I	Dwarf nettle		
MONOCOTS						
Poaceae	<i>Avena</i>	<i>fatua</i>	I	Wild oat	✓	✓
	<i>Bromus</i>	<i>dianthus</i>	I	Ripgut grass	✓	
	<i>Cortadaria</i>	Sp.	I	Pampas grass		
	<i>Cynodon</i>	<i>dactylon</i>	I	Bermuda grass		✓
	<i>Distichlis</i>	<i>spicata</i>	N	Saltgrass	✓	
	<i>Elymus</i>	sp.		Wild-rye	✓	
	<i>Hordeum</i>	<i>murinum</i> ssp. <i>leporium</i>	I	--		
	<i>Lotium</i>	<i>multiflorum</i>	I	Italian ryegrass	✓	✓
	<i>Vulpia</i>	<i>microstachys</i>	N	Three-week fescue	✓	
Juncaceae	<i>Scirpus</i>	sp.		Rush	✓	

8.2.1.10 RCEC Plant Site Survey

The project site is bordered on the north by Enterprise Avenue and the City of Hayward Water Pollution Control Facility (or WPCF), on the east by Whitesell Street and the Mag Trucking terminal, on the south by an Alameda County Flood Control District stormwater channel and City of Hayward stormwater retention pond, and on the west by a warehouse and truck terminal/distribution center. Figure 8.2-3 (in map pocket) shows biological resources noted within 1 mile of the plant site and 1,000 feet of the project linear facilities.

Table 8.2-4. Wildlife species observed during 2001 wildlife surveys.

Common Name	Power plant And AWT site	Transmission line	Natural gas pipeline
Alameda song sparrow	✓		
Avocet	✓	✓	✓
Barn swallow	✓		
Black-necked stilt	✓		
Brewer's blackbird	✓	✓	✓
Canada goose	✓		
Common Crow	✓	✓	✓
Common raven	✓	✓	
Cormorant (in flight)	✓		
Killdeer	✓		
Oadwall	✓		
Great egret	✓		
Least sandpiper	✓		
Long-billed dowitcher	✓		
Mallard	✓		
Mourning dove	✓	✓	✓
Northern harrier	✓		
Red-winged blackbird	✓	✓	
Red-tailed hawk	✓		
Rock dove	✓	✓	✓
Ruddy duck	✓	✓	✓
Stacilia	✓		
Turkey vulture			
Western Gull	✓		
Western meadowlark	✓		

Vegetation

The project plant site is dominated by business/industrial development, annual grassland, and seasonal wetland vegetation (in addition to the industrial activities at the Runnels Industries parcel). Table 8.2-5 lists the approximate acreage of habitat types at the plant site. Annual grassland vegetation is dominated by introduced annual grasses such as ripgut brome (*Bromus diandrus*) and Italian wild rye (*Lolium multiflorum*), and ruderal species such as black mustard (*Brassica nigra*), bullmallow (*Malva nicaeensis*), and filaree (*Erodium cicutarium*). Two native grass species are present: three-week fescue

(*Vulpia microstachys*) and wild barley (*Hordeum leporinum*), with coyote brush (*Baccharis pilularis*) along the borders of the property.

Table 8.2-5. Habitat types affected at the Project site.

Habitat type	Acres
Open industrial lot (Runnels Industries)	3.6
Grassland/ruderal areas	9.4
Wetland vegetation	1.7
Totals	14.7

Seasonal wetland vegetation on the project site is dominated by salt-tolerant species such as saltgrass (*Distichlis spicata*) and alkali heath (*Frankenia salina*), with curly dock (*Rumex crispus*), Italian ryegrass (*Lolium multiflorum*), wildrye (*Leymus* sp.) and spikerush (*Eleocharis* sp.) as associates. The City of Hayward's stormwater retention pond, located southwest of the project site, is dominated by pickleweed (*Salicornia virginica*) and brass buttons (*Cotula coronopifolia*), intermixed with uplands dominated by Italian ryegrass (*Lolium multiflorum*) and other ruderal species.

Wildlife

Wildlife species observed foraging at the Project site and adjacent stormwater retention pond included Canada geese, red-winged blackbirds, western gulls, mallards, and least sandpipers. Black-tailed jackrabbits and ground squirrel burrows and runs were noted, with several apparently unoccupied burrow holes in the embankment to Enterprise Avenue on the northern end of the property. No burrowing owls were observed during surveys nor was there evidence of burrowing owl activity at the burrow sites. No mounds suitable for burrowing owl use were found elsewhere on the property.

Wetlands

The project site is mapped as palustrine, emergent, temporarily flooded, diked/impounded wetland. The soils are mapped as Reyes Clay, drained. These are very deep, poorly drained soils on tidal flats. The water table has been lowered to a depth of about four feet. There are eight small ponded areas that meet the soils, hydrology, and vegetation criteria of jurisdictional wetlands (subject to Corps of Engineers regulation under the Clean Water Act). However, field surveys revealed that substantial portions of the property have been filled, or are Willows Clay, drained. These are very deep, poorly drained soils on basin rims. These upland areas did not meet the criteria to be classed as wetlands. Figure 8.2-4 shows a wetland delineation of the RCEC and AWT project site. Wetlands were found in eight separate areas that totaled 1.68 acres. The U.S. Army Corps of Engineers, San Francisco District, verified the wetland delineation conducted for the property in the field on April 24, 2001.

The stormwater retention pond near the project site to the south, while cut off from tidal influence, retains remnant elements of the transitional zone between the northern coastal salt marsh community and adjacent uplands. The area is characterized by small mud flats intermixed with upland areas dominated by ruderal species. Hydrologic inputs to the system include overflow from the Alameda Flood Control channel that runs south of the site, and runoff from the Project site.

Electric Transmission Line and Eastshore Substation Expansion

The electric transmission line corridor traverses urban areas and parking lots for most of the route and will not affect biological or wetland resources. The substation is located in a lot dominated by ruderal

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species. Ruderal vegetation includes non-native species that colonize disturbed areas, including disturbed margins around salt marsh habitats. Ruderal species include annual non-native species such as wild oat (*Avena fatua*), ripgut grass (*Bromus diandrus*), Italian rye grass (*Lolium multiflorum*), and tarplant (*Hemizonia* sp.).

Natural Gas Pipeline

The natural gas transmission line corridor runs in Enterprise Avenue, crosses Clawiter Road, and then runs in a gravel-covered right-of-way through the Berkeley Farms facility. There are no biological or wetland resources located along this route.

Wastewater Return Pipeline

The proposed pipeline will be installed within Enterprise Avenue and will not affect biological or wetland resources. This area is dominated by horticultural trees and shrubs, and ruderal vegetation. Ruderal species include annual non-native species such as wild oat (*Avena fatua*), ripgut grass (*Bromus diandrus*), and Italian rye grass (*Lolium multiflorum*).

Construction Laydown and Worker Parking Areas

Two of the proposed construction laydown areas are currently truck parking terminals with little or vegetation or wildlife habitat. As mentioned above, the open land surrounding the Eastshore substation dominated by ruderal species. Ruderal vegetation includes non-native species that colonize disturbed areas, including disturbed margins around salt marsh habitats. Ruderal species include annual non-native species such as wild oat (*Avena fatua*), ripgut grass (*Bromus diandrus*), Italian rye grass (*Lolium multiflorum*), and tarplant (*Hemizonia* sp.).

8.2.1.11 AWT Plant Site Survey

The AWT plant will be situated adjacent to the RCEC plant site and consists of the same types of vegetation, wildlife, and wetlands habitats. Impacts to these biological resources are the same as those projected for the RCEC plant site.

8.2.2 Environmental Consequences

8.2.2.1 Significance Criteria

Potential direct and indirect project impacts to biological resources associated with construction, operation, and maintenance of the RCEC were evaluated. An impact would be considered significant if it resulted in the take of a listed species or its habitat; resulted in take of sensitive species or its habitat that jeopardized its viability, either locally or range-wide; or resulted in loss of species or populations necessary to maintain current distribution.

8.2.2.2 RCEC Plant Site

Construction of the RCEC footprint will result in the permanent loss of approximately 9.4 acres of disturbed ruderal vegetation and approximately 1.68 acres of jurisdictional wetlands (Table 8.2-5). No special status plant species were found at the RCEC plant site and none will be affected by construction of the plant. Construction of this project will likely result in the loss of individuals of several wildlife species occupying this site or dependent upon this site for specific physiological and ecological requirements. However, these species have no special protection status, are common to many areas, and are primarily limited to burrowing rodents (i.e., ground squirrel [*Spermophilus* sp.], pocket gophers [*Thomomys* sp.] and voles [*Microtus* sp.]). Due to the existing level of traffic on Enterprise Avenue, and

the low level of wildlife use in this highly urbanized area, construction traffic is not expected to result in increased wildlife road kills. Noise and activity from construction activities will have a negligible and temporary effect on wildlife use of this area.

Electric Transmission Line and Eastshore Substation Expansion

Upgrading of the electric transmission line is not expected to have a significant effect on biological or wetland resources. The project would involve constructing new transmission support towers and adding new conductors. The 1.1-mile route traverses existing areas within the Hayward Industrial Corridor.

Natural Gas Pipeline

Construction of the natural gas pipeline is not expected to result in any significant and long-term effects on biological resources. The pipeline route runs in Enterprise Avenue and under a graveled pipeline right-of-way on the Berkeley Farms property.

Wastewater Return Pipeline

Construction of the wastewater return line would not result in any significant and long-term effects on biological resources. This pipeline runs approximately 260 feet across Enterprise Avenue from the RCEC power plant site under existing paved streets.

Construction Laydown and Worker Parking Areas

Construction laydown and worker parking would not have significant effects on biological or wetland resources, since the trucking terminals on Depot and Enterprise are devoid of vegetation and the open land surrounding the Eastshore Substation consists of ruderal vegetation and does not contain wetlands or biological resources.

AWT Plant

The same impacts projected for the RCEC plant site also apply to the AWT plant. The backup water cooling supply pipeline runs in the WPCF's access pad, and would not affect biological resources. Other pipelines to and from the AWT (water supply, RO waste, microfiltration waste, and stormwater runoff), also run under paved areas.

8.2.2.3 Operation Phase Impacts

RCEC Plant Site

Once constructed and operational, the facility will have a minimal effect on wildlife resources in the area. Trees and shrubs planted for landscape screening around the RCEC, and the RCEC architectural treatment structures themselves, could provide perching or nesting sites for raptorial birds (hawks and falcons) and egg predators (crows and ravens). These could, in turn, use the facility as a base for predation against sensitive species living nearby (such as salt marsh harvest mouse, least tern, etc.). This potential effect could be easily controlled, however, by limiting trees planted to smaller species or species that do not provide strong support for large nests, and by installing devices on possible perching places at the power plant (for example, on the architectural screen) that would discourage raptorial birds from perching.

Operation of the RCEC would produce some noise, as described in Section 8.7 (Noise). Due to the close proximity of existing industrial plants, city streets, and railroad tracks, the noise generated during operation of the RCEC facility is not expected to boost noise levels to a degree that would significantly affect wildlife in the vicinity of the plant. Current noise levels at the site are well above those of more

isolated examples of natural salt marsh, yet species appear to have habituated to it. Elimination of some current facilities causing noise (i.e., the sand-blasting operation) may compensate somewhat for increased noise from the facility itself.

Human activity at the facility should have no significant affect on the adjacent salt marsh habitats as long as screening is provided. Lighting would be designed to reduce glare (Section 8.13, Visual Resources).

Electric Transmission Line and Eastshore Substation Expansion

Potential effects of additional electric transmission conductors on bird species utilizing this area could include collision and electrocution. These effects would likely continue throughout the life of the facility. There is no evidence, however, that this is currently a significant problem or that additional conductors on an existing transmission line would increase mortality to a level of significance. Bird collisions with electric conducting wires occur when the birds are unable to see the lines, especially during fog and rain events, and if flushed suddenly from the ground. Factors that affect the risk of collision include weather conditions, behavior of the species of bird, and location of the line. The transmission line that will be upgraded is currently almost entirely located in an urban, developed area.

Natural Gas Pipeline

Operation of the gas pipeline would not result in impacts to special status plants, animals, or wetlands unless a leak occurred. A rupture or leakage of the pipeline could result in reduced air quality and, in severe cases, a fire, but any potential effects on native vegetation or wildlife, would be temporary.

Wastewater Return Pipeline

Operation and maintenance of the wastewater return line would not affect biological resources. This pipeline runs approximately 260 feet across Enterprise Avenue from the RCEC under existing paved streets.

Construction Laydown and Worker Parking Areas

Construction laydown and worker parking areas would return to their pre-construction uses after construction is completed. Hence, there would be no operation impacts.

AWT Plant

Once constructed and operational, the facility will have a minimal effect on biological resources in the area.

8.2.2.4 Potential Stack Emission Effects on Soil and Vegetation

Emissions from the HRSG stacks and cooling tower drift will not significantly affect vegetation and soils surrounding the RCEC project area. The following paragraphs present the results of an analysis of the HRSG stack and cooling tower emissions for the RCEC project. The AWT plant will not produce any emissions of concern.

The purpose of this analysis is to evaluate the potential detrimental effects that the projected HRSG stack and cooling tower emissions from the RCEC plant site will have on surrounding vegetation. Potential pollutant stack emissions included in this analysis include carbon monoxide (CO), inhalable particulates (PM₁₀), and oxides of nitrogen and sulfur (NO_x and SO₂). No pollutant emissions are predicted to result in concentrations exceeding the U.S. Environmental Protection Agency (USEPA) prevention of significant deterioration (PSD) significant impact levels, for either short-term or annual averaging

periods for CO, PM₁₀, NO_x, and SO₂. Table 8.2-6 presents the total maximum impact concentrations for the RCEC project, as discussed in Section 8.1 (Air Quality).

Table 8.2-6. RCEC operational effects from HRSG stack and cooling tower emissions.

Pollutant	Averaging Period	Maximum Project Concentration ¹ (µg/m ³)	State Ambient Air Quality Standards (µg/m)
CO	1-hour	7671	23,000
	8-hour	3847	10,000
NO _x	1-hour	376	470
	Annual	42	100
SO ₂	1-hour	125	650
	3-hour	56	1,300
	24-hour	19	109
	Annual	5.3	80
PM ₁₀	24-hour	92	50
	Annual	24.5	30

¹Maximum project concentrations include representative background concentrations
µg/m³ = micrograms per cubic meter

Carbon Monoxide

Plants metabolize and produce carbon monoxide (CO). Few studies on thresholds for detrimental effects on vegetation have been conducted. Most available studies use very high CO concentrations (above 100 parts per million [ppm]). Soil microorganisms probably acts as a buffering system and sink for CO. There are no known detrimental effects on plants due to CO concentrations of 10,000 to 230,000 µg/m³ (USEPA 1979).

Zimmerman et al. (1989) exposed a variety of plant species to CO at concentrations of 115,000 µg/m³ to 11,500,000 µg/m³ from 4 to 23 days. While practically no growth retardation was noted in plants exposed at the lower level, retarded stem elongation and leaf deformation were observed at the higher concentrations. Pea and bean seedlings also exhibited abnormal leaf formation after exposure to CO at 27,000 µg/m³ for several days (USEPA 1979).

Comparatively low levels of CO in the soil have been shown to inhibit nitrogen fixation. Concentrations of 113,000 µg/m³ have been shown to reduce nitrogen fixation, while 572,000 to 1,142,000 µg/m³ result in nearly complete inhibition (USEPA 1979).

Maximum predicted 1-hour and 8-hour CO emissions have been calculated from the RCEC HRSG exhaust stack. The maximum 1-hour CO concentration is 1231 µg/m³. Adding this impact to the maximum 1-hour CO background concentration of 6440 µg/m³, measured at the nearest monitoring station results in a total predicted 1-hour CO concentration of 7671 µg/m³. This figure is significantly less than the CO concentration of 115,000 µg/m³ determined to result in minimal growth retardation in plants, as well as the 113,000 µg/m³ concentration found to result in slight reduction of nitrogen fixation. Therefore, predicted CO emission levels from the RCEC are not expected to result in adverse effects on vegetation.

Sulfur Dioxide and Nitrogen Oxides

SO₂ and NO_x are the major airborne pollutants of concern for the RCEC project. The extent of their effect on soils and vegetation would be directly related to a variety of factors, including wind speed, direction and frequency, air temperature, humidity, the geomorphology of the area, and the location of the proposed project in relation to sensitive plant communities in the zone of impact.

Sulfur dioxide tends to convert to sulfite and sulfate during chemical transformation in soils. Interpretation of the results of investigations published to date has engendered considerable controversy due to the complexity of terrestrial ecosystems. However, the effects of acidified precipitation containing sulfate (SO₄) on terrestrial ecosystems have been investigated with respect to alteration of soil chemistry as it relates to vegetation health. High levels of SO₄ may reduce soil pH, thereby decreasing the availability of certain essential nutrients and increasing the concentrations of soluble aluminum, which reduces plant growth.

In soils where nitrate-nitrogen is not limiting plant growth, excess nitrate may percolate through the soil column, carrying base cations and exerting an acidifying effect. Increased atmospheric contributions of nitrate may influence vegetation in a species-specific way, with some species taking advantage of its fertilizing characteristics while others (such as those occurring in nitrogen-limited soils) are adversely affected.

Sulfur is a major plant nutrient and can be directly absorbed into the soil. Therefore, an increase in SO₂ in the soil (particularly at levels below threshold limits) would not have an adverse effect on vegetation.

SO₂ can affect vegetation directly (as a gas) or indirectly by means of its principal reaction product, SO₄ (e.g., acidification of soils). In addition, a third mechanism of impact is the formation of acid mist. Direct effects of injury can be manifested as foliar necrosis, decreased rates of growth or yield, predisposition to disease, and reduced reproductive capacity.

Environmental factors, such as temperature, light, humidity, and wind speed, influence both the rate of gas absorption and the plant physiological response to absorbed quantities. The higher the humidity, the higher the absorption of gases. Exposure duration and frequency are also important factors that determine the extent of injuries.

Guidelines for air emission impact assessment provided in the technical literature are diverse and threshold dosages required to cause injury are extremely variable. This is due to the variety of factors affecting plant responses to phytotoxic gases. Consequently, in cases where emissions are below lower threshold limits, decreased yields can result in the absence of visible injury (Sprugel et al. 1980) and long-term impacts should be addressed.

Among the different published attempts to define SO₂ thresholds for vegetation effects, two represent worst-case situations. Loucks et al. (1980) presented threshold ranges between 131 µg/m³ and 262 µg/m³ SO₂, and McLaughlin (1981) suggested values of 1310 µg/m³ SO₂ for the 1-hour average and 786 µg/m³ for the 3-hour average.

According to the dose-injury curve for SO₂-sensitive plant species provided by the USFWS (1978), the lowest 3-hour concentration expected to cause injury to plants is approximately 390 µg/m³, which is significantly higher than the projected emissions from the RCEC. However, these predicted values are applicable only when plants are growing under the most sensitive environmental conditions and stage of maturity. Thresholds for chronic plant injury by SO₂ have been estimated at about 130 µg/m³ on an

annual average (USFWS 1978). The maximum annual average concentration modeled for this project ($0.02 \mu\text{g}/\text{m}^3$) is far below the USFWS threshold for chronic exposure, and the worst-case projected 3-hour maximum of about $3.67 \mu\text{g}/\text{m}^3$ is substantially below the McLaughlin protection level of $786 \mu\text{g}/\text{m}^3$. Consequently, the projected concentration of SO_2 is not expected to cause visible foliar injury or significant adverse chronic effects.

Nitrogen dioxide is potentially phytotoxic, but generally at exposures considerably higher than those resulting from most industrial emissions. Exposures for several weeks at concentrations of 280 to $490 \mu\text{g}/\text{m}^3$ can cause decreases in dry weight and leaf area, but 1-hour exposures of at least $18,000 \mu\text{g}/\text{m}^3$ are required to cause leaf damage. The modeled maximum RCEC emissions of NO_2 impacts of $0.36 \mu\text{g}/\text{m}^3$ are far below these threshold limits ($219.0 \mu\text{g}/\text{m}^3$ or 0.1169 ppm). In addition, the total predicted maximum 1-hour NO_2 concentrations of $169 \mu\text{g}/\text{m}^3$ would be significantly less than the 1-hour threshold ($7,500 \mu\text{g}/\text{m}^3$ or 3,989 ppm) for 5 percent foliar injury to sensitive vegetation (USEPA 1991). This indicates that NO_x emissions from the RCEC, when considered in the absence of other air pollutants, would not adversely affect vegetation.

Airborne Particulates

Particulate emissions will be controlled by inlet air filtration and use of natural gas. The deposition of airborne particulates (PM_{10}) can affect vegetation through either physical or chemical mechanisms. Physical mechanisms include the blocking of stomata so that normal gas exchange is impaired, as well as potential effects on leaf adsorption and reflectance of solar radiation. Information on physical effects is scarce, presumably in part because such effects are slight or not obvious except under extreme situations (Lodge et al. 1981). Studies performed by Lerman and Darley (1975) found that particulate deposition rates of $365 \text{ g}/\text{m}^2/\text{year}$ caused damage to fir trees, but rates of $274 \text{ g}/\text{m}^2/\text{year}$ and $400\text{-}600 \text{ g}/\text{m}^2/\text{year}$ did not damage vegetation at other sites.

The maximum annual predicted concentration for PM_{10} from the RCEC is $0.22 \mu\text{g}/\text{m}^3$. Assuming a deposition velocity of 2 cm/sec (worst-case deposition velocity, as recommended by the California Air Resources Board [CARB]), this concentration converts to an annual deposition rate of $0.14 \text{ g}/\text{m}^2/\text{year}$, which is several orders of magnitude below that which is expected to result in injury to vegetation (i.e., $365 \text{ g}/\text{m}^2/\text{year}$). The addition of the maximum predicted annual particulate deposition rate for the RCEC to the maximum background concentration of $24.3 \mu\text{g}/\text{m}^3$, measured at the nearest monitoring station yields a total estimated particulate deposition rate of $15.5 \text{ g}/\text{m}^2/\text{year}$, utilizing the 2 cm/sec factor. This total is still approximately one order of magnitude less than levels expected to result in plant injury.

The primary chemical mechanism for airborne particulates to cause injury to vegetation is by trace element toxicity. Many factors may influence the effects of trace elements on vegetation, including temperature, precipitation, soil type, and plant species (USFWS 1978). Trace elements adsorbed to particulates emitted from power plant emissions reach the soil through direct deposition, the washing of plant surfaces by rainfall, and the decomposition of leaf litter. Ultimately, the potential toxicity of trace elements that reach the root zone through leaching will be dependent on whether the element is in a form readily available to plants. This availability is controlled in part by the soil cation exchange capacity, which is determined by soil texture, organic matter content, and kind of clay present. Soil pH is also an important influence on cation exchange capacity; in acidic soils, the more mobile, lower valence forms of trace metals usually predominate over less mobile, higher valence forms. The silty clay and clay soils located in the RCEC project area will have a lower potential for trace element toxicity due to the comparatively high soil pH commonly found in bay soils.

Perhaps the most important consideration in determining toxicity of trace elements to plants relates to existing concentrations in the soil. Several studies have been conducted relating endogenous trace element concentrations to the effects on biota of emissions from model power plants (Dvorak et al. 1977, Dvorak and Pentecost et al. 1977, Vaughan et al. 1975). These studies revealed that the predicted levels of particulate deposition for the area surrounding the model plant resulted in additions of trace elements to the soil over the operating life of the plant which were, in most cases, less than 10 percent of the total existing levels. Therefore, uptake by vegetation could not increase dramatically unless the forms of deposited trace elements were considerably more available than normal elements present in the soil.

Cooling Tower Discharges

Contaminants within the RCEC cooling tower drift are expected to consist almost entirely of the minerals that are not removed by the AWT process. Metals and other chemicals of concern will be neutralized and removed from the cooling tower makeup water before it is introduced into the plant cooling water system.

PM₁₀ emissions from the HRSG stacks and cooling towers were calculated for the RCEC. The maximum annual deposition rate for the RCEC of 0.14 g/m²/year is several magnitudes below that which is expected to result in mechanical injury to vegetation (i.e., 365 g/m²/year; see previous discussion on airborne particulates; Lerman and Darley 1975).

Various salts from cooling water and the pH neutralizing process (Table 8.15-3) are expected to be in the cooling tower water. These low levels of salts are not expected to result in injury to the surrounding environment. Pahwa and Shipley (1979) exposed vegetation (corn, tobacco, and soybeans) to varying salt deposition rates to simulate drift from cooling towers that use saltwater (20-25 parts per thousand) circulation. Salt stress symptoms on the most sensitive crop plants (soybeans) were barely perceptible at a deposition rate of 2.98 g/m²/year (Pawha and Shipley 1979). Using an assumption that 100 percent of the airborne particulates from the RCEC emissions produce salts in the cooling tower drift, the calculated deposition rate of 0.14 g/m²/year (which includes HRSG stack emissions) is more than one order of magnitude below the deposition rate that was shown to cause barely perceptible vegetation stress from salt mist. This highly conservative estimate of deposition and the fact that the RCEC cooling tower will use fresh water makes this evaluation much overstated. Therefore, cooling tower drift is not expected to have any impact on vegetation in surrounding habitats within the maximum impact radius for the RCEC cooling tower drift.

8.2.2.5 Wastewater Discharges

When the plant is operating at full capacity, approximately 3.33 million gallons of secondary effluent wastewater per day will be pumped through the cooling water supply pipeline from the City of Hayward Water Pollution Control Facility and treated to tertiary quality in the AWT. Almost half of the water eventually ends up in the cooling tower effluent. Effluent from the cooling tower blowdown will be returned to the Water Pollution Control Facility via the wastewater return pipeline. During normal operating conditions, the RCEC will discharge 53 gallons per minute (0.076 million gallons per day) and at peak conditions, approximately 66 gallons per minute (0.095 million gallons per day) will be discharged to the wastewater return pipeline. The City of Hayward discharges this effluent through the East Bay Dischargers Authority (EBDA) pipeline to the EBDA outfall in San Francisco Bay near the Oakland Airport. The RCEC project thus provides a net benefit to water quality in San Francisco Bay by

reducing the amount of freshwater effluent discharged to the Bay, without increasing the pollutant loading of the water discharged.

8.2.3 Cumulative Impacts

The RCEC project would not result in significant cumulative effects on special status plants, natural plant communities, wetlands, or wildlife. Though the project would result in a permanent loss of 1.68 acres of seasonal wetlands, this loss would be mitigated by replacement or enhancement of equal or larger quantity of better quality wetlands in the general project area, a net benefit to the environment. There would be no permanent loss of special status plants or sensitive wildlife habitats. As a result, the project is not expected to result in any significant cumulative impacts to biological resources.

8.2.4 Proposed Mitigation Measures

The following mitigation measures would ensure that any potentially significant project environmental impacts to biological resources would be mitigated below the threshold of significance.

- The project will require an individual permit from the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act, to fill the 1.68-acres of seasonal wetlands on site. The permit application will include a mitigation plan that identifies how the seasonal wetlands will be replaced in kind, either through a mitigation bank, by purchase of wetland property and dedication of a conservation easement for that property, or by support of wetland and wildlife habitat restoration efforts in the project area. The mitigation plan will be developed in consultation with the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, and San Francisco Bay Regional Water Resources Control Board.
- Wetlands adjacent to the construction site (the parcels south of the RCEC site) will be avoided. A Stormwater Pollution Prevention Plan (SWPPP) will be developed to ensure sediment from the project site does harm not any adjacent wetland areas. Mitigation measures in the SWPPP will include the implementation of silt fence and other sediment control measures, and temporary fencing to ensure entry into sensitive salt marsh communities is avoided. This will be especially important on the southern boundary of the project construction area. Temporary fencing will be implemented to ensure entry into sensitive salt marsh areas south of the project site or other wildlife habitats is avoided.
- Monitoring of construction activities will be carried out by personnel trained to detect any potential and unforeseen impacts on listed, sensitive, or migratory wildlife and their habitats adjacent to the project site. If actual or potential effects are detected, the construction foreman will cease the activities that are potentially affecting these species and will consult with a professional biologist qualified to assess the situation and make recommendations to alter or alleviate any activities that are resulting in these effects.

Project biologists will conduct additional field surveys in June for the Hispid's birds beak, Point Reyes bird's beak, and Delta tule pea. In the event that these plants are identified on site during their blooming phases, additional consultation with regulatory agencies and mitigation planning will be undertaken to ensure that any potential impact to these species is mitigated to a level below significance.

8.2.5 Applicable Laws, Ordinances, Regulations, and Standards

Table 8.2-7 describes the applicable laws, ordinances, regulations, and standards (LORS) pertaining to biological resources for the RCEC project.

Table 8.2-7. Laws, ordinances, regulations, and standards.

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance (Section)
Federal					
Endangered Species Act of 1973 and implementing regulations, Title 16 United States Code (USC) §1531 et seq. (16 USC 1531 et seq.), Title 50 Code of Federal Regulations (CFR) §17.1 et seq. (50 CFR 17.1 et seq.).	Designates and protects federally threatened and endangered plants and animals and their critical habitat.	USFWS and NMFS	Issues letter of concurrence after review of mitigation measures. Issues Biological Opinion (BO) with Conditions after review of BA.	Applicant currently engaged in informal consultation with USFWS. Letter of concurrence will be obtained prior to construction. Section 7 consultation may not be required.	Figure 8.2-1a & b 8.2.1.2 8.2.1.4 Table 8.2-1 8.2.2.2 8.2.5.2
Section 7 of Fish and Wildlife Coordinating Act, 16 USC 742 et seq., 16 USC 1531 et seq., and 50 CFR 17.	Requires consultation if any project facilities could jeopardize the continued existence of an endangered species. Applicability depends on federal jurisdiction over some aspect of the project.	USFWS	Issues BO with Conditions after review of BA.	Applicant currently engaged in informal consultation with USFWS. Letter of concurrence will be obtained prior to construction.	8.2.1.4 8.2.5.2
Section 10(1)(A) of the ESA	Requires a permit to "take" threatened or endangered species during lawful project activities. If no federal nexus for project, a Habitat Conservation Plan (HCP) may be necessary.	USFWS	USFWS issues a Section 10(1)(A) Federal Fish and Wildlife Permit and/or HCP approval.	N/A	8.2.2.1 8.2.5.2
Section 404 of Clean Water Act of 1977 (33 USC 1251 et seq., 33 CFR §§320 and 323).	Gives the USACE authority to regulate discharges of dredge or fill material into waters of the United States, including wetlands.	USACE	Individual permit to fill wetlands adjacent to tidal waters on the RCEC project site.	PCNs to be developed describing the project and wetland mitigation measures, permits to be obtained before construction in wetlands.	8.2.2.1 8.2.2.2 8.2.3.1 8.2.5.2

Table 8.2-7. (continued)

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance (Section)
Section 401 of Clean Water Act of 1977.	Requires the applicant to conduct water quality impact analysis for the project when using 404 permits and for discharges to waterways.	CRWQCB	Water Quality Certification	Water quality analysis currently being conducted, Certification to be obtained before construction begins in 2002.	8.2.3.1 8.2.5.2
<p>Migratory Bird Treaty Act 16 USC §§703-711.</p>	Prohibits the non-permitted take of migratory birds.	USFWS and CDFG	Issues BO with Conditions after review of BA.	Applicant currently engaged in informal consultation with USFWS. Letter of concurrence will be obtained prior to construction.	8.2.1.2 8.2.2.2 8.2.2.3 8.2.2.4 8.2.3.3 8.2.5.2
State					
<p>California Endangered Species Act of 1984, Fish and Game Code, §2050 through §2098.</p>	Protects California's endangered and threatened species.	CDFG	Issues letter of concurrence after review of mitigation measures. Issues BO with Conditions after review of BA.	Applicant currently engaged in informal consultation with USFWS. Letter of concurrence will be obtained prior to construction.	Figure 8.2-1a & b 8.2.1.2 8.2.1.4 8.2.2.2 8.2.5.2
<p>Title 14, California Code of Regulations (CCR) §§670.2 and 670.5.</p>	Lists plants and animals of California declared to be threatened or endangered.	CDFG	Issues BO with Conditions after review of BA.	Applicant currently engaged in informal consultation with USFWS. Letter of concurrence will be obtained prior to construction.	8.2.1.4 Table 8.2-1

Table 8.2-7. (continued)

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance (Section)
Fish and Game Code Fully Protected Species. §3511: Fully Protected birds §4700: Fully Protected mammals §5050: Fully Protected reptiles and amphibians §5515: Fully Protected fishes	Prohibits the taking of listed plants and animals that are Fully Protected in California.	CDFG	Issues BO with Conditions after review of BA.	Applicant currently engaged in informal consultation with USFWS. Letter of concurrence will be obtained prior to construction.	Figure 8.2-1a & b 8.2.1.2 8.2.1.4 8.2.2.2 8.2.5.2
Fish and Game Code §1930, Significant Natural Areas.	Designates certain areas such as refuges, natural sloughs, riparian areas, and vernal pools as significant wildlife habitats. Listed in the CNDDDB.	CDFG	Issues BO with Conditions after review of BA.	Applicant currently engaged in informal consultation with USFWS. Letter of concurrence will be obtained prior to construction.	8.2.1 Figure 8.2-1a & b 8.2.1.1 8.2.1.2 8.2.1.4 Figure 8.2-4 8.2.2.2 8.2.2.3
Fish and Game Code §1580, Designated Ecological Reserves.	The CDFG commission designates land and water areas as significant wildlife habitats to be preserved in natural condition for the general public to observe and study.	CDFG	Issues BO with Conditions after review of BA.	Applicant currently engaged in informal consultation with USFWS. Letter of concurrence will be obtained prior to construction.	Figure 8.2-1a & b 8.2.2.3

Table 8.2-7. (continued)

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance (Section)
Fish and Game Code §1600, Streambed Alteration Agreement.	Reviews projects for impacts on waterways, including impacts to vegetation and wildlife from sediment, diversions, and other disturbances.	CDFG	Issues conditions of the Streambed Alteration Agreement that reduces and minimizes effects on vegetation and wildlife.	Streambed Alteration Agreement needed only if project impacts banks of waterways during construction.	8.2.2.3
Native Plant Protection Act of 1977, Fish and Game Code, §1900 et seq.	Designates state rare and endangered plants and provides specific protection measures for identified populations.	CDFG	Reviews mitigation options if there will be significant project effects on threatened or endangered plant species.	Mitigation measures being prepared for review by agencies. Letter of concurrence to be obtained before construction.	Figure 8.2-1a & b 8.2.1.4 8.2.2.3 8.2.3.2
CDFG Policies and Guidelines, Wetlands Resources Policy.	Provides for the protection, preservation, restoration, enhancement, and expansion of wetland habitats in California, including vernal pools.	CDFG California Environmental Protection Agency (Cal/EPA) CRWQCB	Reviews 404 permit application and wetland mitigation measures for compliance.	PCNs to be developed that include wetland mitigation measures. 404 permit to be obtained before start of construction.	8.2.2.2 8.2.5.2
Public Resource Code §§25500 & 25527.	Siting of facilities in certain areas of critical concern for biological resources, such as ecological preserves, wildlife refuges, estuaries, and unique or irreplaceable wildlife habitats of scientific or educational value, is prohibited, or when no alternative, strict criteria is applied.	USFWS CDFG	Issues BO with Conditions after review of BA.	Applicant currently engaged in informal consultation with USFWS. Letter of concurrence will be obtained prior to construction.	8.2.1.2 8.2.2.3 8.2.3.2

Table 8.2-7. (continued)

LORS	Purpose	Regulating Agency	Permit or Approval	Schedule and Status of Permit	Conformance (Section)
Title 20 CCR §§1702 (q) and (v).	Protects "areas of critical concern" and "species of special concern" identified by local, state, or federal resource agencies within the project area, including the CNPS.	USFWS CDFG	Issues BO with Conditions after review of BA.	Consultant to applicant currently engaged in informal consultation with USFWS. Letter of concurrence will be obtained prior to construction.	Figure 8.2-1a & b 8.2.1.2 8.2.1.4 Table 8.2-1 8.2.3.1 8.2.5
Title 14 CCR Section 15000 et seq.	Describes the types and extent of information required to evaluate the effects of a proposed project on biological resources of a project site.	USFWS CDFG	Issues BO with Conditions after review of BA.	Consultant to applicant currently engaged in informal consultation with USFWS. Letter of concurrence will be obtained prior to construction.	8.2.2.1 8.2.2.3 8.2.5

8.2.6 Involved Agencies and Agency Contacts

There are a number of agencies that are involved with biological resources and special status species. The agencies and persons to contact for each of these agencies are shown in Table 8.2-8.

Table 8.2-8. Agency contacts.

Agency	Contact	Title	Telephone
U.S. Fish and Wildlife Service Federal Building 2800 Cottage Way, Room W-2605 Sacramento, California 95825	Dan Buford	Branch Chief, Bay and Delta Branch	(916) 414-6600
California Department of Fish and Game 7329 Silverado Trail Napa, CA 94558 Mail: P.O. Box 47, Yountville, CA 94599	Carl Wilcox	Wildlife Biologist	(707) 944-5500
U.S. Army Corps of Engineers 333 Market Street San Francisco, CA 94105	Ed Wylie Mark D'Ávignon	South Section Chief Wetland Specialist	(415) 977-8464 (415) 977-8446
San Francisco Bay Regional Water Quality Control Board 1515 Clay Street, Suite 1400 Oakland, CA 94612	Keith Lichen Dale Bower	Contacts for surface water non-point sources, Alameda County	(510) 622-2300

8.2.7 Permits Required and Schedule

Applicable biological resources permits required for the project are listed below and in Table 8.2-9.

Table 8.2-9. Permits required and permit schedule.

Permit/Approval Required	Agency	Schedule
Clean Water Act, Section 404, Individual Project Permit to fill jurisdictional wetlands	U.S. Army Corps of Engineers, San Francisco District	Application concurrent with AFC filing, data adequacy, and approximately four-month review
Clean Water Act, Section 401, Water Quality Certification (for filling jurisdictional wetlands)	Regional Water Quality Control Board	Application concurrent with AFC filing, data adequacy, and approximately four-month review

Information requirements for these permits include:

- Complete characterization of the wetlands on wetland delineation forms (Appendix 8.2-D)
- Site maps showing the wetland delineation and location of the wetlands to be filled
- A description of the project that will fill the wetlands
- Construction methods that will be used and their potential effects on water quality in adjacent water bodies
- A complete mitigation plan, including an assessment of the quality of the wetlands fill and a plan to replace the filled wetlands at an acreage ratio of 1:1 or better with wetlands of equivalent or better quality, as near as possible to the location of the filled wetlands.

8.2.8 References

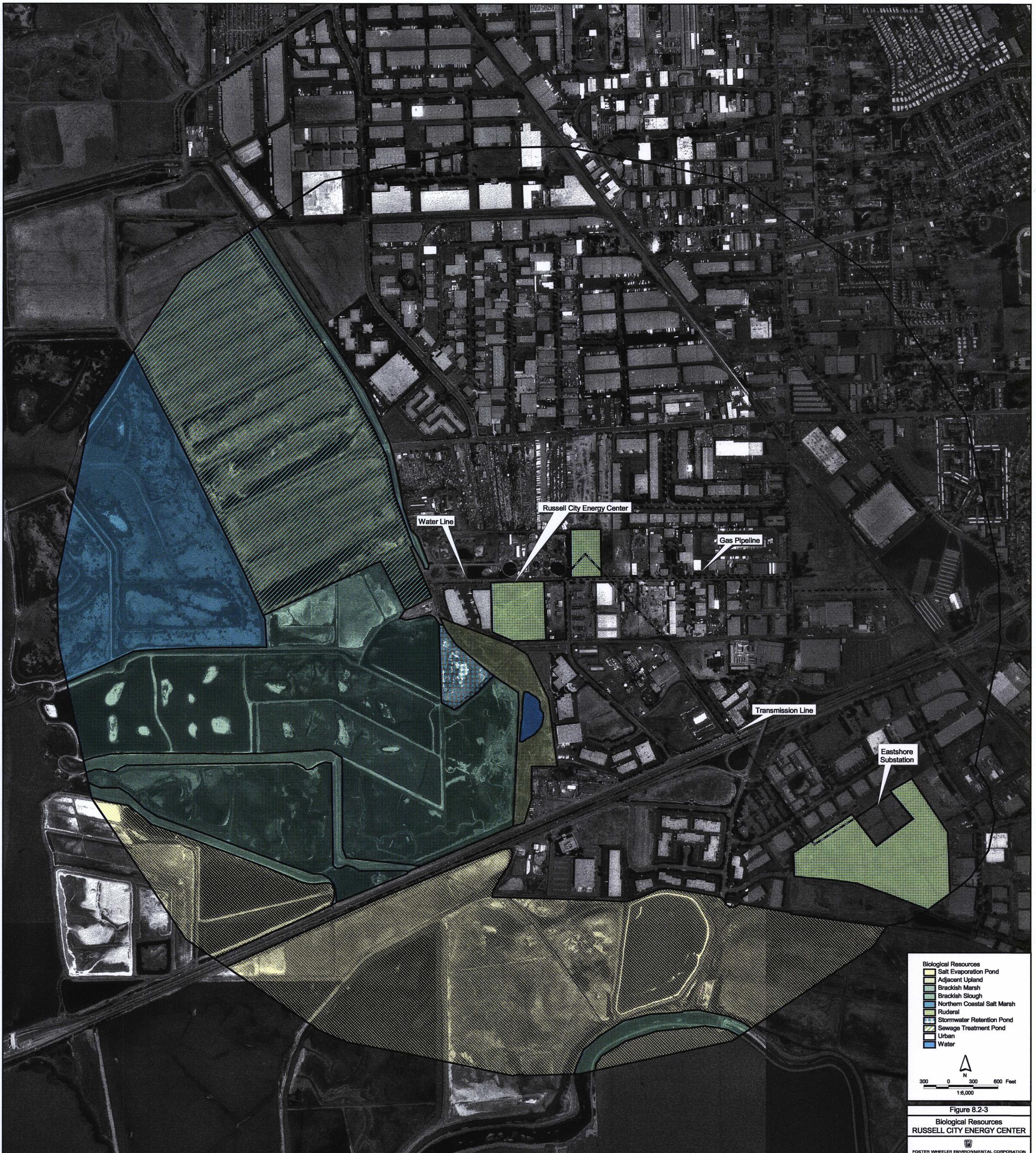
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Water Line

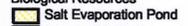
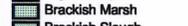
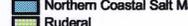
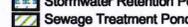
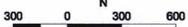
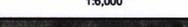
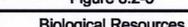
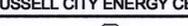
Russell City Energy Center

Gas Pipeline

Transmission Line

Eastshore Substation

Biological Resources

-  Salt Evaporation Pond
-  Adjacent Upland
-  Brackish Marsh
-  Brackish Slough
-  Northern Coastal Salt Marsh
-  Ruderal
-  Stormwater Retention Pond
-  Sewage Treatment Pond
-  Urban
-  Water

N

300 0 300 600 Feet

1:6,000

Figure 8.2-3
 Biological Resources
 RUSSELL CITY ENERGY CENTER
 FOSTER WHEELER ENVIRONMENTAL CORPORATION