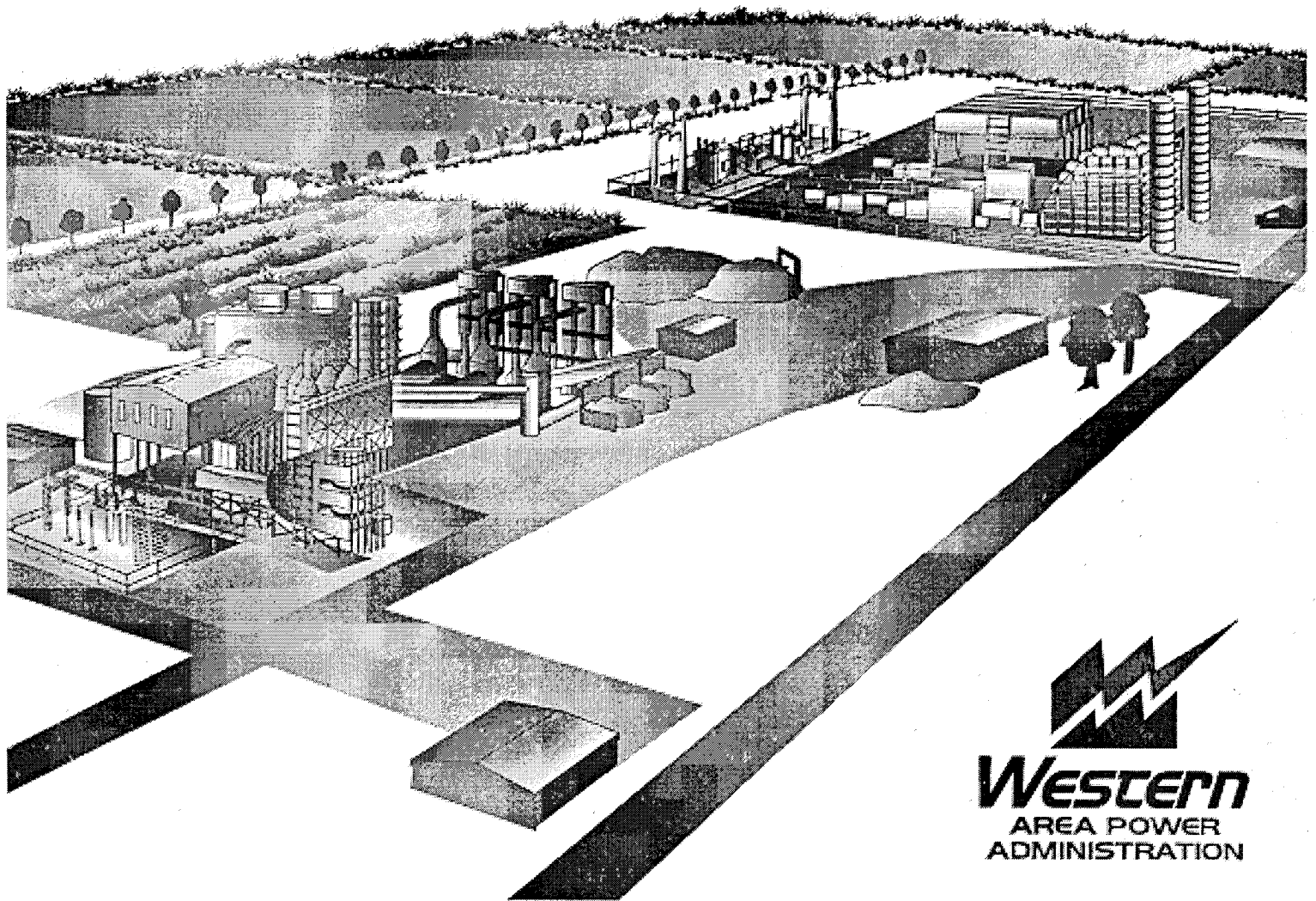


# Sutter Power Project

Final Environmental Impact Statement  
Volume 2 Appendices

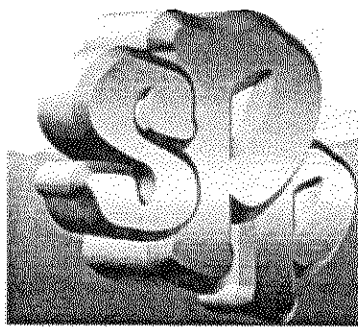
DOE/EIS 0294



**Sierra Nevada Customer Service Region**

Western Area Power Administration  
U.S. Department of Energy

APRIL 1999



# **Sutter Power Project**

**Final Environmental Impact Statement  
Volume 2 Appendices**

**DOE/EIS 0294**



## **Sierra Nevada Customer Service Region**

**Western Area Power Administration  
U.S. Department of Energy**

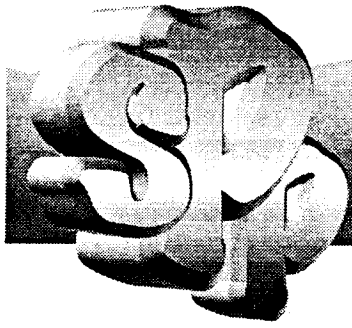
**APRIL 1999**

## SUMMARY OF APPENDICES

- A. Wetland Delineation Report for Sutter Power Plant Project, Sutter County, California by Foster Wheeler Environmental Corporation; dated June 1997.
- B. Department of the Army Clean Water Act Section 404 Individual Permit for Filling Wetlands on the Proposed Sutter Power Plant Project Site (ID# 199700183); dated Sept. 30, 1998.
- C. FSA/Draft EIS Distribution list and transmittal letters; dated October 1998.
- D. California Energy Commission Correction to the FSA/Draft EIS on Waste Management, Noise, Paleontological Resources, and Transmission System Engineering; dated Nov. 2, 1998.
- E. Sutter County Community Services Department correspondence to Sutter County Planning Commission regarding General Plan Amendment land use change and Rezoning; dated Nov. 12, 1998.
- F. Final Determination of Compliance for the Sutter Power Plant from FRAQMD; dated Nov. 13, 1998.<sup>1</sup>
- G. Revised Air Quality Testimony for the Sutter Power Plant; dated Nov. 17, 1998.
- H. Errata for Air Quality Testimony Filed on Nov. 17, 1998; dated Nov. 30, 1998.
- I. Supplemental Testimony for the Sutter Power Project (on Alternative Project Sites, Alternative Transmission Line Routes, Socioeconomics, and Plant Closure Fund); dated Nov. 24, 1998.
- J. Calpine Corporation's Biological Resources Mitigation Implementation Plan; dated December 1998.
- K. California Energy Commission Brief on Visual Resource Impacts in the matter of the Application for Certification of the Sutter Power Project; dated Dec. 9, 1998.
- L. Department of Interior letter to Western; dated Jan. 6, 1999.
- M. Calpine Corporation letter to California Energy Commission regarding Process Water Mitigation; dated Feb. 26, 1999.
- N. State of California, Office of Historic Preservation (SHPO) letter to Western; dated March 2, 1999.
- O. Complete Table of Conditions of Certification for the SPP (from Draft EIS, Presiding Members Proposed Decision and the Revised Presiding Members Proposed Decision).

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<sup>1</sup> The version included is the errata for the DOC, which contains the redline/strikeout format; dated Dec. 1, 1998.



# **Appendix A**

**Wetland Delineation Report  
for Sutter Power Plant  
Project, Sutter County, California  
by Foster Wheeler  
Environmental Corporation;  
Dated June 1997**

**Sierra Nevada Customer Service Region**

Draft  
-final



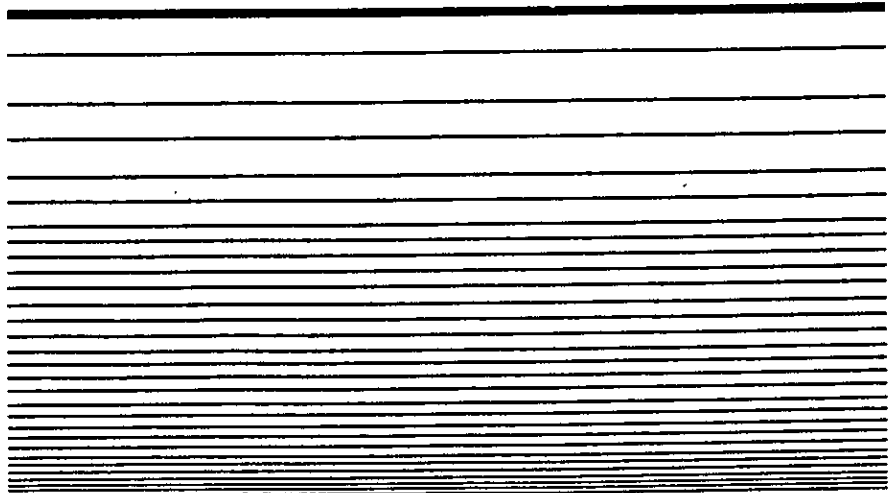
**FOSTER WHEELER  
ENVIRONMENTAL  
CORPORATION**



**WETLAND DELINEATION REPORT**  
**SUTTER POWER PLANT PROJECT**  
**SUTTER COUNTY, CALIFORNIA**

*PREPARED FOR:*  
**CALPINE CORPORATION**  
**SAN JOSE, CALIFORNIA**

JUNE 1997



**FOSTER WHEELER ENVIRONMENTAL CORPORATION**  
2525 NATOMAS PARK DRIVE • SUITE 250  
SACRAMENTO, CALIFORNIA • 95833-2900  
(916) 921-2525 • (916) 921-5124 FAX



REPLY TO  
ATTENTION OF

DEPARTMENT OF THE ARMY  
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO  
CORPS OF ENGINEERS  
1325 J STREET  
SACRAMENTO, CALIFORNIA 95814-2922  
June 30, 1997

Regulatory Branch (199700183)

Debra Crowe  
Foster Wheeler Environmental Corp.  
2525 Natomas Park Drive Suite 250  
Sacramento, California 95833-2900

Dear Ms. Crowe:

This letter concerns the Calpine Sutter Power Plant Project located Sutter County, California, within Section 24, Township 14 North and Range 2 East, MDB&M.

We have reviewed and verified the wetland map entitled, "Wetland Delineation Map, Sutter Power Plant Project Site", dated April 29, 1997, submitted to us with the letter dated June 16, 1997. The original map was field verified on June 23, 1997, with you and Ms. Charlene Wardlow of Calpine Corporation.

Our jurisdiction in this area is under Section 404 of the Clean Water Act. A Department of the Army permit is required prior to discharging dredged or fill materials into waters of the United States. Accordingly, a permit will be required prior to filling any of the waters present on the Calpine Sutter Power Plant property. The type of permit required will depend on the type and amount of waters which would be lost or adversely modified by fill activities.

This verification is valid for five years from the date of this letter unless new information warrants revision of the determination before the expiration date. Please refer to identification number 199700183 in any correspondence concerning this project. If you have any questions, please write to Ginger Fodge, Room 1480 at the letterhead address, or telephone (916) 557-5258.

Sincerely,

A handwritten signature in cursive script that reads "Bob Junell".

Bob Junell  
Chief, Sacramento Valley Office

Copy Furnished:

Charlene Wardlow, Environmental Manager, Calpine, P.O. Box 11279,  
Santa Rosa, California 95406-1279



**FOSTER WHEELER ENVIRONMENTAL CORPORATION**

June 16, 1997  
FWSO-CALPINE/SPP-BIO-011

Ms. Ginger Fodge  
U.S. Army Corps of Engineers  
Regulatory Branch  
1325 J Street, 14 Floor  
Sacramento, California 95814-2922

**RE: TRANSMITTAL OF DRAFT WETLAND DELINEATION REPORT FOR THE  
SUTTER POWER PLANT PROJECT, SUTTER COUNTY, CALIFORNIA**

Dear Ginger:

Enclosed is a copy of the Draft Wetland Delineation Report for the proposed Sutter Power Plant project in Sutter County, California. Pursuant to Section 404 of the Clean Water Act, Calpine Corporation requests a verification by your office of the wetland delineation described in the enclosed report.

The project area contains man-made excavations and newly forming seasonal depressions that show indicators of wetland parameters. The area was farmed in rice for more than 100 years. The footprint of the proposed project is envisioned to cover approximately 2.1 acres of borrow pits and a portion of a seasonal depression. A Pacific Gas and Electric natural gas pipeline is proposed to cross the Sutter National Wildlife Refuge within the Sutter Bypass. Within the Sutter Bypass, the pipeline will cross the two water channels and be placed under the pavement of Hughes Road in the Sutter County road right-of-way. Construction along Hughes Road will avoid all wetlands in the area. A Western Area Power Administration (WAPA) electric transmission line is proposed to connect the power plant to an existing WAPA line. The transmission line is proposed to follow farm roads and irrigation ditches and will not impact wetlands in the area.

Biological surveys for threatened and endangered species are currently underway to determine potential for project impacts and will be addressed in a biological assessment. Vernal pool crustacean surveys were conducted during the 1996-97 wet season and initial results indicate no threatened or endangered species occur in the ponding areas on the site. A follow-up dry season survey or second wet season survey will complete these results.

Please call me or Dave Augustine if you have any questions at (916) 921-2525.

Sincerely,

Debra J. Crowe  
Wetlands Biologist

Enclosure

cc. C. Wardlow (Calpine)  
D. Augustine (FWENC)

**DRAFT**

**WETLAND DELINEATION REPORT**

**SUTTER POWER PLANT PROJECT**  
**SUTTER COUNTY, CALIFORNIA**

Prepared for:

**CALPINE CORPORATION**  
50 West San Fernando Street  
San Jose, California 95113

Prepared by:

**FOSTER WHEELER ENVIRONMENTAL CORPORATION**  
2525 Natomas Park Drive, Suite 250  
Sacramento, California 95833

June 1997



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APPENDIX A: WETLAND DELINEATION MAP.

APPENDIX B: PHOTOGRAPHS OF POTENTIAL WETLANDS ON THE SUTTER POWER PLANT PROJECT SITE.

APPENDIX C: WETLAND DELINEATION DATA SHEETS.

APPENDIX D: PLANT SPECIES LIST FOR SUTTER POWER PLANT PROJECT FROM BOTANIST JEFF GLAZNER.

## 1.0 INTRODUCTION

### 1.1 DESCRIPTION OF PROPOSED PROJECT

Calpine Corporation (Calpine) is planning to construct and operate a 480-MW gas-fired merchant power plant in central Sutter County, California (Figure 1). Sutter Power Plant, the proposed project, will be built adjacent to Calpine's existing active 49.5-MW Greenleaf 1 cogeneration facility. The current cogeneration facility occupies 12 acres on a 77-acre parcel. Calpine is expected to begin construction of the Sutter Power Plant in 1998 and will require approximately 12 acres of land.

Approximately 14 miles of gas pipeline and electric transmission line corridors are proposed to connect the Sutter Power Plant facility to existing utility lines. Under the California Energy Commission's Application for Certification (AFC) regulations, a 1000-foot corridor along these routes is currently being surveyed for biological resources, including wildlife, vegetation, and potential sensitive species' habitats. The project will require a new 20-inch Pacific Gas and Electric (PG&E) natural gas pipeline, which will run north and then west, crossing the Sutter National Wildlife Refuge (Sutter Wildlife Refuge) and ending on the north side of the Sacramento River (Figure 2). The PG&E gas pipeline will cross "waters of the U.S." in the Sutter Bypass but will not cross the Sacramento River. An existing 8-inch pipeline used to provide natural gas to Greenleaf 1 follows most of the proposed route. A 230-kV transmission line and switchyard are proposed to connect the new power plant to an existing Western Area Power Administration (WAPA) 230-kV transmission line southwest of the site, ending at the east levee of the Sutter Bypass. The transmission line will parallel farm roads and/or irrigation ditches.

### 1.2 PROJECT SITE LOCATION AND OVERVIEW

Calpine's proposed Sutter Power Plant project site is located in Sutter County, California, approximately 7 miles southwest of Yuba City (Figure 1). The project site is bordered by Township Road on the east, and rice fields on the north, west, and south sides. Orchards dominate the land areas east of Township Road and rice fields are dominant west of Township Road to the Sutter Bypass. Access to the project site is from Township Road. Sutter Wildlife Refuge, located inside and east of the Sutter Bypass levee, is 2 miles directly west of the site. The Sutter Power Plant project site and proposed transmission line and pipeline corridor routes are shown in Figure 2. The physical location is described as follows:

Plant site:	Sutter County Gilsizer Slough Quadrangle Township 14N, Range 2E, ¼ NE, ¼ NE
Pipeline route:	Extends west onto Tisdale Weir and Grimes Quadrangles
Transmission line route:	Extends southwest on Gilsizer Slough and an alternative route extends south onto Sutter Causeway Quadrangle

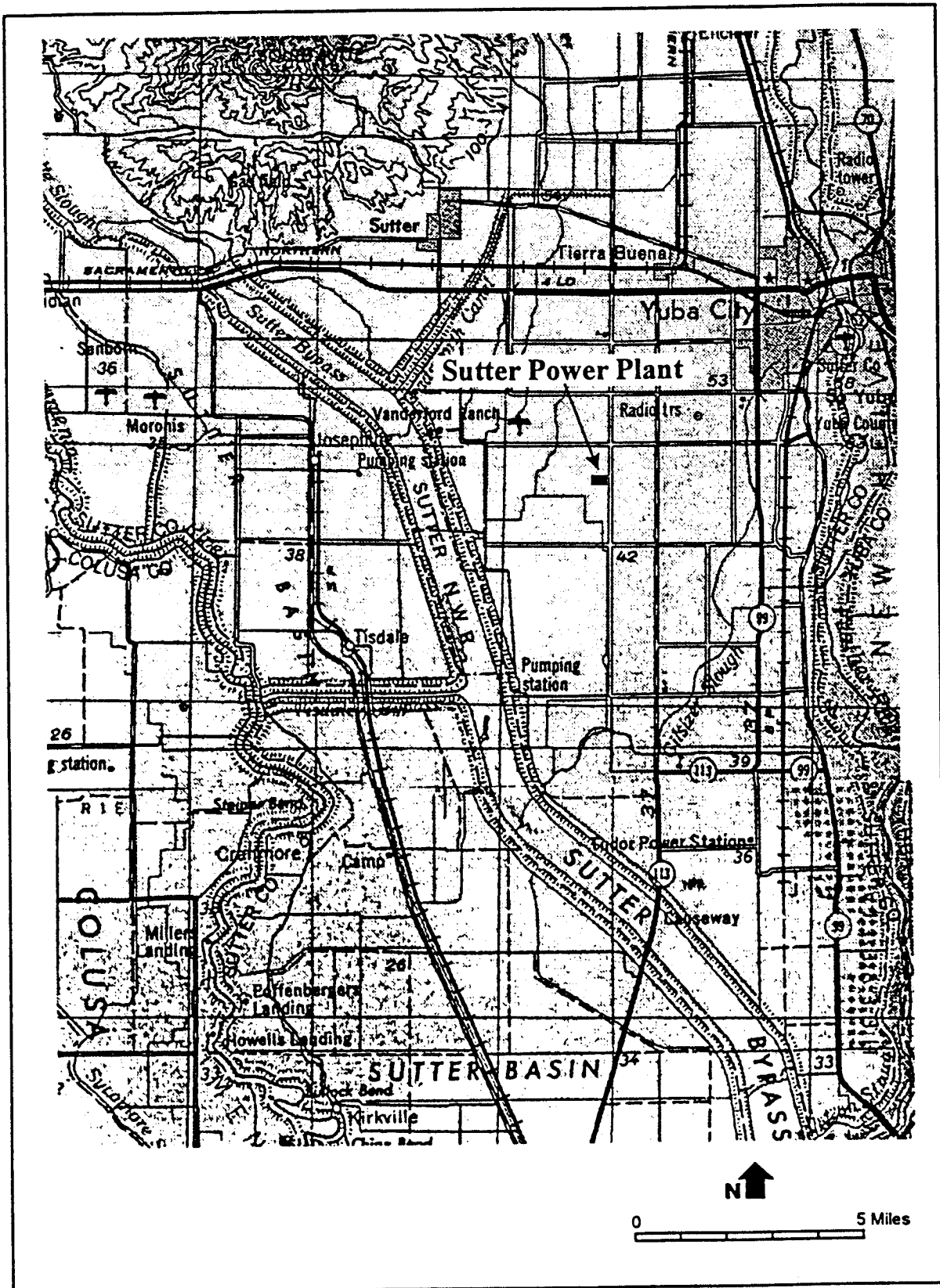


Figure 1. Location map for Calpine Corporation's Sutter Power Plant Project, Yuba City, California.

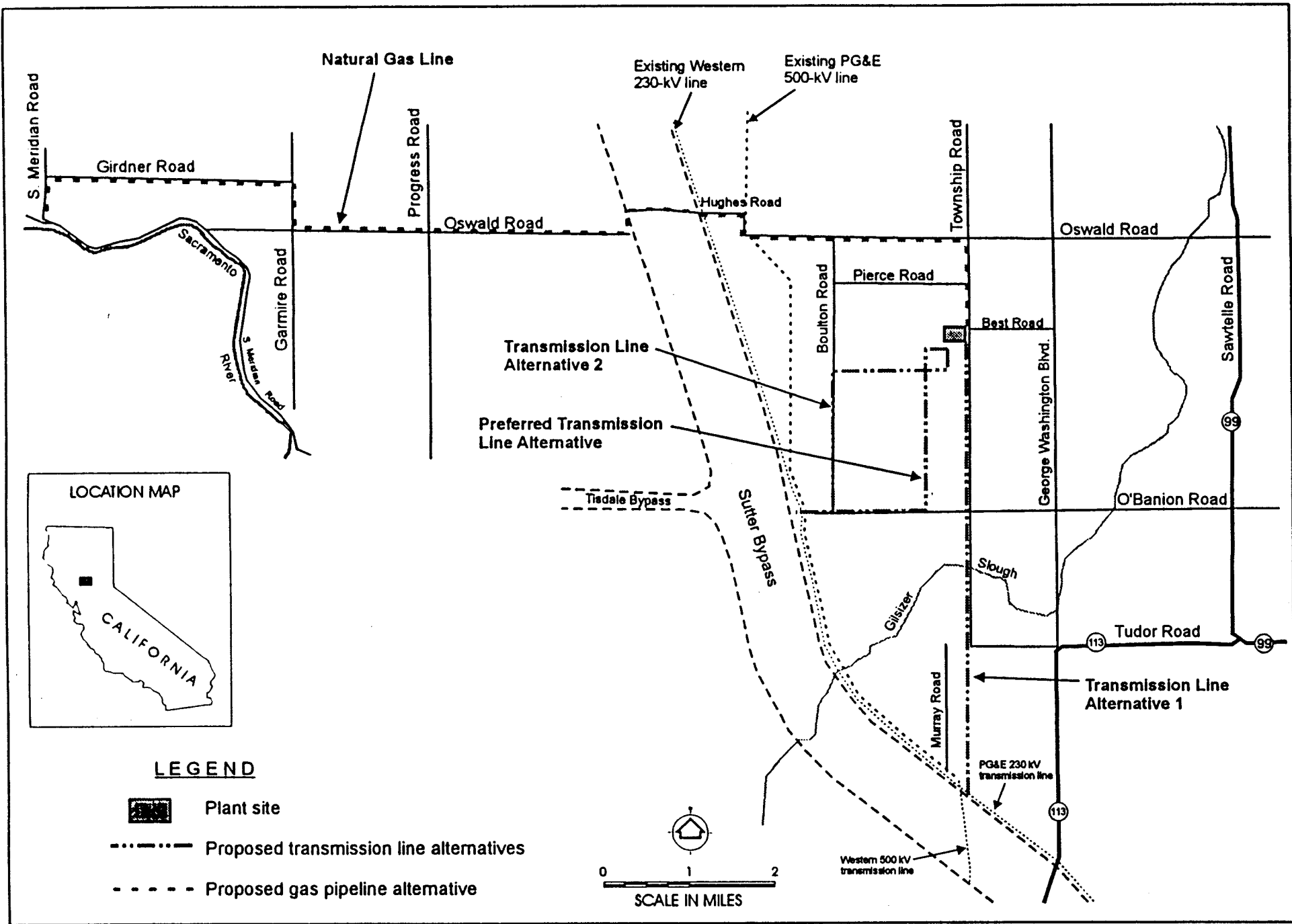


Figure 2. Sutter Power Plant project features.

The 77-acre Calpine site was farmed in rice from the late 1800s until 1986 when the Greenleaf 1 facility was developed. It is zoned agricultural but has not been in active farming since 1986. The surrounding properties are currently farmed in orchards, row crops, and rice (Figure 3). The site will be rezoned to industrial as part of the Sutter Power Plant project.

### **1.3 ENVIRONMENTAL SETTING**

The 77-acre site is former rice fields and a single-family residence. It currently contains disturbed grassland surrounding the existing Greenleaf 1 facility. The site is disked and mowed 2 to 3 times per year during the dry season for fire control. The mowed annual grassland contains non-native and native plant species used by several raptor species for forage habitat. The soil has variable layering with areas of slow-draining clay and well-drained sand lenses (Bechtel 1986). The underlain clay areas provide suitable conditions for development of depressions that pond water during the wet seasons (Figure 3 and Appendix A).

Borrow pits and temporary mosquito abatement trenches were excavated during construction of the Greenleaf 1 facility in 1987. These excavations left features that collect and hold rain water during the wet season. The borrow pits, mosquito abatement trenches, and seasonal depressions developing in the annual grasslands on the project site are exhibiting colonization of wetland indicator plant species.

Agricultural drainage ditches border all four sides of the property. These man-made ditches contain vegetation such as cattails, bull rush, and small willow trees. Frogs, small fish, American bittern, mallards, coots, muskrat, and raccoon are known to inhabit or forage in the ditches. A ditch that drains water from the active cooling pond and divides the south central portion of the property contains young riparian vegetation in areas (Appendix B-11). A detailed description of the ditches and ponding features, and their original purpose, function, and current uses are presented in the Results section.

The utility corridors travel along man-made irrigation ditches and county road easements. The existing 8-inch PG&E natural gas pipeline is within the 100-foot wide county road easement along the north side of Hughes Road. The proposed additional 20-inch gas pipeline will be placed under the pavement of Hughes Road that travels through the Sutter Wildlife Refuge. The Sutter Wildlife Refuge contains emergent marsh and riparian habitat that extend into the county road easement.

### **1.4 SCOPE AND EXTENT OF WETLAND INVESTIGATION**

Potential project impacts to wetlands are to be analyzed as part of the AFC process. If a project area appears to contain potential wetlands, natural or man-made, the applicant determines whether the area exhibits wetland characteristics through a wetland delineation. Wetlands are defined by the United States Army Corps of Engineers (USACE) as "those areas inundated or saturated by surface or ground water at a



Figure 3. Calpine Corporation's Sutter Power Plant Project Site showing Greenleaf 1 facilities, surrounding land use, agricultural ditches, and man-made wetlands in disturbed annual grassland, April 14, 1997.

frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas.” The USACE 1987 Wetland Delineation Manual (1987 Manual) defines wetlands as having positive indicators of wetland hydrology, hydric soils, and hydrophytic vegetation (Environmental Laboratory 1987). The USACE bases its jurisdictional areas on wetland delineations that use the 1987 Manual and wetland criteria.

Calpine Corporation contracted wetlands biologist, Debra Crowe of Foster Wheeler Environmental Corporation, to perform a wetland delineation at the proposed Sutter Power Plant site. This delineation determined the extent of potential wetland impacts from construction and operation of the proposed power plant and determined the extent of necessary agency involvement. The wetland delineation activities were conducted in the proposed construction area during April 1997.

Results of this wetland delineation procedure are presented in Section 3.0. The wetland delineation map and photographs are provided in Appendices A and B, respectively. The wetland delineation data forms are included as Appendix C.

#### **1.4.1 Applicable Laws**

In Title 33 of the Code of Federal Regulations (CFR), “waters of the United States” are defined as waters having current or historic use for interstate or foreign commerce, including wetlands. The USACE has jurisdiction over areas identified as “waters of the United States” under Section 404 of the Clean Water Act (CWA). The CWA Section 404 program is implemented by the USACE and United States Environmental Protection Agency (USEPA). Under the CWA 404 program, the USACE issues permits to fill wetlands on a project site and the USEPA has authority to determine extent of federal jurisdiction.

The USACE can issue nationwide permits (NWP) to allow activities, such as fill of isolated wetlands (NWP 26), on project sites. The NWP 26 is issued for projects that intend to fill 3.0 acres or less of wetlands under the discretion of the USACE. If greater than 3.0 acres of isolated wetlands are proposed to be filled, an individual 404 permit is necessary. A NWP 12 is issued for the utility line discharges as long as there are no changes in preconstruction contours. In California, a Section 401 water quality certification from the California Regional Water Quality Control Board (CRWQCB) is also necessary to fill wetlands in conjunction with a 404 permit. A Streambed Alteration Agreement with California Department of Fish and Game is necessary if construction will affect the bank of a water channel.

### **1.5 THREATENED AND ENDANGERED SPECIES’ HABITATS**

A review of the United States Fish and Wildlife Service (USFWS) list of threatened or endangered species, CDFG California Natural Diversity Data Base (CNDDB), California



Native Plant Society (CNPS) electronic inventory, and the Sutter Wildlife Refuge species lists was conducted to determine if potential impacts to wetlands during construction could cause impacts to sensitive species. The above mentioned literature identifies known locations of special status plant species and areas where special status animal species are known to occur or could potentially occur. If special status species could potentially be affected during construction and operation activities, precautionary measures will be implemented by Calpine to ensure threatened or endangered species are not jeopardized.

## 2.0 MATERIALS AND METHODS

### 2.1 WETLAND DELINEATION METHODOLOGY AND BOUNDARY IDENTIFICATION

The presence and extent of wetlands on the Sutter Power Plant site and utility corridors are based on the technical criteria and procedures described in the USACE 1987 Wetland Delineation Manual and on existing USFWS wetland inventory maps. To qualify as a wetland according to the 1987 Manual, most areas must exhibit indicators of hydrophytic vegetation, wetland hydrology, and hydric soils (Environmental Laboratory 1987). In all cases, wetland determinations must be supported by common sense and best professional judgment.

Preliminary review of the site and utility corridors for ponding or saturation areas was conducted during the 1996-97 wet season as part of vernal pool crustacean surveys. Review of the 1988 Sutter County soil survey, the Sutter County hydric soils list, 1996 and 1952 Sutter County aerial photos, 1997 project flight photos, 1973 United States Geological Survey (USGS) topographic maps, and 1989 USFWS wetland inventory maps was also conducted. These resources were used to identify new normal circumstances, including past and present site disturbance, existing wetlands, soil types, and topographic features, i.e. drainage patterns.

Wetland boundaries are determined by identifying the location of a transition zone between the area that contains wetland indicators and areas without wetland indicators, usually evident at a change in vegetation type and/or structural feature. Wetland boundaries for the Sutter Power Plant site are shown on the wetland delineation map in Appendix A. Acreage of wetlands was determined by planimetry of the boundaries on a 1996 ortho-corrected 1":200' aerial photo and field measurements. Photographs of the wetland/nonwetland boundaries are presented in Appendix B. Routine on-site data forms with survey results for vegetation, hydrology, and soil type are presented in Appendix C.

### 2.2 FIELD INVESTIGATION OF WETLAND PARAMETERS

Wetlands on the Sutter Power Plant project site were identified based on the presence of wetland vegetation, hydrology, and soils. Thirteen sample plots were evaluated during the delineation activities; at least one representative soil evaluation was conducted in each of the potential wetland types (Appendices A and C). Wetlands within the Hughes Road easement were identified by reviewing existing wetland inventory maps and delineating areas that contain wetland vegetation species within the right-of-way.

Wetlands Biologist, Debra Crowe, conducted wet season field surveys for indicators of wetland hydrology (and listed vernal pool crustaceans) every other week from January 15 through April 7, 1997. Botanist and wetlands specialist, Jeff Glazner, conducted botanical

surveys on April 3, 8, 15, and 22, 1997. Ms. Crowe and/or Mr. Glazner conducted wetland delineation field sampling on April 3, 22, and 29, 1997.

### 2.2.1 Wetland Vegetation Parameter

Wetland vegetation refers to a predominance of species adapted to areas inundated, ponded, or saturated long enough to produce anaerobic soil conditions. These plant species are classified as obligate wetland (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), or upland (UPL) species (Reed 1988) (Table 1).

TABLE 1. PLANT INDICATOR STATUS CATEGORIES.\*

Obligate Wetland Plants (OBL)	Plants that occur almost always (estimated probability >99%) in wetlands, but also occur (estimated probability 1% to 33%) in nonwetlands. Examples: <i>Typha</i> sp., <i>Callitriche marginata</i>
Facultative Wetland Plants (FACW)	Plants that occur usually (estimated probability >67% to 99%) in wetlands, but also occur (estimated probability 1% to 33%) in nonwetlands. Examples: <i>Alopecurus carolinianus</i> , <i>Rumex crispus</i>
Facultative Plants (FAC)	Plants with a similar likelihood (estimated probability 33% to 67%) of occurring in both wetlands and nonwetlands. Example: <i>Lepidium densiflorum</i>
Facultative Upland Plants (FACU)	Plants that occur sometimes (estimated probability 1% to <33%) in wetlands, but occur more often (estimated probability >67% to 99%) in nonwetlands. Example: <i>Sorghum halepense</i>
Obligate Upland Plants (UPL)	Plants that occur rarely (estimated probability <1%) in wetlands, but occur almost always (estimated probability >99%) in nonwetlands under natural conditions. Examples: <i>Brassica nigra</i> , <i>Avena fatua</i> , <i>Medicago polymorpha</i>

\* Categories were originally developed and defined by the USFWS National Wetlands Inventory and subsequently modified by the National Plant List Panel. The three facultative categories are subdivided by (+) and (-) modifiers. Source: 1987 Manual.

Dominant plant species were identified at each sample plot during the spring 1997 blooming season. The sample plots met the wetland vegetation criterion if 50 percent or more of the dominant (20 percent cover or more) plant species were FAC, FACW, or OBL. Wetland indicator status for each species was verified from the National List of Plant Species that Occur in Wetlands (Reed 1988). Wetland indicator species were also verified by Jeff Glazner, botanist and wetland specialist. Nomenclature is derived from The Jepson Manual (Hickman, ed. 1993).

### 2.2.2 Wetland Hydrology Parameter

Wetland hydrology was determined by visual observation of ponding and soil saturation

during the 1996-97 wet season surveys for listed vernal pool crustacean species (Foster Wheeler Environmental 1997). The areas with ponding or saturation were mapped, measured, and surveyed for wetland vegetation and hydric soils during the spring growing season. Hydrology was also determined by the drainage patterns in the area and local soil survey data. The area met the wetland hydrology criterion if water ponded or saturated the surface soil for more than 42 days (12.5 percent of 335-day growing season) during the growing season (Environmental Laboratory 1987). The approximate growing season in Northern California is from January 23 until December 14 (Wetland Training Institute, Inc. 1993) or January 15 until December 2 (USDA 1988). However, these dates are normally the growing season determined suitable for agricultural crops. The growing season for native plants, especially seasonal wetland plants do extend into the winter "non-growing" period mentioned above.

Annual long-term average precipitation for the Yuba City area is 21.04 inches (National Weather Service, May 8, 1997). The official 1996-97 precipitation measurement is not available until July 1997. Groundwater depth on the project site is from 2.5 to 3.5 feet below ground surface (Bechtel 1986). Site visits to determine ponding or saturation were conducted from January 15 through April 7, 1997. Hydrology indicators for the site were recorded on data forms (Appendix C). Collected data included depth to free standing water, recorded depth of inundation, duration of inundation, and evidence of saturation. Photographs were taken of inundation, saturation, and vegetation at sample plots (Appendix B).

### **2.2.3 Hydric Soil Parameter**

The Sutter County soil survey indicates the soils on the project site were formed in alluvium and are moderate to well-drained. Soils in the north and west portions of the project site contain Gridley clay loam with 20 percent inclusions of Oswald, Capay, Conejo, Liveoak, Marcum, and Tisdale soil series. The south and east portion of the project site contains Tisdale clay loam with 25 percent inclusions of Oswald, Conejo, Gridley, and Liveoak soil series. Of these soil types Capay and Oswald series are considered hydric (USDA 1992).

Soil at the Sutter Power Plant site met the hydric soils criterion if the matrix had a low chroma with mottles, if concretions were present, and/or if it was on the hydric soils list. Hydric soils criterion can also be met when it is verified that inundation, saturation, or flooding occurs long enough during the growing season to develop anaerobic conditions in the upper part (Environmental Laboratory 1987) that support hydrophytic vegetation. Soil profiles were analyzed in the thirteen sample plots representing each of the potential wetland types on the project site.

Soil pits were dug to a depth of 10 to 16 inches to determine soil and hydrologic properties in each of the sample plots. Soil from the pits were compared with the mapped soil descriptions from the Sutter County soil survey (USDA 1988) and with the list of hydric soils for Sutter County (USDA 1992). A Munsell color chart was used to

determine colors of moist soil samples. Soils in the upper 10 inches of the surface with a matrix chroma of 2 or less in mottled soils or soils with a matrix chroma of 1 in unmottled soils are considered hydric (Environmental Laboratory 1987). Each of the soil pit locations are mapped on site drawings (Appendix A) and observations of soil profiles are recorded on data forms (Appendix C).

### **2.3 THREATENED AND ENDANGERED SPECIES**

After review of the USFWS, CDFG, and CNPS lists of threatened or endangered species that could occur in the Sutter Power Plant project area, field surveys were conducted to identify locations of listed species, their habitats, and any potential habitats during wildlife and botanical surveys from January through June 1997. The results of listed species within the wetland habitats are presented in the Results section.

## 3.0 RESULTS

### 3.1 WETLAND BOUNDARIES IN THE SUTTER POWER PLANT PROJECT AREA

Wetland boundaries were identified by the presence of hydrophytic vegetation, wetland hydrology, and hydric soils (Appendix C). Most of the ponded areas identified during the 1996-97 wet season vernal pool crustacean surveys also contained wetland indicator plant species. The ponded areas with wetland indicators on the plant site are isolated wetlands, not connected to other waters of the U.S., and dry up during summer months. Wetland types on the Sutter Power Plant project site include man-made borrow pits and abandoned mosquito abatement trenches that have developed wetland indicators over the past 10 years. Seasonal ponded depressions and transitional vernal pools appear to be developing in the former rice fields that now contain disturbed annual grassland. The three wetland parameters are described for each wetland type in this section. Table 2 shows a summary of the positive wetland indicators and acreage for each wetland within the Sutter Power Plant project site. A complete plant species list for the Sutter Power Plant project is included as Appendix D.

The 100-foot county road easement within the Sutter Wildlife Refuge contains emergent marsh that is managed by the USFWS. Irrigation ditches convey the water to maintain the marsh. The PG&E gas pipeline construction vehicles will be able to avoid the areas of marsh during construction of the pipeline underneath Hughes Road.

The upland areas on the project site are distinguished by tall annual grass and forb species including, wild radish (*Raphanus sativus*), wild oats (*Avena fatua*), Italian ryegrass (*Lolium multiflorum*), and star thistle (*Centaurea solstitialis*). They do not pond water during the wet season. The soils in these upland areas show indicators of hydric soils in that they have low chroma and occasional concretions. The soils may be showing these hydric indicators from being farmed in rice for over 100 years where inundation occurs approximately half of the year.

#### 3.1.1 Transitional Vernal Pools

Even though the grasslands are disked three times during the dry season, environmental conditions in the southeast portion of the project site are suited to the development of seasonal wetlands or transitional vernal pools (Appendices A and B). These ponding features are lacking the variety of plant species found in pristine vernal pools, most likely due to the numerous years of being farmed in rice, annual disking activities and the relatively short fallow period.

Typical plant species observed in these degraded wetlands include; popcorn flower (*Plagiobothrys stipitatus* var. *micranthus*) (Appendix B-1 and C), tufted foxtail

(*Alopecurus carolinianus*) (Appendix B-2), hooded canary-grass (*Phalaris paradoxa*), annual bluegrass (*Poa annua*), and Idaho bittercress (*Cardamine oligosperma*).

The nine transitional vernal pools encompass 0.42 acres (0.004 to 0.17 acres each) and pond rain water during the wet season for at least 42 days (Table 2, Appendix C).

Soils in the transitional vernal pools show indicators of hydric soil. Samples show low chroma and a layer of thick clay approximately 6 inches below ground surface (Table 2, Appendix C).

### 3.1.2 Borrow Pits

Directly west and north of the existing Greenleaf 1 facility are four borrow pits that were dug in 1987 as a fill material source for construction of the facility's foundation (Appendix A). The borrow pits have not been used or maintained since construction of the Greenleaf 1 facility and currently show indicators of all three wetland parameters. The borrow pits encompass 1.12 acres (0.03 to 0.52 acres each).

Typical plant species in the man-made borrow pits include willow (*Salix gooddingii* and *S. exigua*), cottonwood (*Populus fremontii*), swamp grass (*Crypsis schoenoides*), smooth boisduvalia (*Epilobium pygmaeum*), foxtail barley (*Hordeum marinum* ssp. *gussoneanum*), aquatic pigmy-weed (*Crassula aquatica*), and winged-water starwort (*Callitriche marginata*). The few willow and cottonwood trees are approximately 10 feet tall.

The borrow pits collect water during the wet season from a depth of 50 to 75 centimeters for a duration of approximately 70 to 120 days (1996-97 wet season) (Appendix B-3). The borrow pits contain aquatic invertebrates and a non-listed species of fairy shrimp, the California linderiella (*Linderiella occidentalis*) (Appendix B-4) (Foster Wheeler Environmental 1997).

One soil pit was dug to represent the borrow pits. The soils show indicators of hydric soil; low chroma and concretions (Table 2 and Appendix C).

### 3.1.3 Mosquito Abatement Trenches

Eleven mosquito abatement trenches and a cooling pond were excavated south of the existing Greenleaf 1 facility in 1987 during construction of the facility (Appendix A). The eleven mosquito abatement trenches were leased to the Sutter County Mosquito Abatement District to raise mosquito fish (*Gambusia* sp.) stock from 1987 until 1991 (Appendices A and B-5). One former mosquito abatement trench receives hydrology year-round from a ground water source and is considered a waters of the U.S. These abandoned man-made trenches currently exhibit indicators of all three wetland parameters. The mosquito abatement trenches encompass 2.03 acres (0.11 to 0.27 acres each).

Greenleaf 1 currently uses the cooling pond to receive water from cooling towers and conducts regular maintenance on it. This 3-foot deep cooling pond contains small fish, bullfrog tadpoles, crayfish, and other aquatic invertebrates.

Typical plant species inhabiting the man-made mosquito abatement trenches include willow (*Salix exigua* and *S. gooddingii*), cottonwood (*Populus fremontii*), cattails (*Typha latifolia*), and dallis grass (*Paspalum dilatatum*).

The abandoned mosquito abatement trenches ponded water between 42 and 80 days during the 1996-97 wet season. Two of the abandoned mosquito abatement trenches (SPP-4 and-12) contain very small populations of California linderiella.

One soil pit was analyzed to represent the mosquito abatement trenches. Soils show indicators of hydric soil; low chroma and concretions (Table 2 and Appendix C).

### 3.1.4 Seasonal Ponded Depressions

Seasonal ponded depressions develop in low areas of the disturbed annual grassland area west of Greenleaf 1 and along the base of agricultural ditch berms (Appendix A). During the wet season, as the rains saturate the soil, topographical depressions in the soil pond water to form these seasonally ponded areas. Five of these depressions show indicators of all three wetland parameters. However, these ponded depressions are highly degraded from being farmed for over 100 years and disked annually. They have relatively non-distinct boundaries compared to the transitional vernal pools (Appendix B-6). The seasonal ponded depressions encompass 5.10 acres (0.01 to 4.19 acres each).

The degraded seasonal ponded depressions hold water between 42 and 56 days (Appendix B-7) and contain weedy wetland species including curly dock (*Rumex crispus*), Johnsongrass (*Sorghum halepense*), and tufted foxtail (*Alopecurus carolinianus*) (Appendix B-8).

Seasonal ponded depression soils show indicators of hydric soil; low chroma and few concretions (Table 2 and Appendix C).

### 3.1.5 Drainage Ditches

The man-made agricultural irrigation ditches that border the site are currently used and maintained by the rice farmers in the vicinity (Appendix B-9) and are not considered wetlands. They normally contain water intermittently during the rainy wet season and during crop irrigation times (Appendix B-10). The drainage ditch in the south-central portion of the project site receives water from the active cooling pond and the effluent is conveyed to the Sutter Bypass through a series of agricultural ditches (Appendix B-11). A valid National Pollutant Discharge Elimination System (NPDES) permit held by Calpine satisfies regulatory requirements for the discharge.



TABLE 2. SUMMARY OF 1997 WETLAND DELINEATION DATA FOR THE CALPINE SUTTER POWER PLANT PROJECT SITE.

Waterbody	Wetland acres	Max Depth (cm)	Wetland Delineation Plot Number(s)	Wetland Indicators Present		
				Vegetation (% dominance)	Hydrology (saturated days)	Soil* (field verified)
<u>Transitional vernal pools</u>						
SPP-15	0.17	20	9	60	>84	Hydric <sup>a</sup>
SPP-16	0.03	15	6	100	>42	Hydric <sup>a</sup>
SPP-18	0.01	13	13	50-100	>42	--
SPP-17	0.08	15	--	50-100	>42	--
SPP-19	0.04	19	--	50-100	>42	--
SPP-21	0.004	13	--	50-100	>42	--
SPP-22	0.06	13	--	50-100	>42	--
SPP-23	0.01	13	--	50-100	>42	--
SPP-25	0.02	11	--	50-100	>42	--
<b>Total acres</b>	<b>0.424</b>					
<u>Borrow pits</u>						
SPP-31 <sup>c</sup>	0.52	50	10	100	>70	Hydric <sup>a, b</sup>
SPP-29	0.03	25	--	50-100	>70	--
SPP-32 <sup>c</sup>	0.30	75	--	50-100	>120	--
SPP-36 <sup>c</sup>	0.27	55	--	50-100	>84	--
<b>Total acres</b>	<b>1.12</b>					
<u>Mosquito abatement trenches</u>						
SPP-4 <sup>c</sup>	0.11	55	13	100	>80	Hydric <sup>a, b</sup>
SPP-5	0.13	45	--	50-100	>42	--
SPP-6	0.13	60	--	50-100	>56	--
SPP-7	0.15	22	--	50-100	>42	--
SPP-8	0.13	13	--	50-100	>80	--
SPP-9	0.13	50	--	50-100	>70	--
SPP-10	0.26	40	--	50-100	>42	--
SPP-11	0.26	40	--	50-100	>42	--
SPP-12 <sup>c</sup>	0.27	46	--	50-100	>56	--
SPP-13	0.19	23	--	50-100	>42	--
<b>Total acres</b>	<b>1.76</b>					

TABLE 2. (CONTINUED) SUMMARY OF 1997 WETLAND DELINEATION DATA FOR THE CALPINE SUTTER POWER PLANT PROJECT SITE.

Waterbody	Wetland acres	Max Depth (cm)	Wetland Delineation Plot Number(s)	Wetland Indicators Present		
				Vegetation (% dominance)	Hydrology (saturated days)	Soil* (field verified)
<u>Perennial mosquito abatement pond</u>						
SPP-14 <sup>d</sup>	0.27	>120	--	--	year-round	--
<b>Total acres</b>	<b>0.27</b>					
<u>Seasonal depressions</u>						
SPP-1	0.26	19	12	50	>42	Hydric <sup>a</sup>
SPP-24	0.13	14	8	60	>42	Hydric <sup>a</sup>
SPP-27	0.01	24	--	50-100	>42	--
SPP-33 <sup>c</sup>	4.19	21	1, 2, 3	100, 80, 75	>56	Hydric <sup>a, b</sup>
SPP-34 <sup>c</sup>	0.24	10	--	50-100	>42	--
SPP-35	0.27	12	--	50-100	>42	--
<b>Total acres</b>	<b>5.10</b>					
<b>Total man-made wetland acres</b>			<b>3.16</b>			
<b>Total developing wetland acres</b>			<b>5.51</b>			
<b>Grand total acres</b>			<b>8.67</b>			

30 wetlands

- \* Only soil from the representative locations were analyzed
- <sup>a</sup> Low chroma
- <sup>b</sup> Concretions
- <sup>c</sup> Location of *Lindieriella occidentalis*
- <sup>d</sup> Year-round pond at water table.

### 3.1.6 Sutter Wildlife Refuge Wetland Boundaries

Since Sutter Wildlife Refuge wetlands were already mapped in the Sutter Bypass, this wetland delineation determined the boundary of the wetland vegetation parameter within the Hughes Road right-of-way and construction area needed for this project (Appendix B-12). Emergent marsh plant species were used to determine the outer boundary of the wetlands. Figure 4 shows the outer boundary of the wetlands within the right-of-way and the area available for construction vehicles to maneuver.

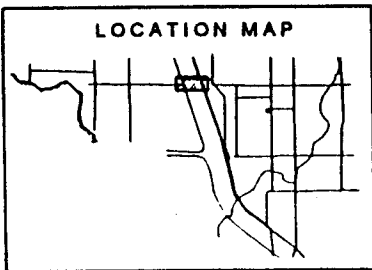
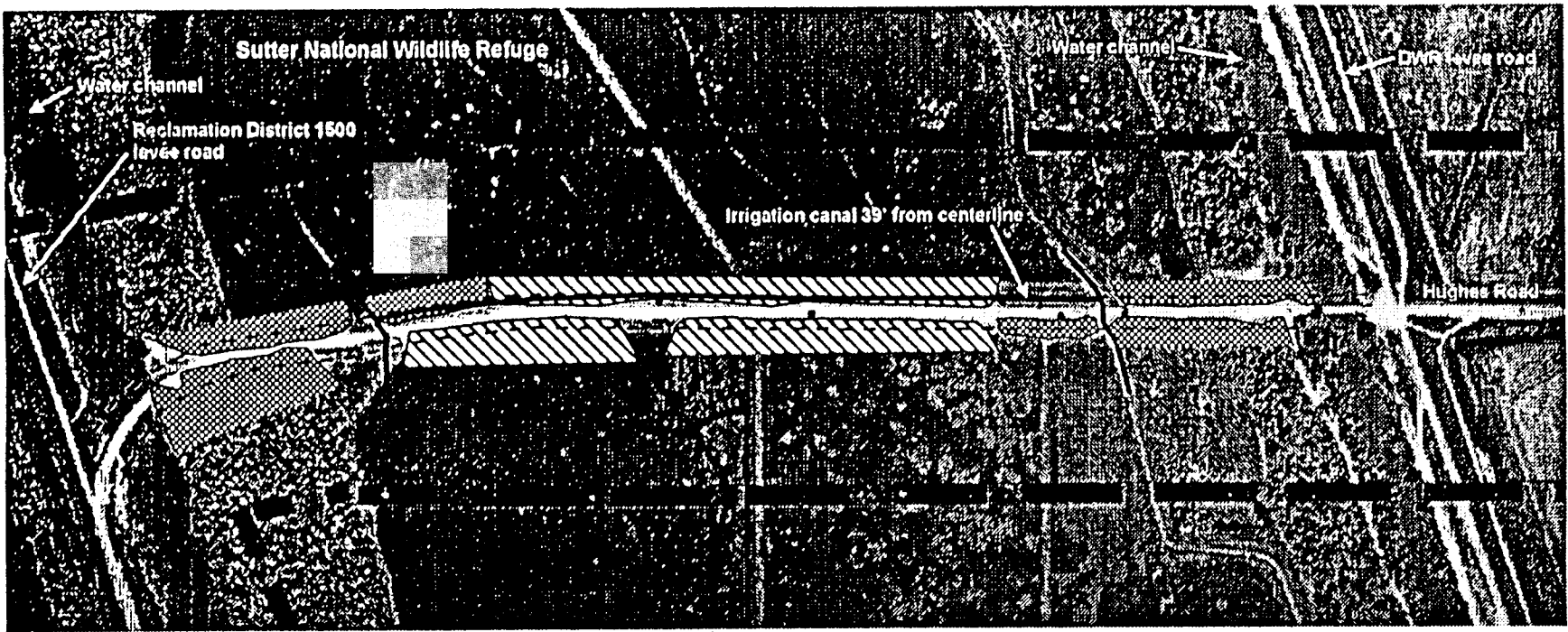
### 3.2 THREATENED AND ENDANGERED SPECIES HABITATS

Review of the USFWS list of threatened or endangered species that could occur on or near the Sutter Power Plant project site indicated the potential for vernal pool fairy shrimp (*Branchinecta lynchi*) and vernal pool tadpole shrimp (*Lepidurus packardii*) to occupy

ponded areas on the site. The listed species of vernal pool fairy shrimp and vernal pool tadpole shrimp were not observed during the 1996-97 wet season. However, the Sutter Power Plant project site contains habitat for the non-listed vernal pool crustacean species, California linderiella (*Linderiella occidentalis*) in the form of seasonally ponded borrow pits and abandoned mosquito abatement ponds (Foster Wheeler Environmental 1997). Surveys for the cysts of the listed species will be conducted during the 1997 dry season.

The irrigation ditches within the utility corridors are considered habitat for the threatened giant garter snake (*Thamnophis gigas*) and colonies have been reported in Gilsizer Slough 2.5 miles southwest of the project site.

No federal or state listed plant species were observed in the Sutter Power Plant wetlands during the 1997 botanical surveys (Glazner 1997). One CNPS List 2 species, California Hibiscus (*Hibiscus lasiocarpus*) or rose-mallow, occurs in the gasoline utility corridor within the Sutter Bypass (CNDDDB 1997, Glazner 1997).



**LEGEND**





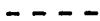

-  Riparian trees
-  Marsh
-  Irrigation canal
-  Tree
-  100' Hughes Road right-of-way
-  1,000' natural gas pipeline corridor



Figure 4. Wetlands and riparian habitat extending from Sutter National Wildlife Refuge into the Hughes Road right-of-way and construction area, Spring 1997.

## 4.0 CONCLUSION

The 77-acre Calpine property, including Greenleaf 1 and proposed Sutter Power Plant project site, contains 3.16 acres of excavated ponding features; abandoned borrow pits and mosquito abatement trenches, that show indicators of wetland vegetation, wetland hydrology, and hydric soils. Also present are 5.51 acres of naturally developing ponding features; degraded transitional vernal pools and degraded seasonal ponded depressions, which also show indicators of wetland vegetation, hydrology and hydric soils. A preliminary engineer's description of the project indicates the footprint of the plant site is approximately 12 acres in size and will cover approximately 2.1 acres of borrow pit and seasonal ponded depression wetlands.

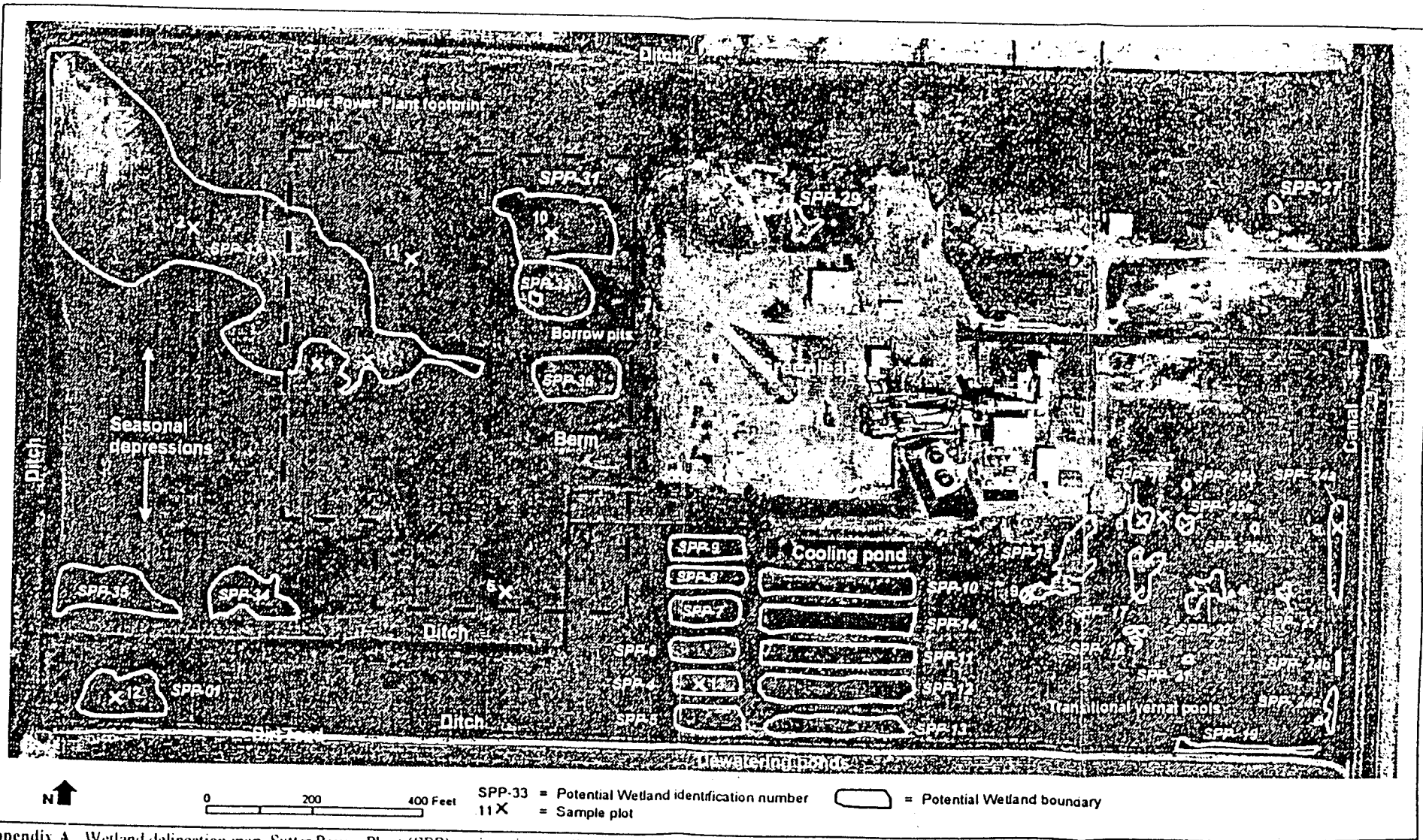
Each of the above mentioned wetland types have some habitat values. Three borrow pits, two mosquito abatement trenches, and one of the seasonal ponded depressions are habitat for the California linderiella. Muskrats, bullfrogs, American coots, mallards, and shorebirds were also observed foraging in these wetlands during surveys. The transitional vernal pools are habitat for aquatic crustaceans, insects, and popcorn flower. The large seasonal depression west of the Greenleaf 1 facility is forage habitat for raptors, where prey consists of song birds, meadow voles, mice, rats, and pocket gophers during the dry season.

The Sutter Wildlife Refuge wetlands extending into the Sutter County road right-of-way along Hughes Road can be avoided during construction of the PG&E natural gas pipeline. The natural gas pipeline will be placed under the pavement of Hughes Road and construction vehicles will be able to avoid wetlands by limiting access along the right-of-way.

## 5.0 REFERENCES

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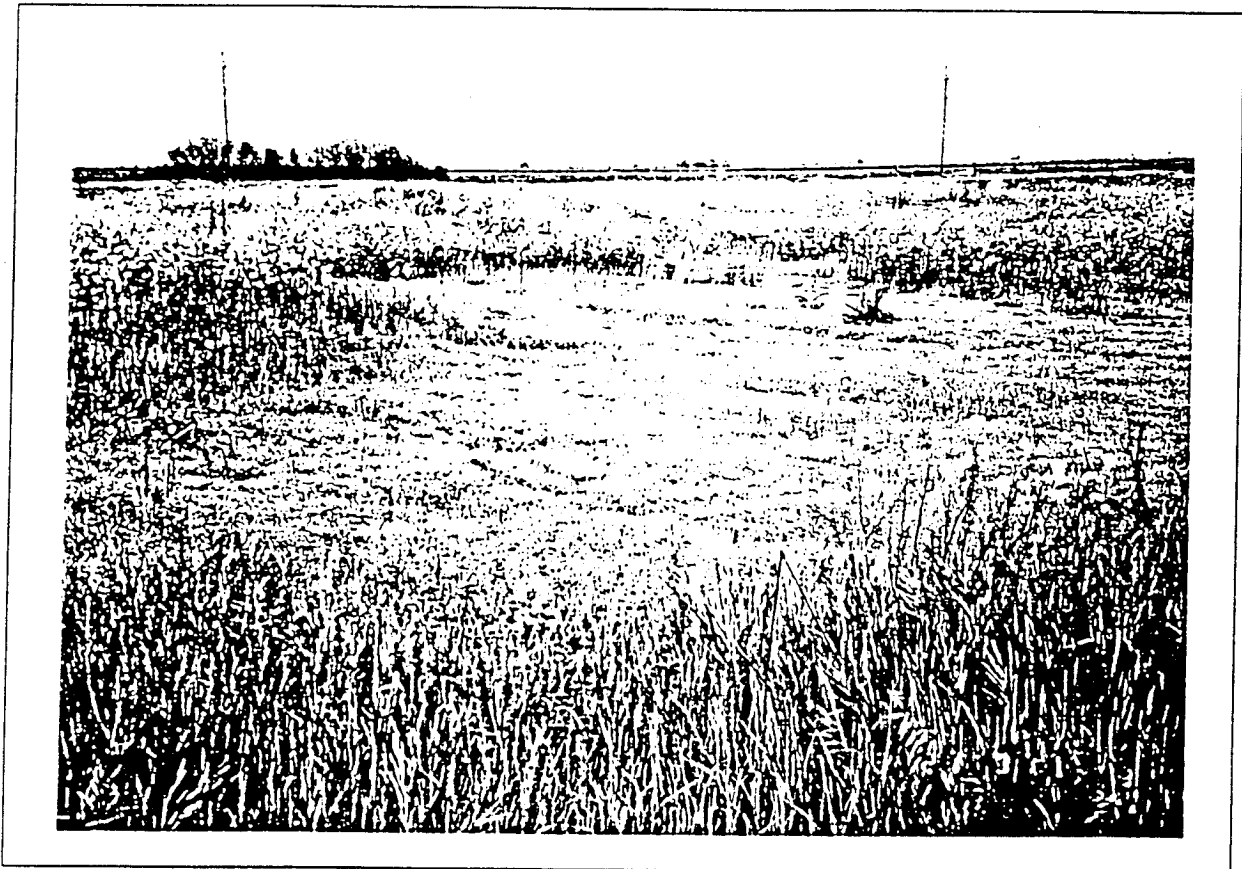
## APPENDIX A: PRELIMINARY WETLAND DELINEATION MAP



Appendix A. Wetland delineation map, Sutter Power Plant (SPP) project site (April 29, 1997)



**APPENDIX B: PHOTOGRAPHS OF POTENTIAL WETLANDS ON  
THE SUTTER POWER PLANT PROJECT SITE**



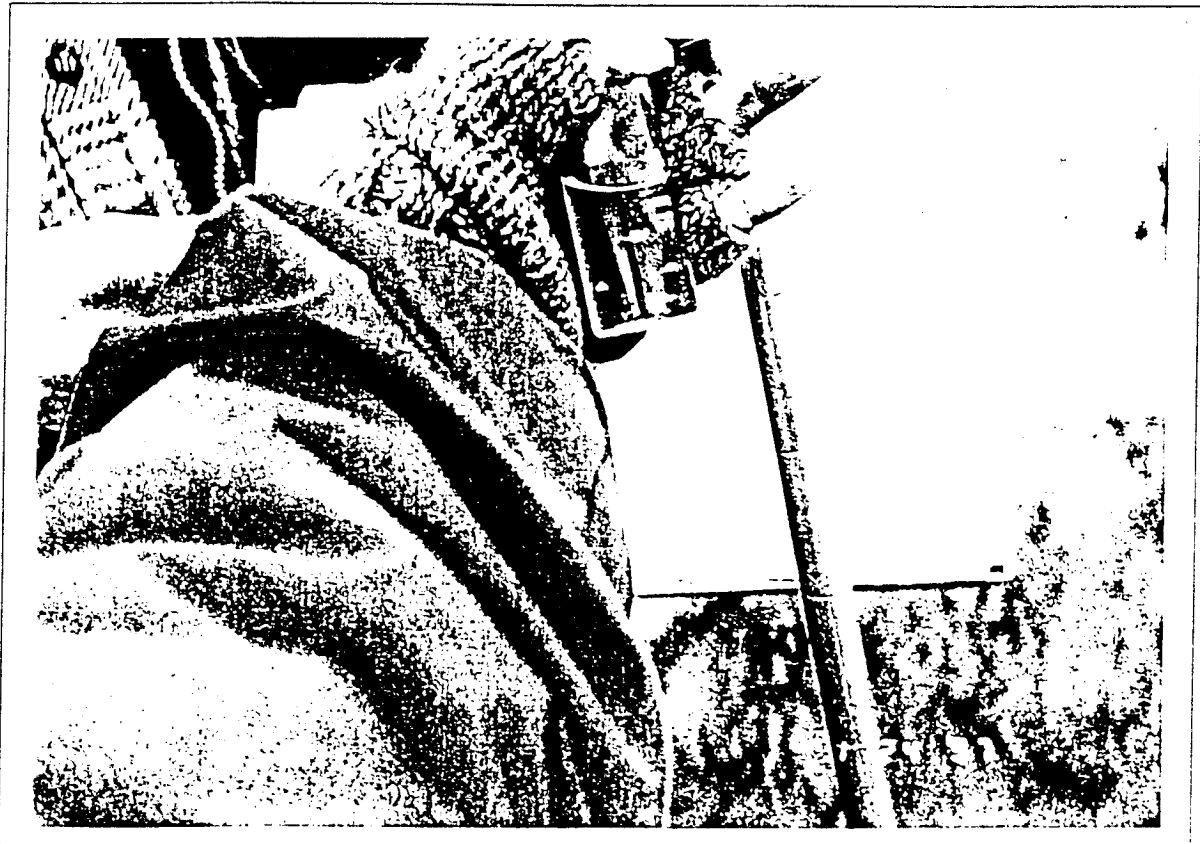
Appendix B-1. Transitional vernal pool (SPP-16) in southeast corner of Sutter Power Plant project site showing popcorn flower (*Plagiobothrys stipitatus* var. *micranthus*) and boundary of yellow mustard in upland areas, March 31, 1997.



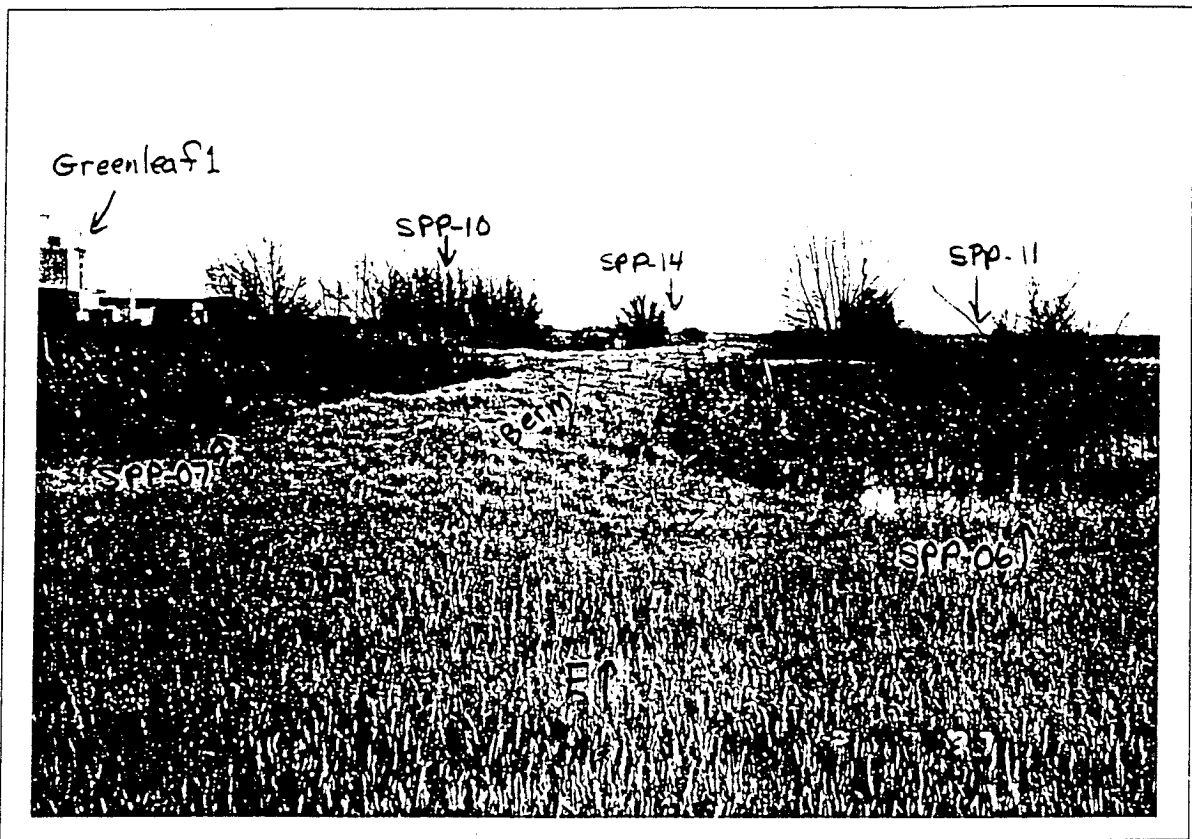
Appendix B-2. Seasonal ponded depression (SPP-19) in southeast corner of Sutter Power Plant project site showing tufted foxtail (*Alopecurus carolinianus*) and annual bluegrass (*Poa annua*), March 21, 1997.



Appendix B-3. Borrow pits (SPP-31 and SPP-32) west of the Greenleaf 1 facility showing ponding during the 1996-97 wet season, January 24, 1997.



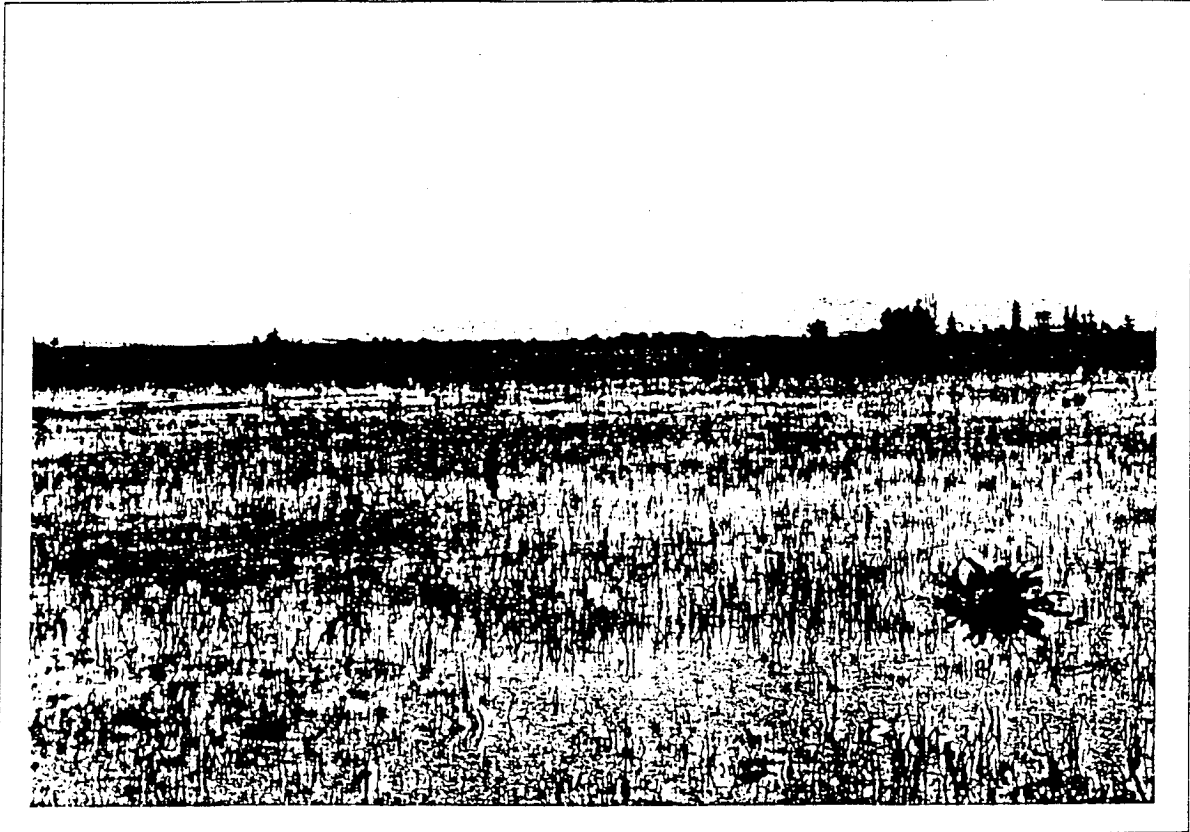
Appendix B-4 California linderiella (*Lindleriella occidentalis*) found in borrow pit SPP-31, January 24, 1997



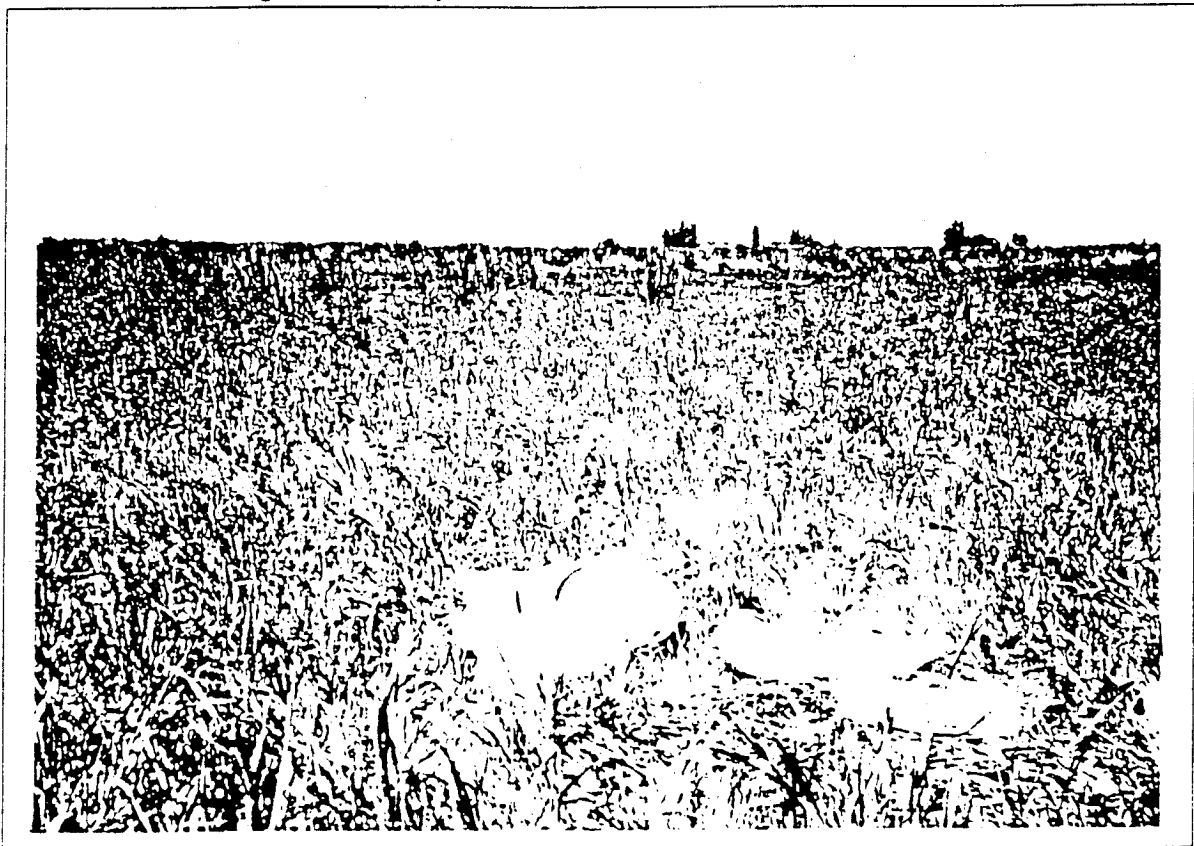
Appendix B-5. Abandoned mosquito abatement trenches south of Greenleaf 1 showing ponding and dormant willows (*Salix* sp.), cottonwoods (*Populus fremontii*), and cattails (*Typha latifolia*), February 7, 1997.



Appendix B-6. Seasonal ponded depression (SPP-33) in former rice field showing ponding and non-distinct boundaries of wetland species. January 24, 1997



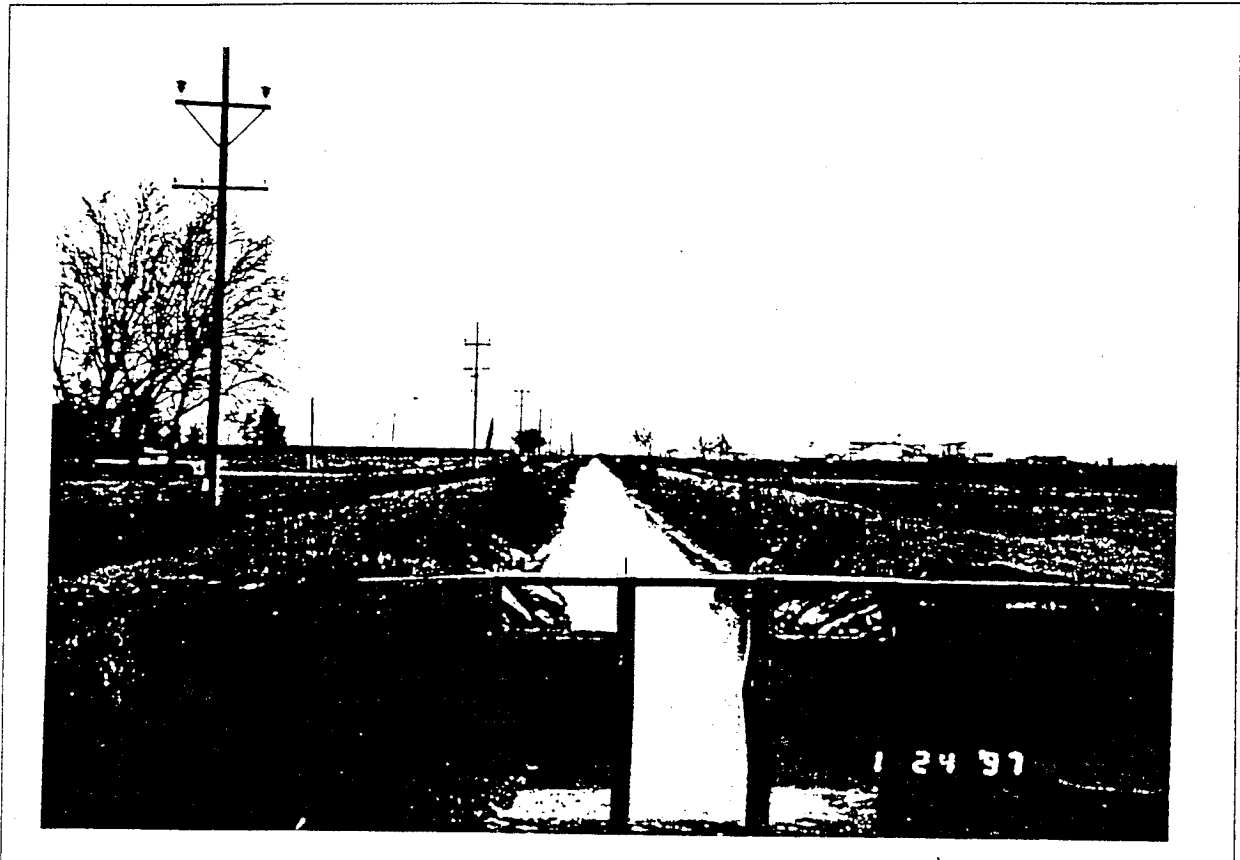
Appendix B-7. Seasonal ponded depression (SPP-33) during wet season showing ponding and Sutter Buttes in background, January 24, 1997.



Appendix B-8 View of seasonal ponded depression (SPP-33) from Appendix B-7 in the blooming season showing weedy wetland species, curly dock (*Rumex crispus*), Johnsongrass (*Sorghum halepense*), and tufted foxtail (*Alopecurus carolinianus*). April 3, 1997



Appendix B-9.  
Agricultural ditch on  
the north boundary  
showing annual burn  
effects by rice farmers,  
March 31, 1997.

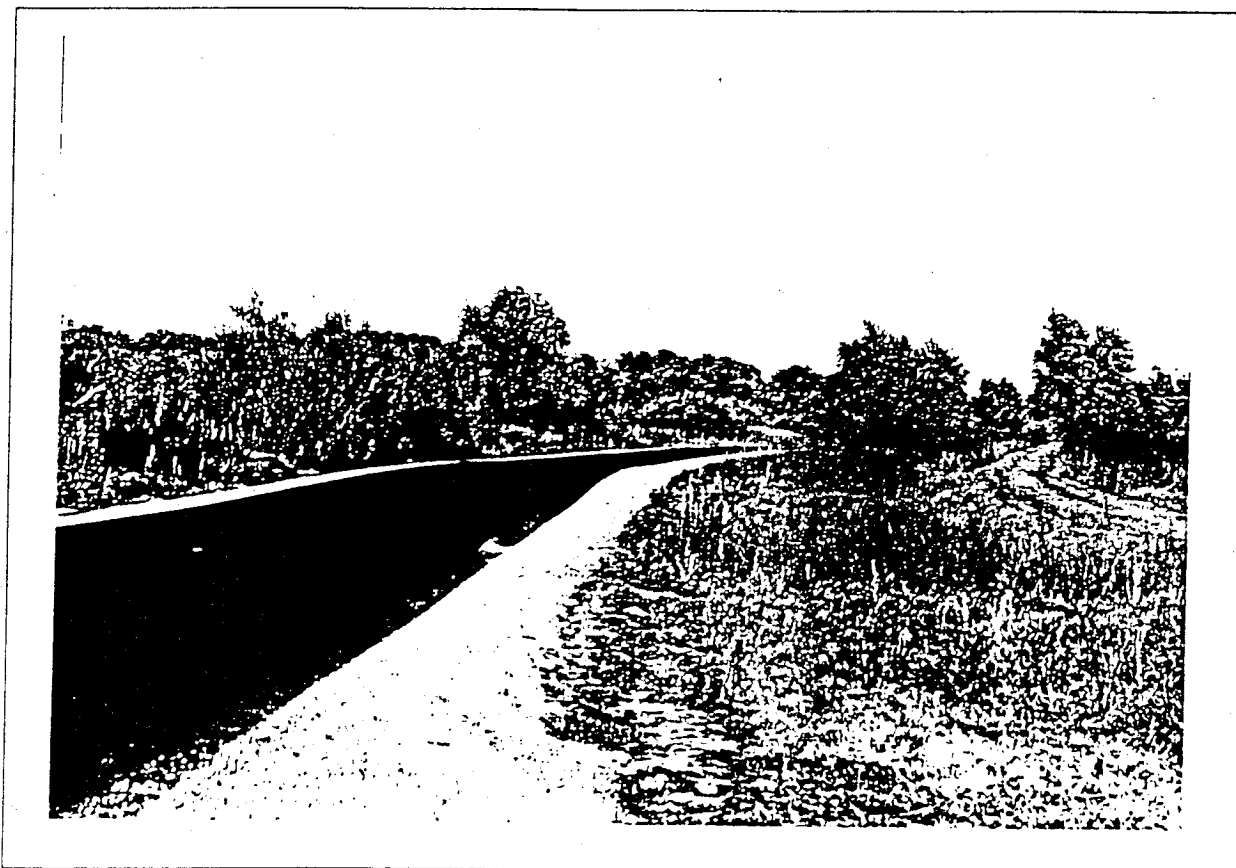


Appendix B-10. Agricultural ditch on the east property boundary showing low water level during 1996-97 wet season, January 24, 1997.





Appendix B-11.  
Looking west at  
drainage ditch in south-  
central portion of the  
Sutter Power Plant  
project site draining  
water from the cooling  
pond, March 21, 1997.



Appendix B-12. Hughes Road through the Sutter National Wildlife Refuge showing emergent marsh and riparian habitat within the road right-of-way, May 9, 1997.

DATA FORM  
 ROUTINE WETLAND DETERMINATION  
 (1987 COE Wetlands Delineation Manual)

Project/Site: <u>Sutter Power Plant</u> Applicant/Owner: <u>Calpine Corp</u> Investigator: <u>D. Crowe, J. Glazner</u>	Date: <u>4/3/97</u> County: <u>Sutter</u> State: <u>CA</u>
Do Normal Circumstances exist on the site? <span style="float: right;">(Yes) No</span> Is the site significantly disturbed (Atypical Situation)? <span style="float: right;">Yes (No)</span> Is the area a potential Problem Area? <span style="float: right;">(Yes) No</span> (If needed, explain on reverse.)	Community ID: <u>Fallow former Rice fields</u> Transect ID: <u>Pod 33</u> Plot ID: <u>01</u> <u>NW portion of site</u>

Rice fields  
Annual grass  
& forbes

4.19 acres

VEGETATION

Dominant Plant Species	% cover	Indicator	Other Dominant Plant Species	Stratum	Indicator
1. <u>Rumex crispus</u>	<u>50</u>	<u>FACW-</u>	9. <u>Lythrum hyssopifolium</u>	<u>10</u>	
2. <u>bare cracked ground</u>	<u>50</u>	<u>-</u>	10. <u>Cyperus sp.</u>	<u>10</u>	
3. _____			11. <u>Geranium dissectum</u>	<u>7</u>	
4. _____			12. <u>Wetland seedlings (unk)</u>	<u>+</u>	
5. _____			13. <u>Convolvulus arvensis</u>	<u>5</u>	
6. _____			14. <u>Veronica perigrinus</u>	<u>1</u>	
7. _____			15. <u>Cardamine oblongifolia</u>	<u>+</u>	
8. _____			16. _____		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks: Crayfish holes/skeletons in area. Vegetation is young seedlings in cracked soil.

HYDROLOGY

<input checked="" type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Other <input type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input checked="" type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Onft Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations:  Depth of Surface Water: <u>in wet season 21 cm</u> (in.) Depth to Free Water in Pit: <u>4/97 &gt; 16"</u> (in.) Depth to Saturated Soil: <u>4/97 &gt; 16"</u> (in.)	

Remarks: Saturation/Ponding for the area was recorded during 1996-97 vernal pool chertoxean surveys. (>43 days) at 15-21cm. The Plot 01 is in area of depression that ponded water the longest.

Plot 01

SOILS

Map Unit Name (Series and Phase): Gridley clay loam Drainage Class: mod well drained  
 Taxonomy (Subgroup): \_\_\_\_\_ Field Observations Confirm Mapped Type?  Yes  No

Oswald inclusion

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-1"		10YR 3/2	-		sandy clay loam
1-8"		10YR 3/1	-	occasional	sandy clay loam
8-16"		10YR 3/2	-		clay - moist

- Hydric Soil Indicators:
- Histic Epipedon
  - Sulfidic Odor
  - Aquic Moisture Regime
  - Reducing Conditions
  - Gleyed or Low-Chroma Colors
  - Concretions sparse
  - High Organic Content in Surface Layer in Sandy Soils
  - Organic Streaking in Sandy Soils
  - Listed on Local Hydric Soils List
  - Listed on National Hydric Soils List
  - Other (Explain in Remarks)

Remarks: The portion of depression appears to be the lowest part next to ditch berm. This area stays inundated longest - NW property corner. Soil diked 3 times a year.

WETLAND DETERMINATION

Hydrophytic Vegetation Present?  Yes  No (Circle)  
 Wetland Hydrology Present?  Yes  No  
 Hydric Soils Present?  Yes  No  
 Is this Sampling Point Within a Wetland?  Yes  No (Circle)

Remarks: This area seasonally ponds water during the wet season. It is diked 3 times a year. It was farmed in rice since 1800's, has been fallow for 50 yrs. *Lindberella occidentalis* were observed here during 1996-97 wet season. Possible Oswald inclusion area.

DATA FORM  
 ROUTINE WETLAND DETERMINATION  
 (1987 COE Wetlands Delineation Manual)

Project Site: <u>Sutter Power Plant</u> Applicant/Owner: <u>Calpine Corp.</u> Investigator: <u>D. Crowe, J. Glazner</u>	Date: <u>4/3/97</u> County: <u>Sutter</u> State: <u>California</u>
Do Normal Circumstances exist on the site? <span style="margin-left: 20px;"><input checked="" type="radio"/> Yes</span> <span style="margin-left: 20px;"><input type="radio"/> No</span> Is the site significantly disturbed (Atypical Situation)? <span style="margin-left: 20px;"><input type="radio"/> Yes</span> <span style="margin-left: 20px;"><input checked="" type="radio"/> No</span> Is the area a potential Problem Area? <span style="margin-left: 20px;"><input checked="" type="radio"/> Yes</span> <span style="margin-left: 20px;"><input type="radio"/> No</span> (If needed, explain on reverse.)	Community ID: <u>Annual grass/forbes</u> Transect ID: <u>Pool 33</u> Plot ID: <u>02</u>

fallow  
rice field

VEGETATION

Dominant Plant Species	<sup>% cover</sup> <del>Stratum</del>	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Convolvulus arvensis</u>	30	UPL	9. <u>Rumex crispus</u>	10	FACW-
2. <u>Cardamine oligosperma</u>	30	FACW	10. <u>Phalaris</u>	s	tr
3. <u>Veronica peregrina</u>	30	OBL	11. _____		
4. <u>Callitriche marginata</u>	30	OBL	12. _____		
5. <u>Alopecurus carolinianus</u>	30	FACW	13. _____		
6. _____			14. _____		
7. _____			15. _____		
8. _____			16. _____		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 4/5 = 80%

Remarks: Soil disked annually for fire control

HYDROLOGY

<input checked="" type="checkbox"/> Recorded Date (Describe in Remarks): ___ Stream, Lake, or Tide Gauge ___ Aerial Photographs <input checked="" type="checkbox"/> Other <u>Ponding observed during wet season</u> ___ No Recorded Data Available	<b>Wetland Hydrology Indicators:</b> <b>Primary Indicators:</b> <input checked="" type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches ___ Water Marks ___ Drift Lines ___ Sediment Deposits ___ Drainage Patterns in Wetlands <b>Secondary Indicators (2 or more required):</b> ___ Oxidized Root Channels in Upper 12 Inches ___ Water-Stained Leaves ___ Local Soil Survey Data ___ FAC-Neutral Test ___ Other (Explain in Remarks)
<b>Field Observations:</b> Depth of Surface Water: <u>during wet season 21cm+</u> Depth to Free Water in Pit: <u>&gt; 14</u> (in.) Depth to Saturated Soil: <u>5/4/97 &gt; 14</u> (in.)	

Remarks: Saturation + ponding observed during vernal pool crustacean surveys throughout the 1996-97 wet season

Plot 02

SOILS

Map Unit Name (Series and Phase): Gidley clay loam Drainage Class: mod well-drained  
 Field Observations Confirm Mapped Type?  Yes  No

*Oswald inclusion*

Profile Description:		Matrix Color	Mottle Colors	Mottle	Texture, Concretions, Structure, etc.
Depth (inches)	Horizon	(Munsell Moist)	(Munsell Moist)	Abundance: Contrast	
0-6"		10YR 3/2	10YR 1/4/3	5%	clay loam
6-14"		10YR 3/1	-	-	clay loam

Hydric Soil Indicators:

<input type="checkbox"/> Histosol	<input type="checkbox"/> Concretions
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils
<input type="checkbox"/> Aquic Moisture Regime	<input type="checkbox"/> Listed on Local Hydric Soils List
<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> Listed on National Hydric Soils List
<input checked="" type="checkbox"/> Gleyed or Low-Chrome Colors	<input type="checkbox"/> Other (Explain in Remarks)

Remarks: *Soil disked 3 times a year, was farmed in rice > 100 yrs*

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No (Circle)	Is this Sampling Point Within a Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No (Circle)
Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	
Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	

Remarks: *This area seasonally ponds water. during winter Linderilla occidentalis were observed during 1996-97 next season The area is disked 3 times a year*

DATA FORM  
 ROUTINE WETLAND DETERMINATION  
 (1987 COE Wetlands Delineation Manual)

Project/Site: <u>Sutter Power Plant</u> Applicant/Owner: <u>Calpine Corp</u> Investigator: <u>D. Crowe J. Glazner</u>	Date: <u>4/3/97</u> County: <u>Sutter</u> State: <u>California</u>
Do Normal Circumstances exist on the site? <span style="float: right;"><input checked="" type="radio"/> Yes <input type="radio"/> No</span> Is the site significantly disturbed (Atypical Situation)? <span style="float: right;"><input type="radio"/> Yes <input checked="" type="radio"/> No</span> Is the area a potential Problem Area? <span style="float: right;"><input checked="" type="radio"/> Yes <input type="radio"/> No</span> (If needed, explain on reverse.)	Community ID: <u>Annual grass/forbes</u> Transect ID: <u>Pool 33</u> Plot ID: <u>Plot 03</u> <i>at edge of Pool 33</i>

*fallow  
meadow*

VEGETATION

Dominant Plant Species	% cover Stratum	Indicator	Dominant Plant Species	% cover Stratum	Indicator
1. <u>Phalaris lemmonii</u>	<u>25</u>	<u>FACW-</u>	9. <u>Lycium hyssopifolium</u>	<u>5</u>	_____
2. <u>Alopecurus carolinianus</u>	<u>40</u>	<u>FACW</u>	10. <u>Veronica perigrinus</u>	<u>5</u>	_____
3. <u>Poa annua</u>	<u>60</u>	<u>FACW-</u>	11. <u>Ranunculus maricatus</u>	<u>10</u>	_____
4. <u>Convolvulus arvensis</u>	<u>20</u>	<u>UPL</u>	12. <u>Rumex crispus</u>	<u>5</u>	_____
5. _____	_____	_____	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 3/4 = 75%

Remarks: Plot in area of noticeably lower veg height - decreased amount of Rumex

HYDROLOGY

<input checked="" type="checkbox"/> Recorded Date (Describe in Remarks): _____ Stream, Lake, or Tide Gauge _____ Aerial Photographs <input checked="" type="checkbox"/> Other <u>Wet Season Survey for fairy/shrimp</u> _____ No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input checked="" type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches _____ Water Marks _____ Dnft Lines _____ Sediment Deposits _____ Drainage Patterns in Wetlands Secondary Indicators (2 or more required): _____ Oxidized Root Channels in Upper 12 Inches _____ Water-Stained Leaves _____ Local Soil Survey Data _____ FAC-Neutral Test _____ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: <u>in wet season</u> <u>21cm</u> (in.) Depth to Free Water in Pit: <u>&gt;10"</u> (in.) Depth to Saturated Soil: <u>&gt;10"</u> (in.)	Remarks: <u>Saturation/ponding was recorded during the 1996-97 wet season for vernal pool crustacean surveys at 15-21cm</u> <u>Plot 3 is at the edge</u>

Plot 03

SOILS

Map Unit Name (Series and Phase): Gridley Clay loam Drainage Class: mod well-drained  
 Field Observations Confirm Mapped Type?  Yes  No

Oswald inclusion

Profile Description:		Matrix Color	Mottle Colors	Mottle	Texture, Concretions, Structure, etc.
Depth (inches)	Horizon	(Munsell Moist)	(Munsell Moist)	Abundance/Contrast	
0-4"		10YR 4/2	10YR 6/4	20%	sandy clay loam
4-10"		10YR 3/2	7.5YR 4/6	30%	sandy clay loam

Hydric Soil Indicators:

<input type="checkbox"/> Histosol	<input type="checkbox"/> Concretions
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils
<input type="checkbox"/> Aquic Moisture Regime	<input type="checkbox"/> Listed on Local Hydric Soils List
<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> Listed on National Hydric Soils List
<input checked="" type="checkbox"/> Gleyed or Low-Chrome Colors	<input type="checkbox"/> Other (Explain in Remarks)

Remarks: Soil disked 3 times a year - was farmed in rice > 100 yrs

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No (Circle)	Is this Sampling Point Within a Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No
Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	
Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	

Remarks: This area seasonally ponds water during the winter wet season. Linderidella occidentalis were observed during the 1996-97 wet season. The area is disked 3 times a year.



DATA FORM  
 ROUTINE WETLAND DETERMINATION  
 (1987 COE Wetlands Delineation Manual)

Project/Site: <u>Sutter Power Plant</u> Applicant/Owner: <u>Calpine Corporation</u> Investigator: <u>D. Crowe, J. Glazner</u>	Date: <u>4/3/97</u> County: <u>Sutter</u> State: <u>California</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No Is the area a potential Problem Area? <input checked="" type="radio"/> Yes <input type="radio"/> No (If needed, explain on reverse.)	Community ID: <u>Annual grass/forbes</u> Transect ID: <u>Plot 33 upland</u> Plot ID: <u>Plot 04</u> <u>Upland plot</u> (photo)

*fallow  
rice-field*

VEGETATION

Dominant Plant Species	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Avena fatua</u>	<u>60</u>	<u>UPL</u>	9. _____	_____	_____
2. <u>Poa annua</u>	<u>30</u>	<u>FACW-</u>	10. _____	_____	_____
3. <u>Sorghum halepense</u>	<u>20</u>	<u>FACU</u>	11. _____	_____	_____
4. <u>Alopecurus carolinianus</u>	<u>20</u>	<u>FACW</u>	12. _____	_____	_____
5. <u>Rumex crispus</u>	<u>20</u>	<u>FACW</u>	13. _____	_____	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 60%

Remarks: Avena most characteristic for the area

HYDROLOGY

<input checked="" type="checkbox"/> Recorded Date (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Other <u>Wet season surveys for fairy shrimp</u> <input type="checkbox"/> No Recorded Date Available	<b>Wetland Hydrology Indicators:</b> <b>Primary Indicators:</b> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Dnft Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands <b>Secondary Indicators (2 or more required):</b> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
<b>Field Observations:</b>  Depth of Surface Water: <u>0</u> (in.) Depth to Free Water in Pit: <u>&gt; 10"</u> (in.) Depth to Saturated Soil: <u>&gt; 10"</u> (in.)	

Remarks: Area did not pond water during the wet season and is approx 6-12" higher in elevation than adjacent wetlands

Plot 04 - upland

SOILS

Map Unit Name (Series and Phase): Nisdale Clay Loam Drainage Class: Well drained  
 Field Observations: Confirm Mapped Type? Yes) No

Taxonomy (Subgroup): \_\_\_\_\_

Profile Description:		Matrix Color	Mottle Colors	Mottle	Texture, Concretions, Structure, etc.
Depth (inches)	Horizon	(Munsell Moist)	(Munsell Moist)	Abundance/Contrast	
0-6"		10YR 4/2	10YR 6/4	10%	sandy clay loam
6-10"		10YR 3/2	7.5YR 4/6	20%	sandy clay loam

Hydric Soil Indicators:

- Histosol
- Histic Epipedon
- Sulfidic Odor
- Aquic Moisture Regime
- Reducing Conditions
- Gleyed or Low-Chroma Colors
- Concretions
- High Organic Content in Surface Layer in Sandy Soils
- Organic Streaking in Sandy Soils
- Listed on Local Hydric Soils List
- Listed on National Hydric Soils List
- Other (Explain in Remarks)

Remarks: Soil was farmed in rice since 1800's and is disked 3 times a year

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No (Circle)	(Circle)
Wetland Hydrology Present? <input type="radio"/> Yes <input checked="" type="radio"/> No	
Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	Is this Sampling Point Within a Wetland? Yes <input checked="" type="radio"/> No

Remarks: This area shows indicators of wetland vegetation and soils. The low chroma in the soils may have formed over the past 190± yrs from rice farming. Wetland plant species indicated a subtle transition zone between upland & wetland

DATA FORM  
 ROUTINE WETLAND DETERMINATION  
 (1987 COE Wetlands Delineation Manual)

Project/Site: <u>Sutter Power Plant</u> Applicant/Owner: <u>Calpine Corporation</u> Investigator: <u>D. Crouse, J. Glazner</u>	Date: <u>4/3/97</u> County: <u>Sutter</u> State: <u>California</u>
Do Normal Circumstances exist on the site? <span style="float: right;"><input checked="" type="radio"/> Yes <input type="radio"/> No</span> Is the site significantly disturbed (Atypical Situation)? <span style="float: right;"><input type="radio"/> Yes <input checked="" type="radio"/> No</span> Is the area a potential Problem Area? (If needed, explain on reverse.) <span style="float: right;"><input checked="" type="radio"/> Yes <input type="radio"/> No</span>	Community ID: <u>annual grassland</u> Transect ID: <u>300' N of border SW of Green</u> Plot ID: <u>Plot 05</u> <u>Upland</u> <u>(photo)</u>

SW of Green  
400'  
fallow rice field

VEGETATION

Dominant Plant Species	% cover Stratum	Indicator	Other Dominant Plant Species	% cover Stratum	Indicator
1. <u>Avena fatua</u>	<u>20</u>	<u>UPL</u>	9. <u>Medicago sp.</u>	<u>15</u>	
2. <u>Bromus diandrus</u>	<u>90</u>	<u>UPL</u>	10. _____		
3. _____			11. _____		
4. _____			12. _____		
5. _____			13. _____		
6. _____			14. _____		
7. _____			15. _____		
8. _____			16. _____		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 0%

Remarks: Area is approx 6-12 inches higher in elevation than surrounding seasonal wetlands.

HYDROLOGY

<input checked="" type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Other <u>Wet season vernal pool shrimp surveys</u> <input type="checkbox"/> No Recorded Data Available	<b>Wetland Hydrology Indicators:</b> <b>Primary Indicators:</b> <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands <b>Secondary Indicators (2 or more required):</b> <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
<b>Field Observations:</b>  Depth of Surface Water: <u>0</u> (in.) Depth to Free Water in Pit: <u>&gt;12"</u> (in.) Depth to Saturated Soil: <u>&gt;16"</u> (in.)	

Remarks: No ponding was observed in this area during the 1996-97 wet season.

Plot 05 - upland

SOILS

Map Unit Name (Series and Phase): <u>Tisdale Clay Loam</u>		Drainage Class: <u>well-drained</u>			
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? Yes No			
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance: Contrast	Texture, Concretions, Structure, etc.
0-4"		10YR 4/2	10YR 6/4	10%	Sandy clay loam
4-16"		10YR 4/1	10YR 4/6	20%	clay loam
Hydric Soil Indicators:					
<input type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Sulfidic Odor <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors		<input type="checkbox"/> Concretions <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric Soils List <input type="checkbox"/> Other (Explain in Remarks)			
Remarks: Soil was farmed in rice since 1800's and is disked 3 times a year					

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (Circle)	Is this Sampling Point Within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (Circle)
Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (Circle)	
Hydric Soils Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (Circle)	
Remarks: This area is distinctly higher in elevation than surrounding wetlands. The soil here shows low chroma, as in hydric soils, and may be caused from 190 ± yrs of rice farming.	

DATA FORM  
 ROUTINE WETLAND DETERMINATION  
 (1987 COE Wetlands Delineation Manual)

Project/Site: <u>Sutter Power Plant</u> Applicant/Owner: <u>Calpine Corporation</u> Investigator: <u>D. Crowl, J. Glazner</u>	Date: <u>4/3/97</u> County: <u>Sutter</u> State: <u>California</u>
Do Normal Circumstances exist on the site? <span style="float: right;">Yes <input type="radio"/> No <input type="radio"/></span> Is the site significantly disturbed (Atypical Situation)? <span style="float: right;">Yes <input type="radio"/> No <input checked="" type="radio"/></span> Is the area a potential Problem Area? <span style="float: right;">Yes <input checked="" type="radio"/> No <input type="radio"/></span> (If needed, explain on reverse.)	Community ID: <u>annual grassland</u> Transect ID: <u>Pool 16</u> Plot ID: <u>Plot 06</u> acres = 0.03

grassland  
fallow  
ricefield

VEGETATION

Dominant Plant Species	% Cover <small>Subtotal</small>	Indicator	Other Dominant Plant Species	% Cover <small>Subtotal</small>	Indicator
1. <u>Plagiobothrys stipitatus</u>	<u>99%</u>	<u>OBL</u>	9. <u>Lupinus bicolor</u>	<u>tr</u>	
2. <u>var. micrathus</u>			10. <u>Achyrochaena mollis</u>	<u>tr</u>	
3. <u>Cardamine oligosperma</u>	<u>25</u>	<u>FACW</u>	11. <u>Convolvulus</u>	<u>15</u>	
4. <u>Poa annua</u>	<u>90</u>	<u>FACW-</u>	12. <u>Phalaris</u>	<u>tr</u>	
5. <u>Alopecurus carolinianus</u>	<u>25</u>	<u>FACW</u>	13. <u>Lolium multiflorum</u>	<u>tr</u>	
6. _____			14. _____		
7. _____			15. _____		
8. _____			16. _____		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks: Distinct vegetation boundaries at edge of pool  
Area disked 3 times a year.

HYDROLOGY

<input checked="" type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Other <u>1996-97 wet season vernal pool shrimp surveys</u> <input type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input checked="" type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Dnft Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: <u>wet season</u> <u>15 cm</u> <small>ft.</small> Depth to Free Water in Pit: <u>4/97</u> <u>&gt; 12"</u> (in.) Depth to Saturated Soil: <u>&gt; 12"</u> (in.)	
Remarks: <u>Ponding and saturation was observed and recorded during the 1996-97 vernal pool crustacean surveys (&gt;43 days) at 15 cm and less. No vernal pool crustaceans observed.</u>	

Plot 06

SOILS

Map Unit Name (Series and Phase): Udall Clay Loam Drainage Class: well-drained  
 Field Observations: Confirm Mapped Type? Yes No

Taxonomy (Subgroup): \_\_\_\_\_

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance: Contrast	Texture, Concretions, Structure, etc.
0-6"		10YR 3/2	none		some gravel, loamy
6-12"		10YR 3/2	7.5YR 4/6	20%	loamy clay layer

Hydric Soil Indicators:

<input type="checkbox"/> Histosol	<input type="checkbox"/> Concretions
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils
<input type="checkbox"/> Aquic Moisture Regime	<input type="checkbox"/> Listed on Local Hydric Soils List
<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> Listed on National Hydric Soils List
<input checked="" type="checkbox"/> Gleyed or Low-Chrome Colors	<input type="checkbox"/> Other (Explain in Remarks)

Remarks: Unconsolidated, gravel in upper layer. Disked 3 times a year

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No (Circle)	Is this Sampling Point Within a Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No (Circle)
Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	
Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	

Remarks: This seasonally ponded depression exhibits characteristics of wetland vegetation, hydrology, & soils. It is disked annually but retains a visible definition between wetland & upland vegetation.

DATA FORM  
 ROUTINE WETLAND DETERMINATION  
 (1987 COE Wetlands Delineation Manual)

Project/Site: <u>Sutter Power Plant</u> Applicant/Owner: <u>Calpine Corporation</u> Investigator: <u>D. Crowe, J. Glazner</u>	Date: <u>4/3/97</u> County: <u>Sutter</u> State: <u>California</u>
Do Normal Circumstances exist on the site? <span style="float: right;"><input checked="" type="radio"/> Yes <input type="radio"/> No</span> Is the site significantly disturbed (Atypical Situation)? <span style="float: right;"><input checked="" type="radio"/> Yes <input type="radio"/> No</span> Is the area a potential Problem Area? <span style="float: right;"><input checked="" type="radio"/> Yes <input type="radio"/> No</span> (If needed, explain on reverse.)	Community ID: <u>Annual grassland</u> Transect ID: <u>Exp 1/10</u> - upland Plot ID: <u>Plot 07</u> - fallow <span style="float: right; font-style: italic;">Arice-fido</span>

VEGETATION

Dominant Plant Species	% cover	Indicator	Other Plant Species	% cover	Indicator
1. _____	_____	_____	9. <u>Avena fatua</u>	<u>5</u>	_____
2. <u>Bromus diandrus</u>	<u>60</u>	<u>UPL</u>	10. <u>Medicago</u>	<u>15</u>	_____
3. <u>Conyolus arvensis</u>	<u>40</u>	<u>UPL</u>	11. <u>Lolium multi</u>	<u>10</u>	_____
4. <u>Vulpia myuros</u>	<u>20</u>	<u>FACU</u>	12. <u>Rumex crispis</u>	<u>5</u>	_____
5. _____	_____	_____	13. <u>Sinapis arvensis</u>	<u>15</u>	_____
6. _____	_____	_____	14. _____	_____	_____
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 0%

Remarks: Area distinctly different in plant species than adjacent wetland

HYDROLOGY

<input checked="" type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Other <u>1996-97 wet season survey</u> <input type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations:  Depth of Surface Water: <u>0</u> (in.) Depth to Free Water in Pit: <u>&gt; 12</u> (in.) Depth to Saturated Soil: <u>&gt; 12</u> (in.)	
Remarks: <u>Area did not pond water during the wet season and is approx. 6 inches higher in elevation than adjacent wetlands</u>	

Plot 07 - upland

SOILS

Map Unit Name (Series and Phase): Tidal Clay loam Drainage Class: well-drained  
 Field Observations Confirm Mapped Type? Yes No

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance: Contrast	Texture, Concretions, Structure, etc.
0-6"		10YR 3/3	-	-	loamy
6-12"		10YR 3/2	7.5 YR 4/6	15%	dense clay

Hydric Soil Indicators:

<input type="checkbox"/> Histosol	<input type="checkbox"/> Concretions
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils
<input type="checkbox"/> Aquic Moisture Regime	<input type="checkbox"/> Listed on Local Hydric Soils List
<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> Listed on National Hydric Soils List
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Other (Explain in Remarks)

Remarks: Upland comparison area to Pool 16. The area was farmed in rice since the 1800's + disked 3 times a year. Soil shows evidence of inundation for >100 yrs from rice farming.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? Yes <input checked="" type="radio"/> No (Circle)	Is this Sampling Point Within a Wetland? Yes <input checked="" type="radio"/> No
Wetland Hydrology Present? Yes <input checked="" type="radio"/> No	
Hydric Soils Present? Yes <input checked="" type="radio"/> No	

Remarks: This upland site does not show indicators of wetland plants or hydrology. The low chroma in the soils may have formed over the 190± years of rice farming.



DATA FORM  
 ROUTINE WETLAND DETERMINATION  
 (1987 COE Wetlands Delineation Manual)

Project/Site: <u>Sutter Power Plant</u> Applicant/Owner: <u>Calpine Corporation</u> Investigator: <u>D. Crowe, J. Glasner</u>	Date: <u>4/3/97</u> County: <u>Sutter</u> State: <u>California</u>
Do Normal Circumstances exist on the site? <span style="float: right;"><input checked="" type="radio"/> Yes <input type="radio"/> No</span> Is the site significantly disturbed (Atypical Situation)? <span style="float: right;"><input checked="" type="radio"/> Yes <input type="radio"/> No</span> Is the area a potential Problem Area? <span style="float: right;"><input checked="" type="radio"/> Yes <input type="radio"/> No</span> (If needed, explain on reverse.)	Community ID: <u>annual grassland</u> Transect ID: <u>Plot 24</u> Plot ID: <u>Plot 08 - 10' of willows</u> <u>low edge of field - drainage</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator	Other Dominant Plant Species	Stratum	Indicator
1. <u>Geranium dissectum</u>	<u>30</u>	<u>u PL</u>	9. <u>Convolvulus arvensis</u>	<u>10</u>	
2. <u>Salix exigua</u>	<u>30</u>	<u>OBL</u>	10. <u>Avena fatua</u>	<u>10</u>	
3. <u>Poa annua</u>	<u>30</u>	<u>FACW-</u>	11. <u>Plantain (English)</u>	<u>tr</u>	
4. _____			12. _____		
5. _____			13. _____		
6. _____			14. _____		
7. _____			15. _____		
8. _____			16. _____		

Percent of Dominant Species that are OBL, FACW or FAC 2/3 = 60%  
 (excluding FAC-).

Remarks: low edge of field at base of canal berm. Vegetation in understory of sandbar willows. Area is just low enough to collect water. Alopecurus nearby

HYDROLOGY

<input checked="" type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Other <u>1996-97 wet season survey</u> <input type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input type="checkbox"/> Inundated <input type="checkbox"/> Saturated in Upper 12 Inches <input checked="" type="checkbox"/> Water Marks <u>on trees</u> <input type="checkbox"/> Dnft Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: <u>wet season 14-21cm</u> Depth to Free Water in Pit: <u>&gt; 12" (in.)</u> Depth to Saturated Soil: <u>&gt; 12" (in.)</u>	

Remarks: This area at the base of the canal berm was ponded/saturated for > 42 days during the wet season

Plot 08

SOILS

Map Unit Name (Series and Phase): <u>Tisdale Clay loam</u>		Drainage Class: <u>well drained</u>			
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? Yes No			
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-12"		9.5 YR 3/2	7.5 YR 4/6	10%	clay - (denser as it gets deeper)
Hydric Soil Indicators:					
<input type="checkbox"/> Histosol	<input type="checkbox"/> Concretions				
<input type="checkbox"/> Histic Epipedon	<input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils				
<input type="checkbox"/> Sulfidic Odor	<input type="checkbox"/> Organic Streaking in Sandy Soils				
<input type="checkbox"/> Aquic Moisture Regime	<input type="checkbox"/> Listed on Local Hydric Soils List				
<input type="checkbox"/> Reducing Conditions	<input type="checkbox"/> Listed on National Hydric Soils List				
<input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Other (Explain in Remarks)				
Remarks: East edge of field along fence line Disked annually and was farmed in rice since 1800's.					

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No (Circle)	(Circle)  Is this Sampling Point Within a Wetland? degraded <input checked="" type="radio"/> Yes <input type="radio"/> No
Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	
Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	
Remarks: This low area along the fence line + base of canal berm shows indicators of all 3 wetland criteria. However, it is degraded	

DATA FORM  
 ROUTINE WETLAND DETERMINATION  
 (1987 COE Wetlands Delineation Manual)

Project/Site: <u>Sutter Power Plant</u> Applicant/Owner: <u>Calpine Corporation</u> Investigator: <u>D. Crowe, J. Glazner</u>	Date: <u>4/3/97</u> County: <u>Sutter</u> State: <u>California</u>
Do Normal Circumstances exist on the site? <span style="float: right;"><input checked="" type="radio"/> Yes <input type="radio"/> No</span> Is the site significantly disturbed (Atypical Situation)? <span style="float: right;"><input type="radio"/> Yes <input checked="" type="radio"/> No</span> Is the area a potential Problem Area? <span style="float: right;"><input checked="" type="radio"/> Yes <input type="radio"/> No</span> (If needed, explain on reverse.)	Community ID: <u>annual grassland</u> Transect ID: <u>Pool 15</u> Plot ID: <u>Plot 09</u> <i>grassland fallow rice fields</i> Extension of culvert drainage feature

VEGETATION

Dominant Plant Species	% cover	Indicator	Other Dominant Plant Species	% cover	Indicator
1. <u>Plagiobothrys stipitatus</u>	<u>80</u>	<u>OBL</u>	9. <u>Cardamine oligosperma</u>	<u>10</u>	
2. <u>Conium maculatum</u>	<u>30</u>	<u>NI</u>	10. <u>Lupinus sp</u>	<u>12</u>	
3. <u>Phalaris paradoxa</u>	<u>20</u>	<u>NI</u>	11. <u>Veronica perigrina</u>	<u>5</u>	
4. <u>Alopecurus carolinianus</u>	<u>30</u>	<u>FACW</u>	12. _____		
5. <u>Poa annua</u>	<u>30</u>	<u>FAW</u>	13. _____		
6. _____			14. _____		
7. _____			15. _____		
8. _____			16. _____		

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 3/5 = 60%

Remarks: Area not ponded long (2 weeks) but was saturated - plot is in area that is an extension (overflow) of Pool 15 - the culvert drainage. (Drains pavement of parking lot)

HYDROLOGY

<input checked="" type="checkbox"/> Recorded Date (Describe in Remarks): ___ Stream, Lake, or Tide Gauge ___ Aerial Photographs <input checked="" type="checkbox"/> Other <u>1996-97 wet season</u> ___ No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input checked="" type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches ___ Water Marks ___ Drift Lines ___ Sediment Deposits ___ Drainage Patterns in Wetlands Secondary Indicators (2 or more required): ___ Oxidized Root Channels in Upper 12 Inches ___ Water-Stained Leaves ___ Local Soil Survey Data ___ FAC-Neutral Test ___ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: <u>wet season 28 cm</u> <del>feet</del> Depth to Free Water in Pit: <u>&gt; 4/97 &gt; 12"</u> (in.) Depth to Saturated Soil: <u>&gt; 12"</u> (in.)	

Remarks: A portion of the pool (15) contains water for an extended time at culvert exit only - Pacific tree frogs and crayfish inhabit the pool during the wet season

Pool 09

SOILS

Map Unit Name (Series and Phase): <u>Tisdale Clay loam</u>		Drainage Class: <u>well drained</u>			
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? Yes No			
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-6		10YR 3/2	-	-	loamy
6-12		10YR 3/2	7.5YR 4/6	faint + few	loamy/clay
Hydric Soil Indicators:					
<input type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Sulfidic Odor <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chrome Colors		<input type="checkbox"/> Concretions <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric Soils List <input type="checkbox"/> Other (Explain in Remarks)			
Remarks: <u>Plot is in a distinct basin. Area was farmed in rice since 1800's and disked 3 times a year.</u>					

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="radio"/> Yes <input type="radio"/> No (Circle)	(Circle) Is this Sampling Point Within a Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No
Wetland Hydrology Present?	<input checked="" type="radio"/> Yes <input type="radio"/> No	
Hydric Soils Present?	<input checked="" type="radio"/> Yes <input type="radio"/> No	
Remarks: <u>This pools shows characteristics of all three wetland criteria. Even though a portion of the pool is supported by runoff from a culvert, the entire pool is in a distinct basin feature.</u>		

DATA FORM  
 ROUTINE WETLAND DETERMINATION  
 (1987 COE Wetlands Delineation Manual)

Project/Site: <u>Sutter Power Plant</u> Applicant/Owner: <u>Calpine Corporation</u> Investigator: <u>D. Crowe, J. Glayser</u>	Date: <u>4/22/97</u> County: <u>Sutter</u> State: <u>California</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the site significantly disturbed (Atypical Situation)? <input checked="" type="radio"/> Yes <input type="radio"/> No Is the area a potential Problem Area? <input checked="" type="radio"/> Yes <input type="radio"/> No (If needed, explain on reverse.)	Community ID: <u>annual grassland in former rice field</u> Transect ID: <u>Pool 31</u> Plot ID: <u>Plot 10</u> <u>Borrow pit (W) of Greenleaf</u> <u>0.52 acres</u>

VEGETATION

Dominant Plant Species	% Cover Stratum	Indicator	Other Dominant Plant Species	% Stratum	Indicator
1. <u>Crypsis schoenoides</u>	<u>20</u>	<u>OBL</u>	9. <u>Abutilon theophrasti</u>	<u>5</u>	<u>NI</u>
2. _____	_____	_____	10. <u>Veronica perigrina</u>	<u>2</u>	<u>OBL</u>
3. _____	_____	_____	11. <u>Epilobium pygmaeum</u>	<u>2</u>	<u>OBL</u>
4. _____	_____	_____	12. <u>Crassula aquatica</u>	<u>2</u>	<u>OBL</u>
5. _____	_____	_____	13. <u>Pitularia americana</u>	<u>2</u>	<u>OBL</u>
6. _____	_____	_____	14. <u>Alopecurus carolinianus</u>	<u>2</u>	<u>FACW</u>
7. _____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	16. _____	_____	_____

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-): 100%

Remarks: Cover at data point = 20%. Most plants are very young and will increase the % cover.

HYDROLOGY

<input checked="" type="checkbox"/> Recorded Date (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Other <u>1996-97 wet season surveys</u> <input type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input checked="" type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: <u>wet season 50 cm (m.)</u> Depth to Free Water in Pit: <u>&gt; 4/97 &gt; 14 (in.)</u> Depth to Saturated Soil: <u>14 (in.)</u>	

Remarks: Area ponded water > 60 days. California Linderiella was observed in large amounts during the 1996-97 wet season.

SOILS

Plot 10

Map Unit Name (Series and Phase): <u>Gridley Clay loam</u>		Drainage Class: <u>mod well drained</u>			
Taxonomy (Subgroup): _____		Field Observations Confirm Mapped Type? Yes No			
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance: Contrast	Texture, Concretions, Structure, etc.
0-6		10YR 3/2	-	-	hard baked
6-10		10YR 3/2	7.5YR 3/1	30%	clay loam
10-14		10YR 3/2	-	-	clay

Hydric Soil Indicators:	
<input type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Sulfidic Odor <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	<input checked="" type="checkbox"/> Concretions <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric Soils List <input type="checkbox"/> Other (Explain in Remarks)

Remarks: Plot was taken in an area used as a borrow pit for construction of the Greenleaf 1 facility on site. It was left and not maintained for past 10 years.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No (Circle)	(Circle)
Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	
Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	Is this Sampling Point Within a Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No

Remarks: This area represents two other borrow pit sites in immediate vicinity. The areas were used for soil to make the base of Greenleaf 1 facility 10 years ago. The pits (from 50 to 75cm deep in wet season) show indicators of wetland characteristics. They were left unmaintained for past 10 years.

Plot 11

SOILS

Map Unit Name (Series and Phase): <u>Gridley clay loam</u>		Drainage Class: <u>mod well drained</u>			
Taxonomy (Subgroup): _____		Field Observations: <u>20% inclusions</u> Confirm Mapped Type? Yes No			
Profile Description:					
Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance: Contrast	Texture, Concretions, Structure, etc.
<u>0-5"</u>		<u>10YR 3/2</u>	<u>10YR 4/4</u>	<u>5%</u>	<u>loamy</u>
<u>5-10"</u>		<u>10YR 3/2</u>	<u>7.5YR 3/4</u>	<u>5%</u>	<u>loamy</u>
Hydric Soil Indicators:					
<input type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Sulfidic Odor <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or <u>Low-Chroma</u> Colors		<input type="checkbox"/> Concretions <input type="checkbox"/> High Organic Content in Surface Layer in Sandy Soils <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric Soils List <input type="checkbox"/> Other (Explain in Remarks)			
Remarks: <u>Area was formed in rice since 1800's and is disked 3 times a year.</u>					

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	<input checked="" type="radio"/> Yes	<input type="radio"/> No (Circle)			
Wetland Hydrology Present?	<input type="radio"/> Yes	<input checked="" type="radio"/> No			
Hydric Soils Present?	<input checked="" type="radio"/> Yes	<input type="radio"/> No		Is this Sampling Point Within a Wetland?	Yes <input type="radio"/> No <input checked="" type="radio"/>
Remarks: <u>This area shows indicators of wetland vegetation and soils. The low chroma in the soils may have formed over the 190+ years of rice farming. Wetland plant species indicate a subtle transition zone between upland + wetland.</u>					

DATA FORM  
 ROUTINE WETLAND DETERMINATION  
 (1987 COE Wetlands Delineation Manual)

Project/Site: <u>Sutter Power Plant</u>	Date: <u>4/22/97</u>
Applicant/Owner: <u>Calpine Corporation</u>	County: <u>Sutter</u>
Investigator: <u>D. Crowe, J. Blayner</u>	State: <u>California</u>
Do Normal Circumstances exist on the site? <input checked="" type="radio"/> Yes <input type="radio"/> No	Community ID: <u>Annual grassland</u> Transect ID: <u>0001</u> Plot ID: <u>Plot 12</u> SW corner of property
Is the site significantly disturbed (Atypical Situation)? <input type="radio"/> Yes <input checked="" type="radio"/> No	
Is the area a potential Problem Area? <input checked="" type="radio"/> Yes <input type="radio"/> No	
(If needed, explain on reverse.)	

*Annual grassland  
Fallow  
rice field*

0.26 ac

VEGETATION

Dominant Plant Species	<u>70 cover</u> <u>Silhouette</u>	Indicator	Other Dominant Plant Species	<u>70 cover</u> <u>Silhouette</u>	Indicator
1. <u>Pumex crispus</u>	<u>40</u>	<u>FACW</u>	9. <u>Conocaulus arvensis</u>	<u>5</u>	
2. <u>Sorghum halepense</u>	<u>20</u>	<u>FACU</u>	10. <u>Veronica perigrinus</u>	<u>10</u>	
3. _____			11. <u>Lythrum hyssopifolium</u>	<u>10</u>	
4. _____			12. <u>Alopecurus carolinianus</u>	<u>10</u>	
5. _____			13. <u>Digitaria sanguinalis</u>	<u>10</u>	
6. _____			14. <u>Atriplex patula</u>	<u>5</u>	
7. _____			15. <u>Bromus hordeatius</u>	<u>5</u>	
8. _____			16. <u>Verbena littoralis</u>	<u>or</u>	
			<u>Cyperus arigrosus</u>	<u>70</u>	
Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-):			<u>1/2 = 50%</u>		
Remarks: <u>Area is a low portion of field at base of canal berm. Plant species are "weedy" species.</u>					

HYDROLOGY

<input checked="" type="checkbox"/> Recorded Data (Describe in Remarks): <input type="checkbox"/> Stream, Lake, or Tide Gauge <input type="checkbox"/> Aerial Photographs <input checked="" type="checkbox"/> Other <u>1996-97 wet season surveys</u> <input type="checkbox"/> No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input checked="" type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches <input type="checkbox"/> Water Marks <input type="checkbox"/> Drift Lines <input type="checkbox"/> Sediment Deposits <input type="checkbox"/> Drainage Patterns in Wetlands Secondary Indicators (2 or more required): <input type="checkbox"/> Oxidized Root Channels in Upper 12 Inches <input type="checkbox"/> Water-Stained Leaves <input type="checkbox"/> Local Soil Survey Data <input type="checkbox"/> FAC-Neutral Test <input type="checkbox"/> Other (Explain in Remarks)
Field Observations: Depth of Surface Water: <u>wet season 19 cm</u> Depth to Free Water in Pit: <u>&gt; 4/97 &gt; 12 (in.)</u> Depth to Saturated Soil: <u>&gt; 12 (in.)</u>	
Remarks: <u>Area ponded water and contained crayfish from nearby canal during vernal pool crustacean surveys - no listed species observed.</u>	



Plot 12

SOILS

Map Unit Name (Series and Phase): Gridley clay loam Drainage Class: mod well drained  
 Field Observations: \_\_\_\_\_ Confirm Mapped Type? Yes No  
 Taxonomy (Subgroup): \_\_\_\_\_

Profile Description:		Matrix Color	Mottle Colors	Mottle	Texture, Concretions, Structure, etc.
Depth (inches)	Horizon	(Munsell Moist)	(Munsell Moist)	Abundance: Contrast	
<u>0-8"</u>		<u>10YR 3/2</u>	<u>-</u>	<u>-</u>	<u>Crumbly, sandy/loam</u>
<u>8-12"</u>		<u>7.5YR 3/1</u>	<u>7.5YR 3/3</u>	<u>15%</u>	<u>loamy clay</u>

Hydric Soil Indicators:

- Histosol
- Histic Epipedon
- Sulfidic Odor
- Aquic Moisture Regime
- Reducing Conditions
- Gleyed or Low-Chroma Colors
- Concretions
- High Organic Content in Surface Layer in Sandy Soils
- Organic Streaking in Sandy Soils
- Listed on Local Hydric Soils List
- Listed on National Hydric Soils List
- Other (Explain in Remarks)

Remarks: Area farmed in rice since 1800s and disked 3 times a year.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes <input type="radio"/> No (Circle)	Is this Sampling Point Within a Wetland? <input checked="" type="radio"/> Yes <input type="radio"/> No (Circle)
Wetland Hydrology Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	
Hydric Soils Present? <input checked="" type="radio"/> Yes <input type="radio"/> No	

Remarks: The area has indicators of wetland characteristics. It is a low area of the field that ponds water during the wet season.

DATA FORM  
 ROUTINE WETLAND DETERMINATION  
 (1987 COE Wetlands Delineation Manual)

Project/Site: <u>Sutter Power Plant</u> Applicant/Owner: <u>Onpine Corporation</u> Investigator: <u>D. Crowe, J. Glazner</u>	Date: <u>4/22/97</u> County: <u>Sutter</u> State: <u>California</u>
Do Normal Circumstances exist on the site? <span style="float: right;"><input checked="" type="radio"/> Yes <input type="radio"/> No</span> Is the site significantly disturbed (Atypical Situation)? <span style="float: right;"><input type="radio"/> Yes <input checked="" type="radio"/> No</span> Is the area a potential Problem Area? <span style="float: right;"><input checked="" type="radio"/> Yes <input type="radio"/> No</span> (If needed, explain on reverse.)	Community ID: <u>annual grassland</u> Transect ID: <u>Pool 4</u> Plot ID: <u>Plot 13</u> <i>Former mosquito abatement pond for raising Gambrusia</i> <i>Former rice field</i>

VEGETATION

Dominant Plant Species	% cover	Stratum	Indicator	Dominant Plant Species	Stratum	Indicator
1. <u>Aster subulatus</u>	<u>20</u>	<u>20</u>	<u>FACW</u>	9. _____	_____	_____
2. <u>Typha sp.</u>	<u>30</u>	<u>30</u>	<u>OBL</u>	10. _____	_____	_____
3. <u>Populus fremontii</u>	<u>15</u>	<u>15</u>	<u>X</u>	11. _____	_____	_____
4. <u>Salix goodingii</u>	<u>15</u>	<u>15</u>	<u>X</u>	12. _____	_____	_____
5. <u>Crypsis schomoides</u>	<u>30</u>	<u>30</u>	<u>OBL</u>	13. _____	_____	_____
6. <u>Rumex crispus</u>	<u>10</u>	<u>10</u>	<u>X</u>	14. _____	_____	_____
7. _____	_____	_____	_____	15. _____	_____	_____
8. _____	_____	_____	_____	16. _____	_____	_____

0.11 acre

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-I): 3/3 = 100%

Remarks: These plant species are limited to the interior of the excavated pool.

HYDROLOGY

<input checked="" type="checkbox"/> Recorded Date (Describe in Remarks): ___ Stream, Lake, or Tide Gauge ___ Aerial Photographs <input checked="" type="checkbox"/> Other <u>1996-97 wet season surveys</u> ___ No Recorded Data Available	Wetland Hydrology Indicators: Primary Indicators: <input checked="" type="checkbox"/> Inundated <input checked="" type="checkbox"/> Saturated in Upper 12 Inches ___ Water Marks ___ Drift Lines ___ Sediment Deposits ___ Drainage Patterns in Wetlands Secondary Indicators (2 or more required): ___ Oxidized Root Channels in Upper 12 Inches ___ Water-Stained Leaves ___ Local Soil Survey Data ___ FAC-Neutral Test ___ Other (Explain in Remarks)
Field Observations: Depth of Surface Water: <u>wet season</u> <u>55cm</u> Depth to Free Water in Pit: <u>&gt; 4/97</u> <u>&gt; 12"</u> (in.) Depth to Saturated Soil: <u>&gt; 12"</u> (in.)	

Remarks: The excavated area ponds water > 60 days during the wet season. Very few Sclerella occidentalis were observed in this pool.

SOILS

Map Unit Name (Series and Phase): Tisdale clay loam Drainage Class: well drained  
 Field Observations: 20% inclusions  
 Confirm Mapped Type? Yes No

Taxonomy (Subgroup): \_\_\_\_\_

Profile Description:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-5"		10YR 3/2	-	-	loamy clay
5-12"		10YR 4/2	-	-	clay w/ concretions

Hydric Soil Indicators:

- Histosol
- Histic Epipedon
- Sulfidic Odor
- Aquic Moisture Regime
- Reducing Conditions
- Gleyed or Low-Chrome Colors
- Concretions
- High Organic Content in Surface Layer in Sandy Soils
- Organic Streaking in Sandy Soils
- Listed on Local Hydric Soils List
- Listed on National Hydric Soils List
- Other (Explain in Remarks)

Remarks: The soil was farmed in rice since 1800s. The pool was excavated in 1987 for use as a mosquito abatement pond to raise fish.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="radio"/> Yes No (Circle)	Is this Sampling Point Within a Wetland? <input checked="" type="radio"/> Yes No (Circle)
Wetland Hydrology Present? <input checked="" type="radio"/> Yes No	
Hydric Soils Present? <input checked="" type="radio"/> Yes No	

Remarks: The man-made mosquito abatement trenches show <sup>all 3</sup> indicators of wetland characteristics. Hydrology only occurs seasonally during the winter wet seasons.

## APPENDIX C: WETLAND DELINEATION DATA SHEETS

**APPENDIX D: PLANT SPECIES LIST FOR SUTTER POWER  
PLANT PROJECT BY BOTANIST JEFF GLAZNER.**

Plant Species List for Calpine  
Corporation's Sutter Power Plant  
Project area.

Developed by Botanist Jeff  
Glazner, April 3, 8, 15, 22, 1997.

77-acre	Sutter Bypass	Utility Corridors	Scientific Name	Common name
v			<i>Abutilon theophrasti</i>	velvet-leaf *
	v	v	<i>Acer negundo</i> var. <i>californicum</i>	box-elder
v			<i>Achyrachaena mollis</i>	blow-wives
		v	<i>Ailanthus altissima</i>	tree-of-heaven *
v			<i>Alopecurus carolinianus</i>	tufted foxtail
	v		<i>Ambrosia psilostachya</i>	western ragweed
v			<i>Amsinckia menziesii</i> var. <i>intermedia</i>	fiddleneck
v		v	<i>Anagallis arvensis</i>	scarlet pimpernel *
v		v	<i>Anthemis cotula</i>	dog-fennel *
v	v	v	<i>Artemisia douglasiana</i>	mugwort
		v	<i>Arundo donax</i>	giant reed-grass *
v	v	v	<i>Aster subulatus</i> var. <i>ligulatus</i>	annual water-aster
		v	<i>Atriplex patula</i>	spear oracle
v	v	v	<i>Avena barbata</i>	slender oat *
v		v	<i>Avena fatua</i>	wild oat *
	v		<i>Bidens frondosa</i>	sticktight
v			<i>Brassica rapa</i>	rape mustard *
v		v	<i>Bromus catharticus</i>	rescue grass *
v		v	<i>Bromus diandrus</i>	ripgut brome *
v		v	<i>Bromus hordeaceus</i>	soft brome *
v			<i>Bromus madritensis</i> ssp. <i>rubens</i>	red brome *
v			<i>Calandrinia ciliata</i>	red maids
v			<i>Callitriche marginata</i>	winged water-starwort
			<i>Calocedrus decurrens</i>	incense cedar
v		v	<i>Capsella bursa-pastoris</i>	shepherd's purse *
v			<i>Cardamine oligosperma</i>	Idaho bittercress
v			<i>Carduus pycnocephalus</i>	Italian plumeless thistle *
	v	v	<i>Carex barbarae</i>	valley sedge
	v	v	<i>Carex praegracilis</i>	clustered field sedge
v	v	v	<i>Centaurea solstitialis</i>	yellow star-thistle *

	v		<i>Cephalanthus occidentalis</i> var. <i>californicus</i>	California button-willow
v	v	v	<i>Chamomilla suaveolens</i>	pineapple weed *
v	v	v	<i>Chenopodium album</i>	white goosefoot *
v			<i>Cichorium intybus</i>	chicory *
		v	<i>Cirsium vulgare</i>	bull thistle *
v	v	v	<i>Convolvulus arvensis</i>	field bindweed *
v			<i>Conyza bonariensis</i>	South American horseweed *
v			<i>Crassula aquatica</i>	aquatic pygmy-weed
v			<i>Crypsis schoenoides</i>	swamp grass *
			<i>Cupressus</i> sp.	Juniper
	v		<i>Cuscuta</i> sp.	dodder
v	v	v	<i>Cynodon dactylon</i>	bermuda grass *
v	v	v	<i>Cyperus eragrostis</i>	tall flatsedge
		v	<i>Datura stramonium</i>	Jimson weed *
	v		<i>Distichlis spicata</i>	inland saltgrass
v			<i>Elaeagnus angustifolius</i>	Russian olive *
v			<i>Elatine</i> sp.	waterwort
	v		<i>Eleocharis macrostachya</i>	common spikerush
	v		<i>Elytrigia intermedia</i> ssp. <i>intermedia</i>	intermediate wheatgrass *
v	v	v	<i>Epilobium brachycarpum</i>	autumn willowweed
v			<i>Epilobium ciliatum</i>	hairy willowherb
v			<i>Epilobium pygmaeum</i>	smooth boisduvalia
	v	v	<i>Erodium cicutarium</i>	redstem stork's bill *
	v		<i>Eschscholzia californica</i>	California poppy
	v		<i>Euthamia occidentalis</i>	western goldenrod
		v	<i>Festuca arundinacea</i>	tall fescue *
	v		<i>Frankenia salina</i>	alkali heath
	v		<i>Fraxinus latifolia</i>	Oregon ash
v		v	<i>Geranium dissectum</i>	cutleaf geranium *
v			<i>Geranium molle</i>	dovefoot geranium *
v			<i>Glyceria occidentalis</i>	western mannagrass
v			<i>Gnaphalium luteo-album</i>	everlasting cudweed *
	v		<i>Gnaphalium palustre</i>	western marsh cudweed
	v		<i>Hemizonia</i> sp.	tarweed
	v		<i>Hibiscus lasiocarpus</i>	rose-mallow
v			<i>Hordeum marinum</i> ssp. <i>gussoneanum</i>	Mediterranean barley *
v		v	<i>Hordeum murinum</i> ssp. <i>leporinum</i>	foxtail barley *

		v	<i>Juglans californica</i> var. <i>hindsii</i>	No. Calif. black walnut
	v	v	<i>Juncus balticus</i>	Baltic rush
v			<i>Juncus bufonius</i>	toad rush
v	v	v	<i>Lactuca serriola</i>	prickly lettuce *
	v		<i>Lasthenia glabrata</i>	yellow-rayed goldfields
v			<i>Leontodon taraxacoides</i>	hawkbit *
v	v	v	<i>Lepidium latifolium</i>	broadleaved pepper-grass *
	v	v	<i>Leymus triticoides</i>	beardless wildrye
v			<i>Lolium multiflorum</i>	Italian ryegrass *
v		v	<i>Lotus corniculatus</i>	birdfoot trefoil *
	v	v	<i>Lotus purshianus</i> var. <i>purshianus</i>	Spanish clover
		v	<i>Ludwigia peploides</i>	floating water-primrose
v			<i>Lupinus bicolor</i>	little lupine
v	v		<i>Lythrum hyssopifolium</i>	loosestrife *
	v		<i>Maclura pomifera</i>	osage-orange *
		v	<i>Malva parviflora</i>	cheeseweed *
v	v	v	<i>Marrubium vulgare</i>	horehound *
v	v	v	<i>Medicago polymorpha</i>	burclover *
v	v	v	<i>Medicago sativa</i>	alfalfa *
v	v	v	<i>Melilotus albus</i>	white sweetclover *
v			<i>Melilotus indicus</i>	sourclover *
	v		<i>Navarretia leucocephala</i>	white-headed navarretia
v	v	v	<i>Paspalum dilatatum</i>	dallis grass *
		v	<i>Phalaris aquatica</i>	Harding grass *
v	v	v	<i>Phalaris minor</i>	littleseed canary-grass *
v			<i>Phalaris paradoxa</i>	hooded canary-grass *
	v		<i>Phoradendron macrophyllum</i>	big leaf mistletoe
	v	v	<i>Phyla nodiflora</i>	turkey tangle fogfruit
v			<i>Picris echioides</i>	bristly ox-tongue *
v			<i>Pilularia americana</i>	pillwort
			<i>Pinus radiata</i>	Monterey pine
v	v		<i>Plagiobothrys stipitatus</i> var. <i>micranthus</i>	little valley plagiobothrys
	v		<i>Plagiobothrys stipitatus</i> var. <i>stipitatus</i>	big valley plagiobothrys
		v	<i>Plantago lanceolata</i>	narrowleaf plantain *
	v		<i>Plantago major</i>	big plantain *
v		v	<i>Poa annua</i>	annual bluegrass *



	v	v	<i>Polygonum amphibium</i> var. <i>emersum</i>	kelp
v	v	v	<i>Polygonum arenastrum</i>	common knotweed *
		v	<i>Polygonum hydropiperoides</i>	waterpepper
v	v	v	<i>Polygonum persicaria</i>	lady's thumb *
		v	<i>Polygonum punctatum</i>	punctate smartweed
		v	<i>Polypogon monspeliensis</i>	annual beard-grass *
v	v	v	<i>Populus fremontii</i> ssp. <i>fremontii</i>	Fremont's cottonwood
	v		<i>Psilocarphus brevissimus</i>	woolly marbles
	v		<i>Psilocarphus oregonus</i>	Oregon woolly marbles
	v	v	<i>Quercus lobata</i>	Valley oak
v		v	<i>Ranunculus muricatus</i>	spiny buttercup *
		v	<i>Raphanus raphanistrum</i>	wild radish *
v		v	<i>Raphanus sativus</i>	wild radish *
		v	<i>Robinia pseudoacacia</i>	black locust *
	v		<i>Rorippa curvisiliqua</i>	curvepod yellow-cress
	v		<i>Rosa californica</i>	California wildrose
v	v	v	<i>Rubus discolor</i>	Himalaya-berry *
v	v	v	<i>Rumex crispus</i>	curly dock *
v		v	<i>Salix exigua</i>	sandbar willow
v	v	v	<i>Salix gooddingii</i>	Goodding's black willow
v	v		<i>Salix lasiolepis</i>	arroyo willow
v	v	v	<i>Scirpus acutus</i> var. <i>occidentalis</i>	hardstem bulrush
	v		<i>Scirpus fluviatilis</i>	river bulrush
	v		<i>Scirpus robustus</i>	alkali bulrush
v	v	v	<i>Senecio vulgaris</i>	common groundsel *
v	v	v	<i>Sinapis arvensis</i>	charlock *
		v	<i>Solanum</i> sp.	
v	v	v	<i>Sonchus asper</i> ssp. <i>asper</i>	prickly sowthistle *
v		v	<i>Sorghum bicolor</i>	Sudan grass *
v		v	<i>Sorghum halepense</i>	johnsongrass *
	v		<i>Stellaria media</i>	common chickweed *
		v	<i>Tribulus terrestris</i>	puncture-vine *
v			<i>Trifolium repens</i>	white clover *
v	v	v	<i>Typha latifolia</i>	broadleaf cattail
	v		<i>Verbascum thapsus</i>	common mullein *
v		v	<i>Verbena litoralis</i>	seashore vervain *
v	v		<i>Veronica peregrina</i> ssp. <i>xalapensis</i>	hairy purslane speedwell
v	v	v	<i>Vicia benghalensis</i>	purple vetch *

		v	<i>Vinca major</i>	greater periwinkle *
	v	v	<i>Vitis californica</i>	California wild grape
v	v	v	<i>Vulpia myuros</i>	rattail fescue *
v	v		<i>Xanthium strumarium</i>	cocklebur

Location = left to right -- 77-acre parcel, Sutter Bypass, Utility  
Corridors

v

Present

\* Non-native plant species