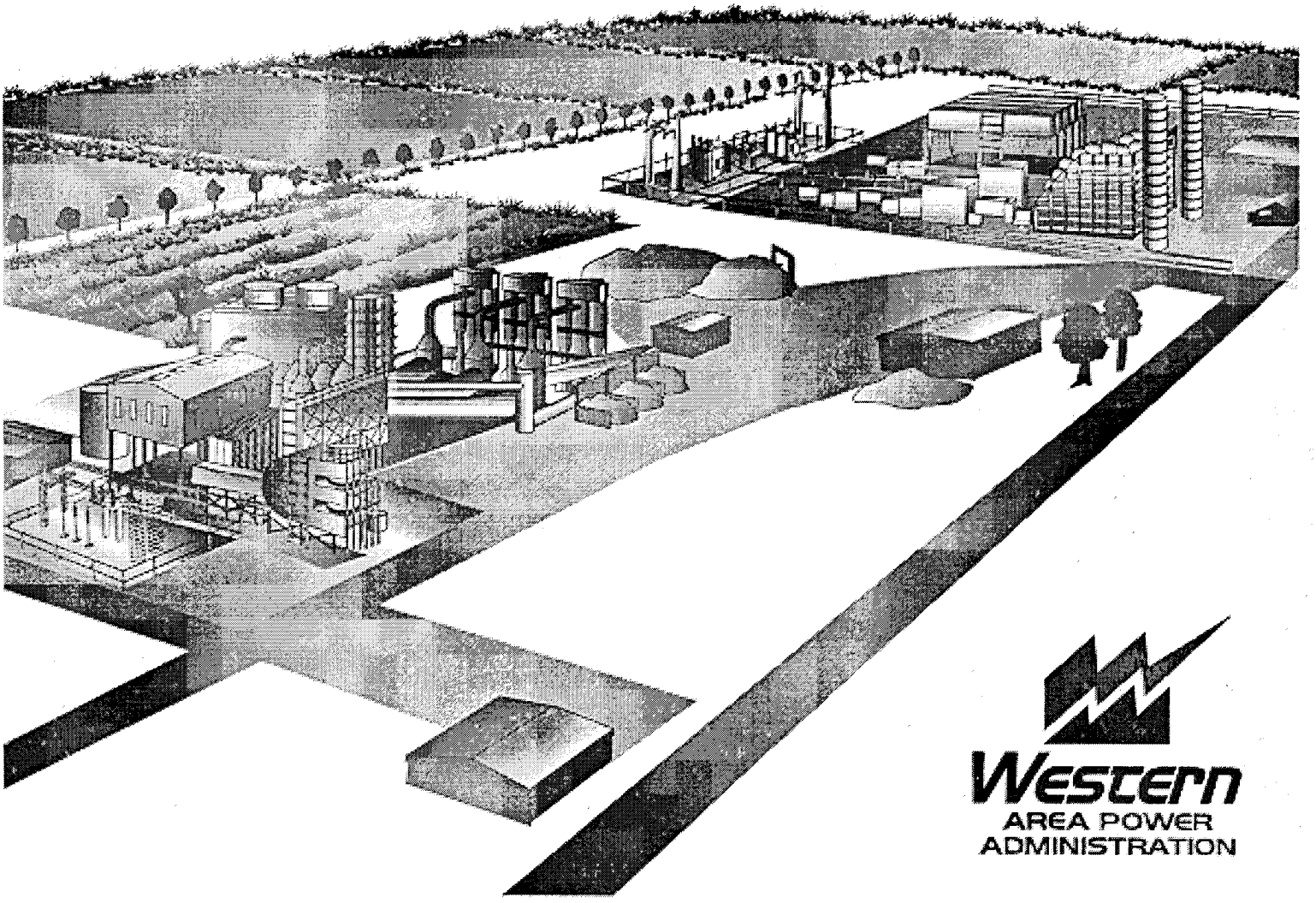
Sutter Power Project

Final Environmental Impact Statement
Volume 2 Appendices

DOE/EIS 0294



Western
AREA POWER
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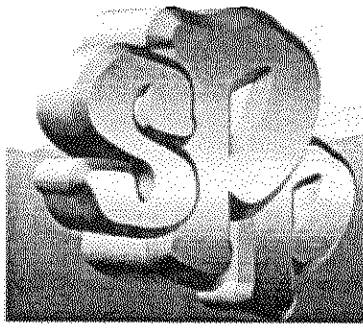
Sierra Nevada Customer Service Region

Western Area Power Administration
U.S. Department of Energy

APRIL 1999



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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 Fillng 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, 19/98.[1]

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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[1] 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

FW50 Calpine/SPP-VP-PM1-003 CROWE

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

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

REPLY TO
ATTENTION OF

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,

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

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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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

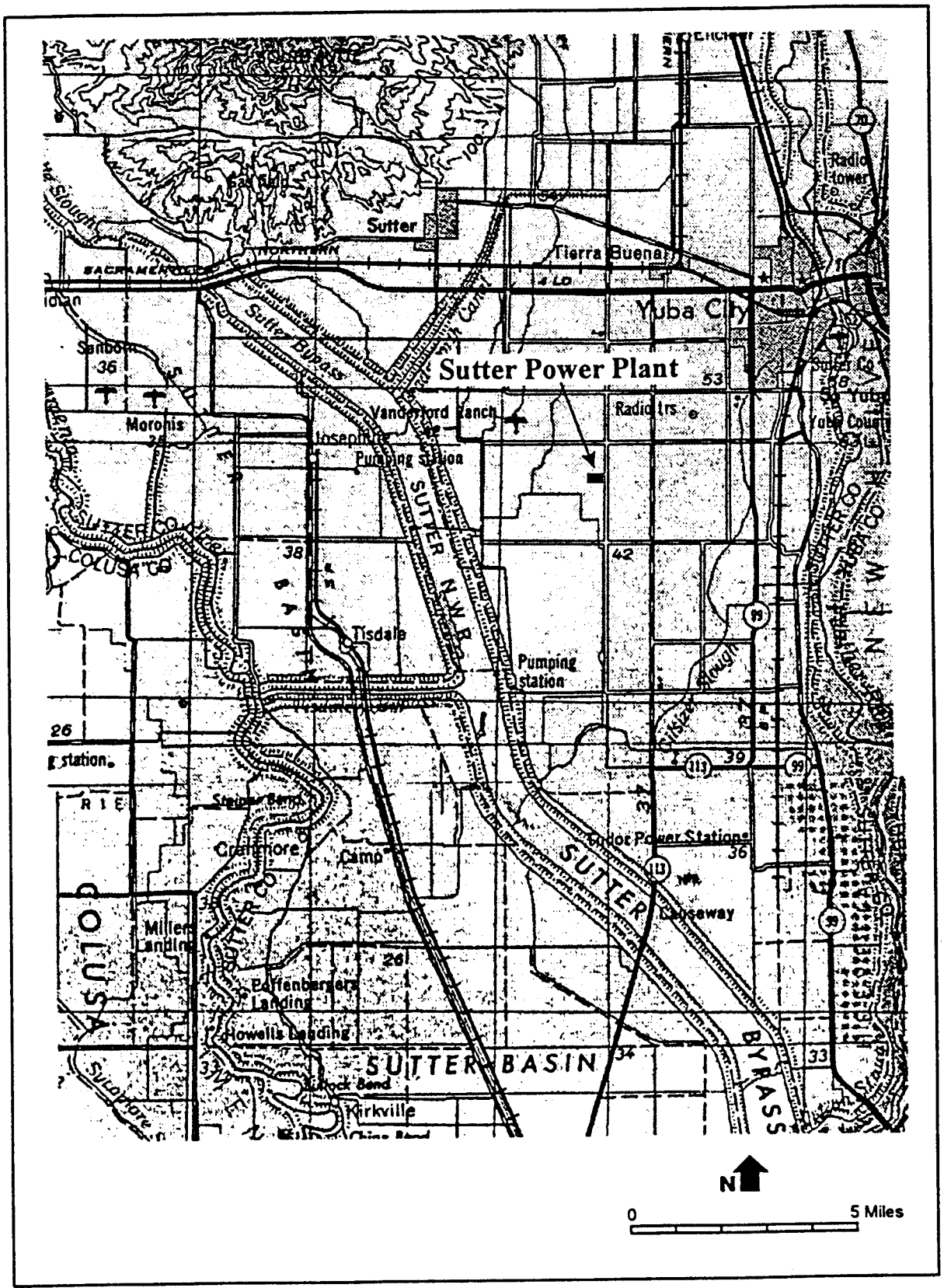

Figure 1. Location map for Calpine Corporation's Sutter Power Plant Project, Yuba City, California.

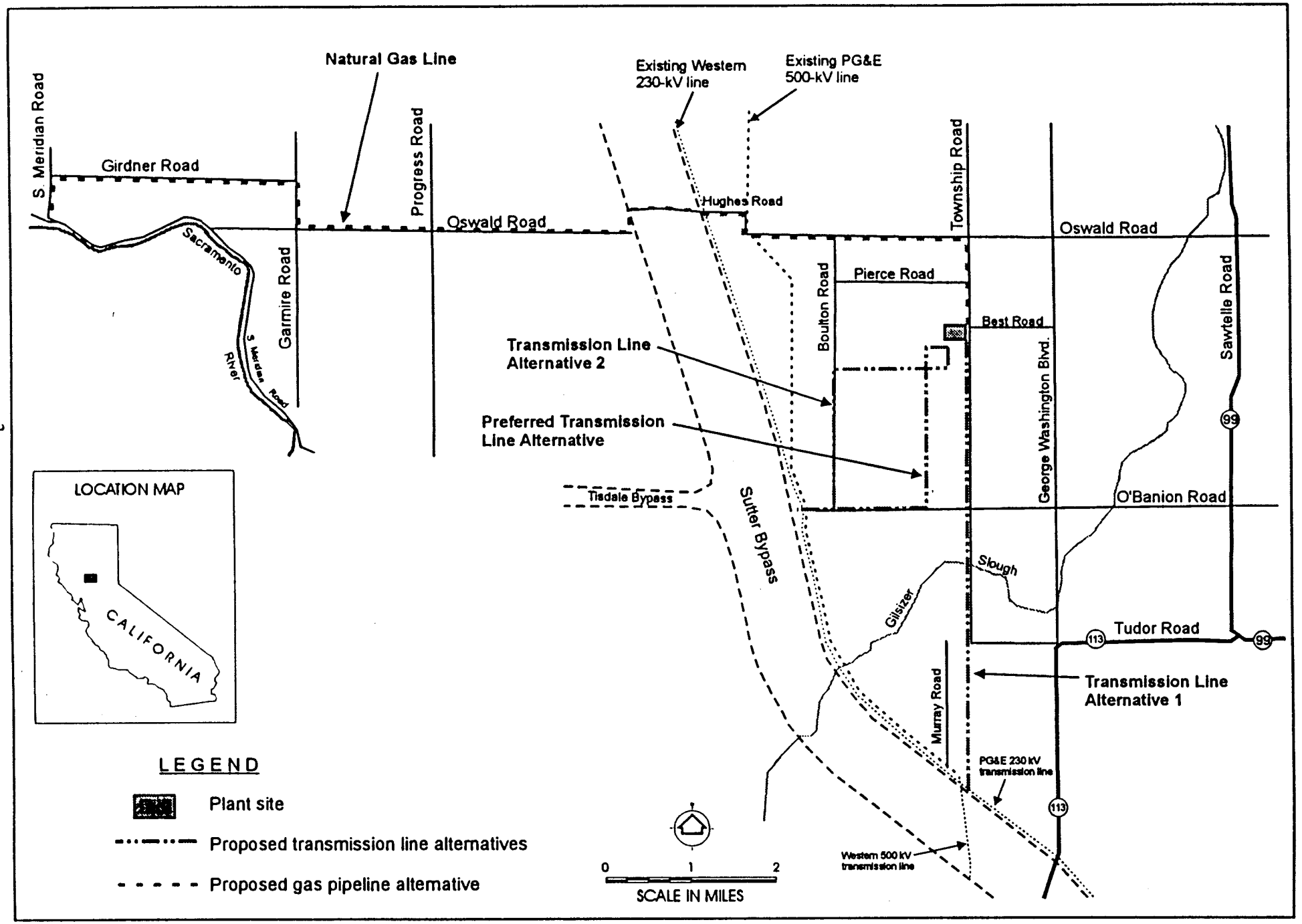

Figure 2. Sutter Power Plant project features.

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

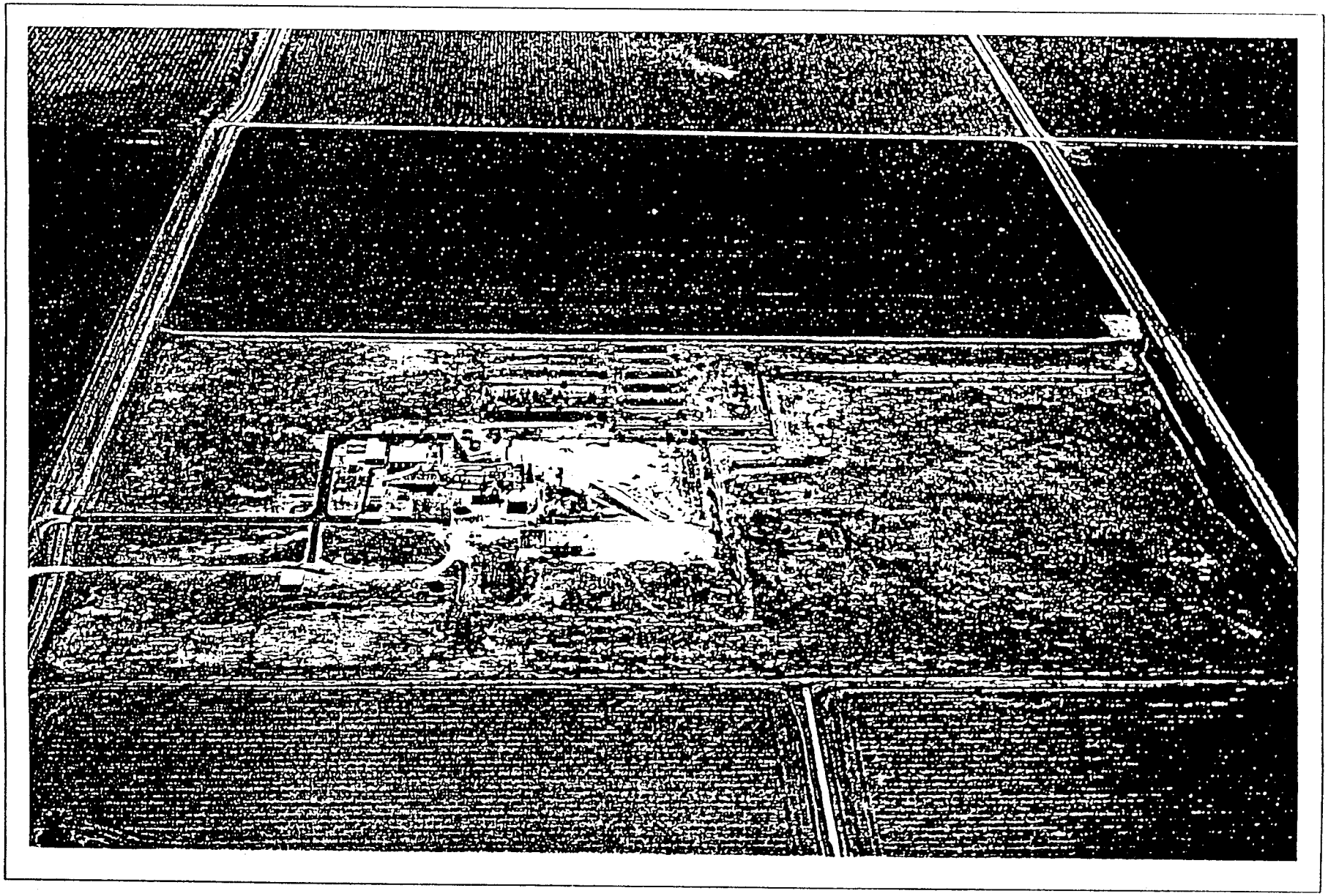

Figure 3. Calpine Corporation's Sutter Power Plant Project Site showing Greenleaf 1 facilities, surrounding land use, agricultural ditches, and man-made wetlands in disturbed annual grassland, April 14, 1997.

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 (NWPs) 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 planimetering 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: *Typha* sp., *Callitriche marginata*
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: *Alopecurus carolinianus, Rumex crispus*
Facultative Plants (FAC)	Plants with a similar likelihood (estimated probability 33% to 67%) of occurring in both wetlands and nonwetlands. Example: *Lepidium densiflorum*
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: *Sorghum halepense*
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: *Brassica nigra, Avena fatua, Medicago polymorpha*

* 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 forbe species including, wild radish (*Raphanus sativus*), wild oats (*Avena fatua*), Italian ryegrass (*Lolium multiflorum*), and star thistle (*Centaurea solsititialis*). 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)
Transistional vernal pools						
SPP-15	0.17	20	9	60	>84	Hydric[a]
SPP-16	0.03	15	6	100	>42	Hydric[a]
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	--
Total acres	**0.424**					
Borrow pits						
SPP-31[c]	0.52	50	10	100	>70	Hydric[a, b]
SPP-29	0.03	25	--	50-100	>70	--
SPP-32[c]	0.30	75	--	50-100	>120	--
SPP-36[c]	0.27	55	--	50-100	>84	--
Total acres	**1.12**					
Mosquito abatement trenches						
SPP-4[c]	0.11	55	13	100	>80	Hydric[a, b]
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[c]	0.27	46	--	50-100	>56	--
SPP-13	0.19	23	--	50-100	>42	--
Total acres	**1.76**					

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)
Perennial mosquito abatement pond						
SPP-14[d]	0.27	>120	--	--	year-round	--
Total acres	**0.27**					
Seasonal depressions						
SPP-1	0.26	19	12	50	>42	Hydric[a]
SPP-24	0.13	14	8	60	>42	Hydric[a]
SPP-27	0.01	24	--	50-100	>42	--
SPP-33[c]	4.19	21	1, 2, 3	100, 80, 75	>56	Hydric[a, b]
SPP-34[c]	0.24	10	--	50-100	>42	--
SPP-35	0.27	12	--	50-100	>42	--
Total acres	**5.10**					
Total man-made wetland acres	**3.16**					
Total developing wetland acres	**5.51**					
Grand total acres	**8.67**					

30 wetlands

* Only soil from the representative locations were analyzed

[a] Low chroma

[b] Concretions

[c] Location of *Linderiella occidentalis*

[d] 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 packardi*) 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 gasline utility corridor within the Sutter Bypass (CNDDB 1997, Glazner 1997).

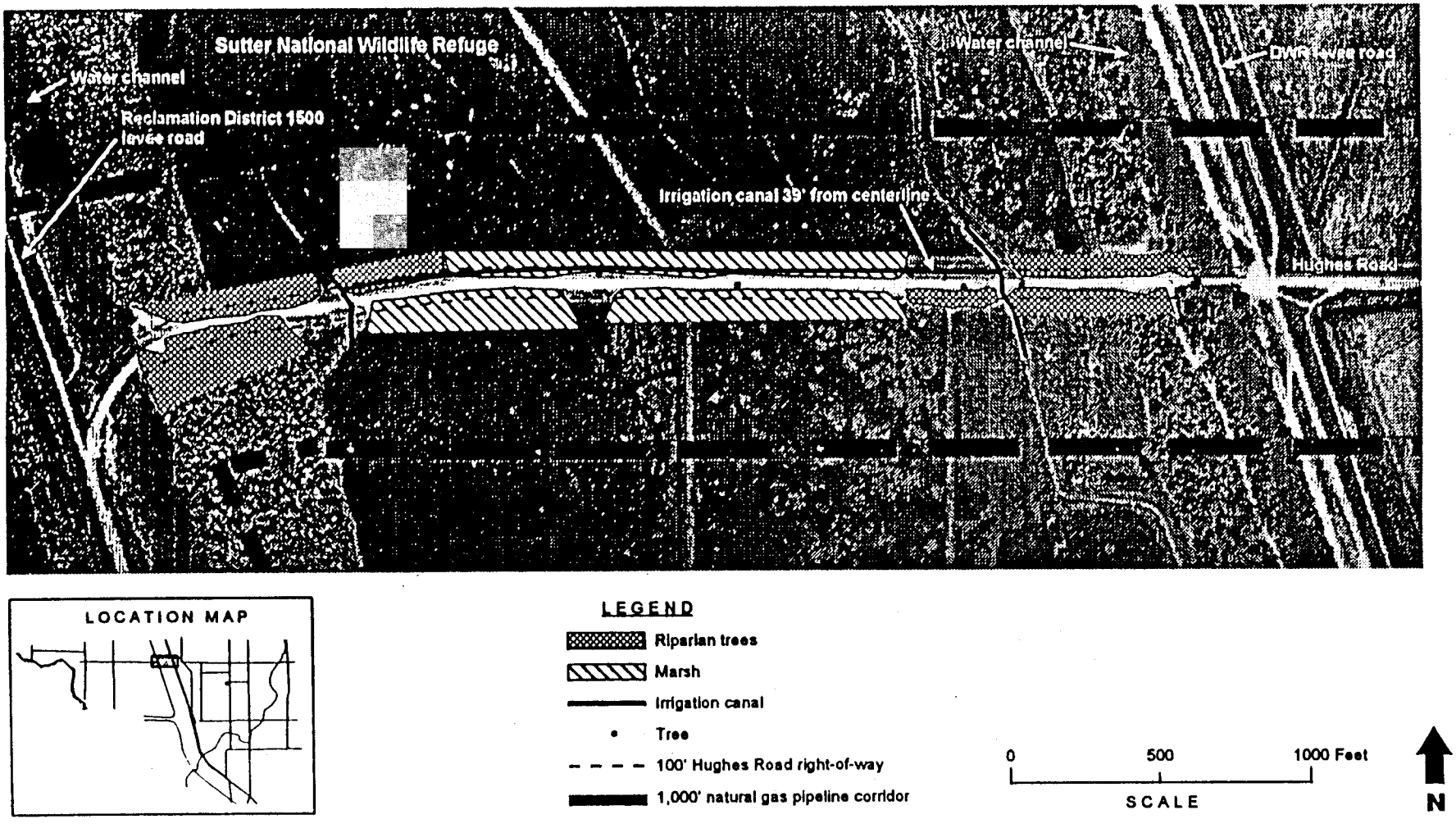

Figure 4. Wetlands and riparian habitat extending from Sutter National Wildlife Refuge into the Hughes Road right-of-way and construction area, Spring 1997.

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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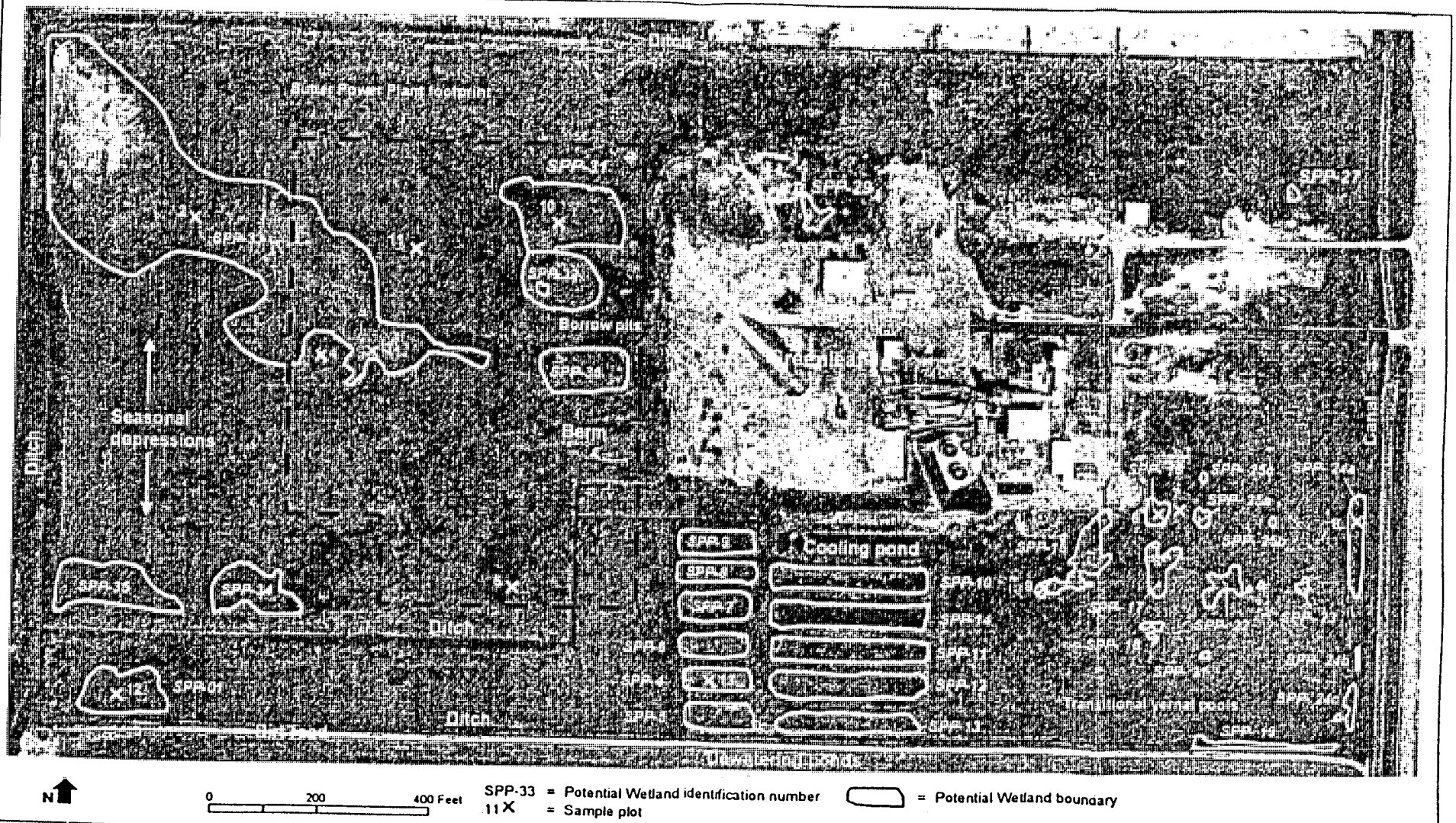
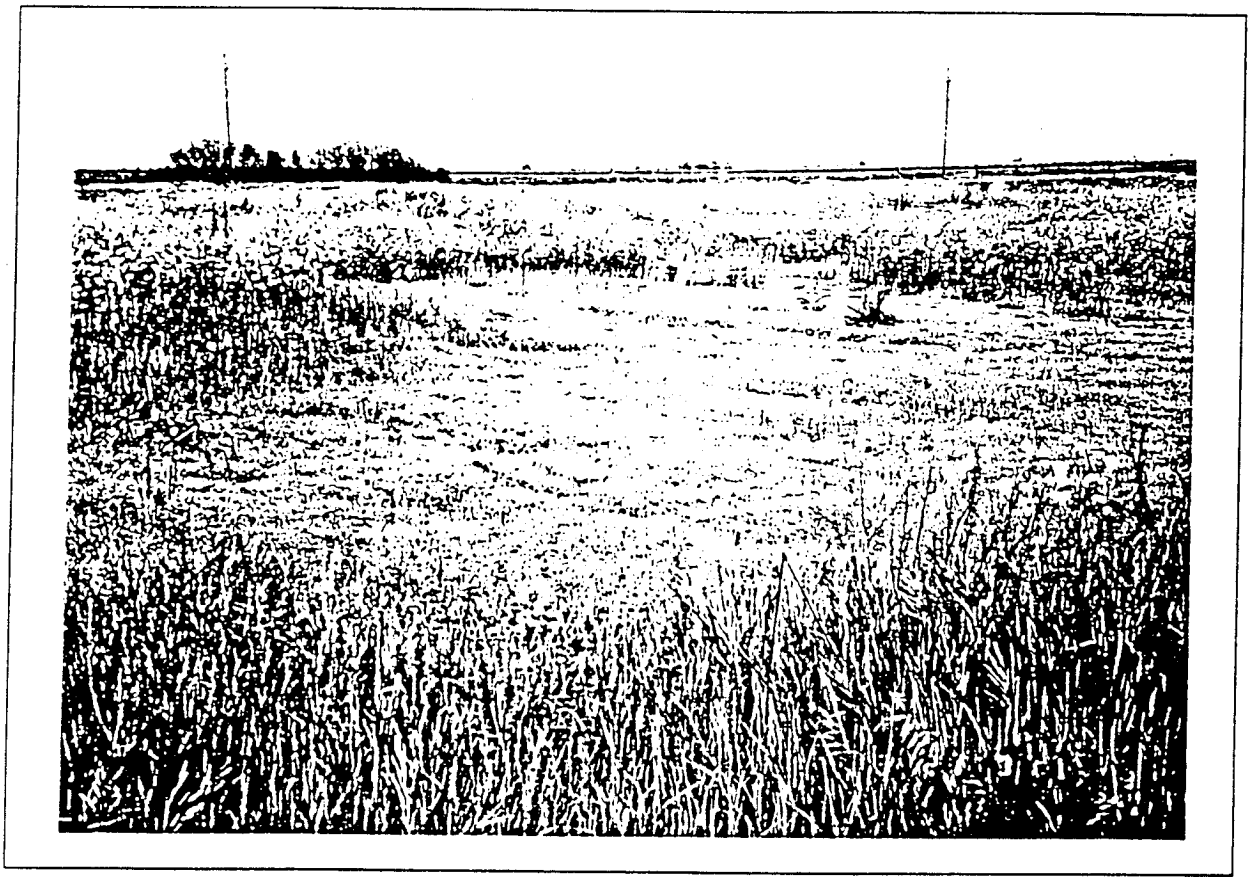
APPENDIX A: PRELIMINARY WETLAND DELINEATION MAP



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

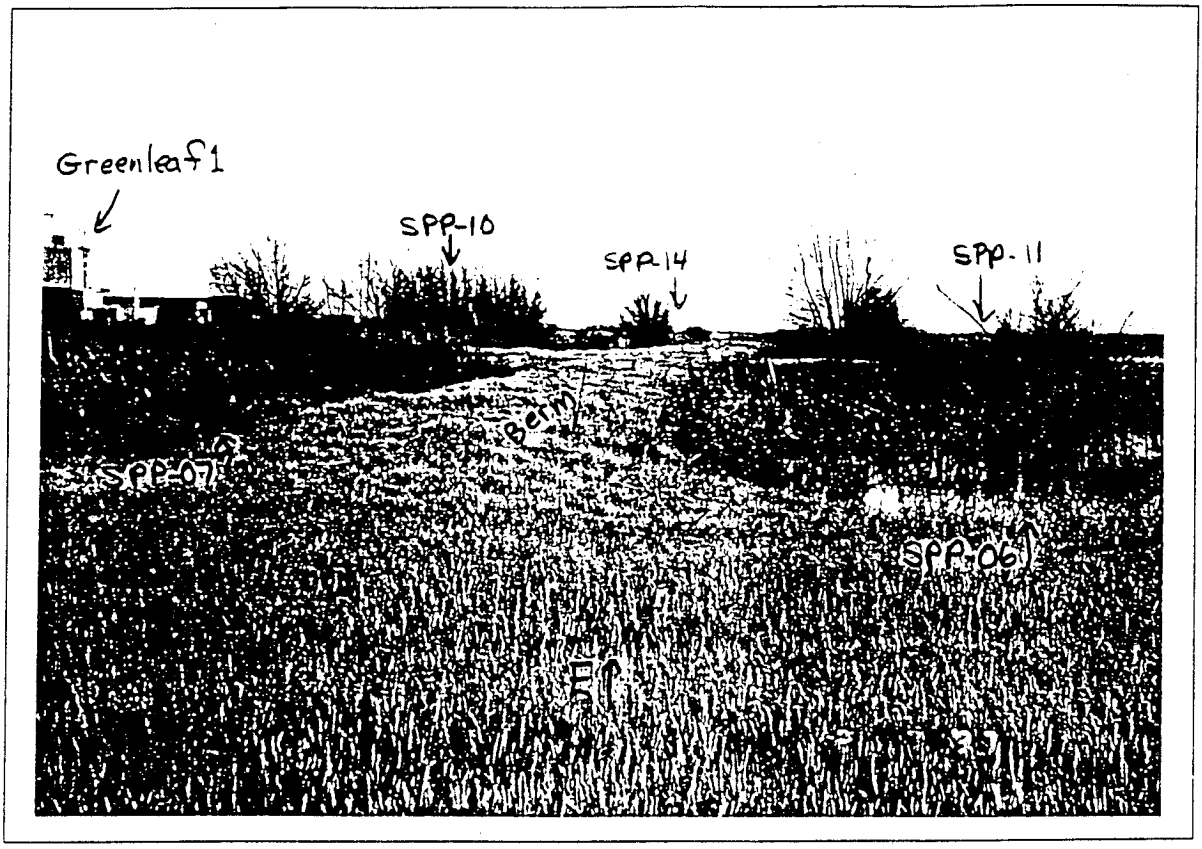


Appendix B-1. Transitional vernal pool (SPP-16) in southeast corner of Sutter Power Plant project site showing popcorn flower (*Plagiobothrys stipitatus* var. *micranthus*) and boundary of yellow mustard in upland areas, March 31, 1997.

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 (*Linderiella occidentalis*) found in borrow pit SPP-31, January 24, 1997



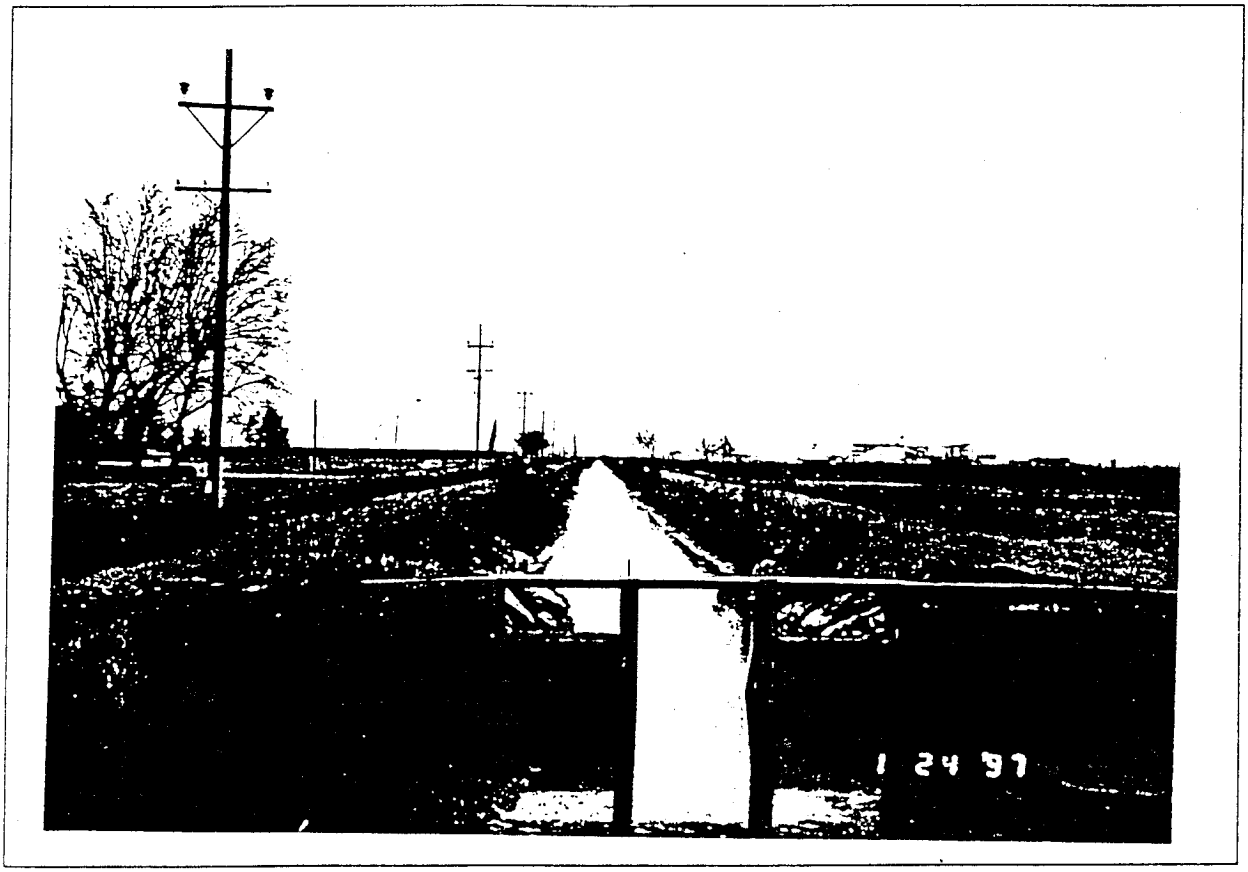
Appendix B-5. Abandoned mosquito abatement trenches south of Greenleaf 1 showing ponding and dormant willows (*Salix* sp.), cottonwoods (*Populus fremontii*), and cattails (*Typha latifolia*), February 7, 1997.

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

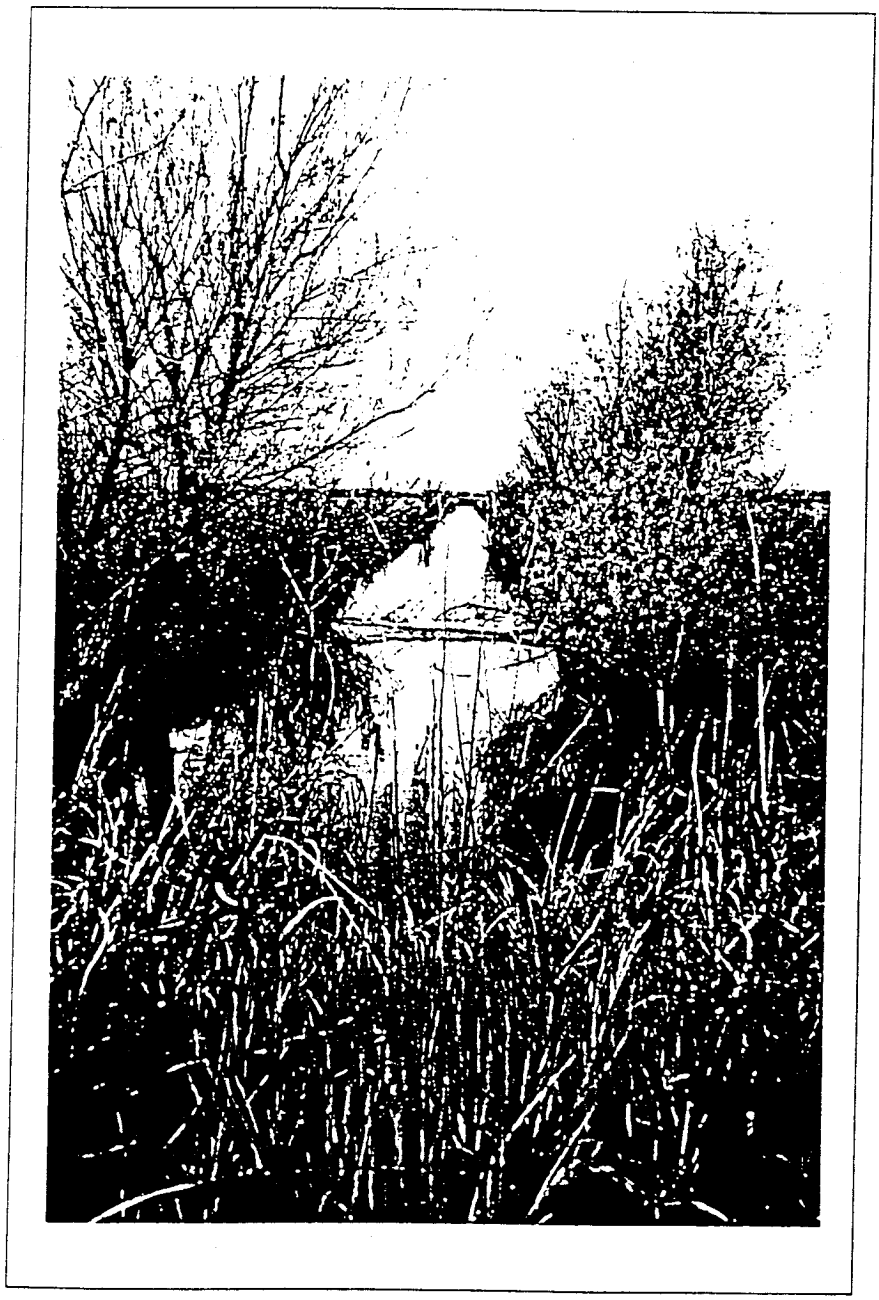
Appendix B-7. Seasonal ponded depression (SPP-33) during wet season showing ponding and Sutter Buttes in background, January 24, 1997.

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

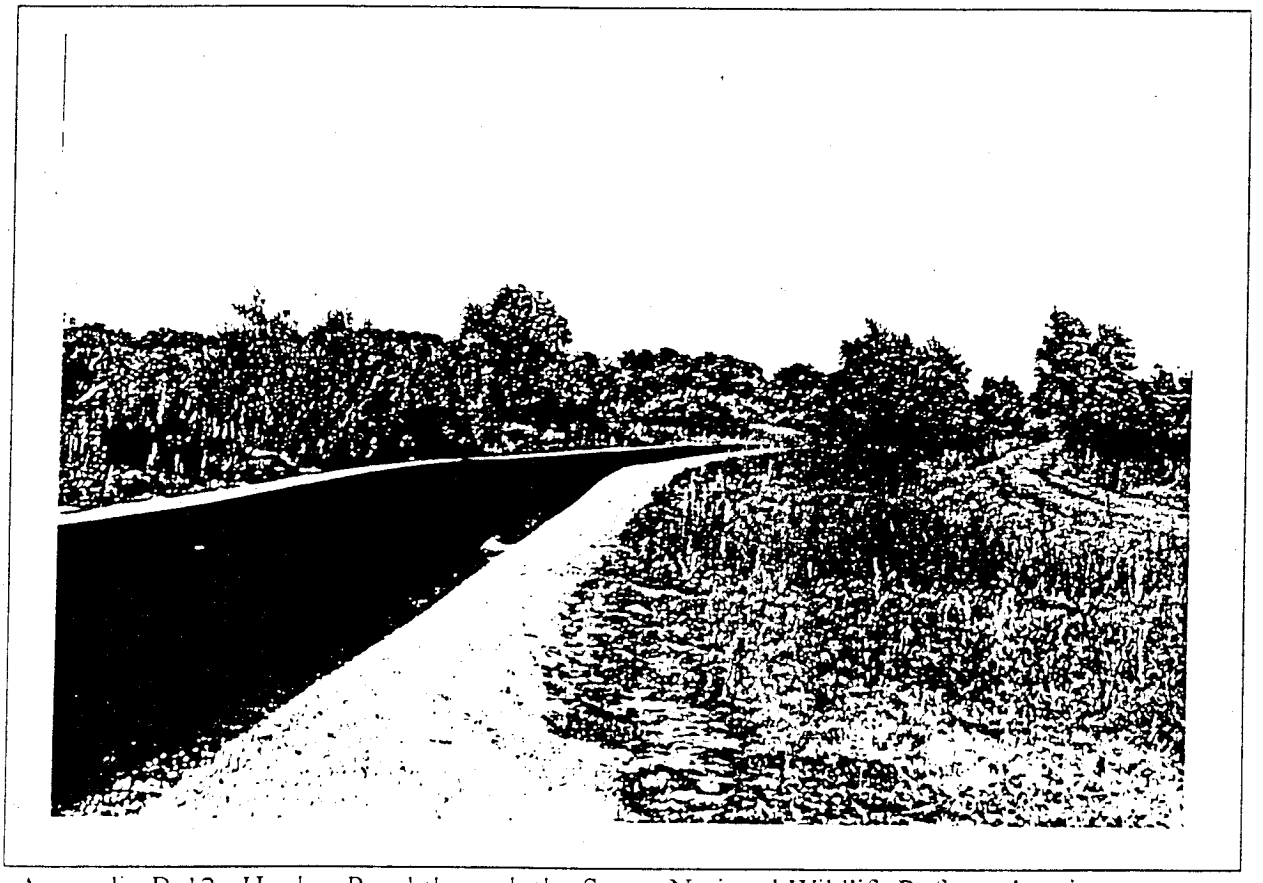
Appendix B-9.
Agricultural ditch on the north boundary showing annual burn effects by rice farmers, March 31, 1997.



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: Sutter Power Plant
Applicant/Owner: Calpine Corp
Investigator: D. Crowe, J. Glazner

Date: 4/3/97
County: Sutter
State: CA

Do Normal Circumstances exist on the site? (Yes) No
Is the site significantly disturbed (Atypical Situation)? Yes (No)
Is the area a potential Problem Area? (Yes) No
(If needed, explain on reverse.)

Community ID: ~~Fallow farm~~ Rice fields annual grass + forbes
Transect ID: Pad 33
Plot ID: 01
NW portion of site
4.19 acres

VEGETATION

Dominant Plant Species	% cover ~~Stratum~~	Indicator
1. Rumex crispus	50	~~FACW~~
2. bare cracked ground	50	-
3.		
4.		
5.		
6.		
7.		
8.		

~~Dominant~~ Other Plant Species	Stratum	Indicator
9. Lythrum hysopifolium	10	
10. Cyperus sp.	10	
11. Geranium dissectum	T	
12. Wetland seedlings (unk)	T	
13. Convovulus arvensis	5	
14. Veronica peregrinus	T	
15. Castilleja obligosperma	T	
16.		

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

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

HYDROLOGY

✓ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
✓ Other
___ No Recorded Data Available

Field Observations:
Depth of Surface Water: in wet season 21 cm ~~(in.)~~
Depth to Free Water in Pit: 4/97 > 16" (in.)
Depth to Saturated Soil: 4/97 > 16" (in.)

Wetland Hydrology Indicators:
Primary Indicators:
✓ Inundated
✓ 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)

Remarks: Saturation/Ponding for the area was recorded during 1996-97 vernal pool Austrocean 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): Cridley 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:

- ___ Histosol
- ___ 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 disked 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? (Circle) (Yes) No

Remarks: This area seasonally ponds water during the wet season. It is disked 3 times a year. It was farmed in rice since 1800's, has been fallow for 5 10yrs. Lindersella occidentalis were observed here during 1996-97 wet season. Possible Oswald inclusion area.

Approved by HQUSACE 3/92

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

Project/Site: Sutter Power Plant
Applicant/Owner: Calpine Corp.
Investigator: D. Crowe, J. Glazner

Date: 4/3/97
County: Sutter
State: California

Do Normal Circumstances exist on the site? (Yes) No
Is the site significantly disturbed (Atypical Situation)? Yes (No)
Is the area a potential Problem Area? (Yes) No
(If needed, explain on reverse.)

Community ID: Annual grass/forbes fallow rice field
Transect ID: Pool 33
Plot ID: 02

VEGETATION

Dominant Plant Species	% cover (Stratum)	Indicator
1. Convolvulus arvensis	30	UPL
2. Cardamine oligosperma	30	FACW
3. Veronica peregrinas	30	OBL
4. Callitriche marginata	30	OBL
5. Alopecurus carolinianus	30	FACW
6.		
7.		
8.		

Dominant Plant Species	Stratum	Indicator
9. Rumex crispus	10	FACW-
10. Phalaris s	tr	
11.		
12.		
13.		
14.		
15.		
16.		

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

Remarks: Soil disked annually for fire control

HYDROLOGY

✓ Recorded Data (Describe in Remarks):
__ Stream, Lake, or Tide Gauge
__ Aerial Photographs
✓ Other Ponding observed during wet season
__ No Recorded Data Available

Field Observations:
Depth of Surface Water: during wet season 21cm+
Depth to Free Water in Pit: >14 (in.)
Depth to Saturated Soil: 4/4/97 >14 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
✓ Inundated
✓ 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)

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

Plot 02

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.
0-6"		10YR 3/2	10YR 4/3	5%	clay loam
6-14"		10YR 3/1	—		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 disked 3 times a year, was farmed in rice >100 yrs

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)

Wetland Hydrology Present? (Yes) No

Hydric Soils Present? (Yes) No

(Circle)

Is this Sampling Point Within a Wetland? (Yes) No

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

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

Project/Site: Sutter Power Plant
Applicant/Owner: Calpine Corp
Investigator: D. Crowe, J. Glazner

Date: 4/3/97
County: Sutter
State: California

Do Normal Circumstances exist on the site? (Yes) No
Is the site significantly disturbed (Atypical Situation)? Yes (No)
Is the area a potential Problem Area? (Yes) No
(If needed, explain on reverse.)

Community ID: annual grass/forbes fallow mesofwis
Transect ID: Pool 33
Plot ID: Plot 03
at edge of pool 33

VEGETATION

Dominant Plant Species	% cover Stratum	Indicator	Dominant Plant Species	% cover Stratum	Indicator
1. Phalaris lemmonii	25	FACW-	9. Lythrum hyssopifolium	5	
2. Alopecurus carolinianus	40	FACW	10. Veronica peregrinus	5	
3. Poa Annua	60	FACW-	11. Ranunculus muricatus	10	
4. Convovulus arvense	20	UPL	12. Rumex Crispus	5	
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 noticably lower veg height - decreased amount of Rumex

HYDROLOGY

✓ Recorded Data (Describe in Remarks):
__ Stream, Lake, or Tide Gauge
__ Aerial Photographs
✓ Other Wet season survey for fairy shrimp
__ No Recorded Data Available

Field Observations:
Depth of Surface Water: in wet season 21cm ~~(in.)~~
Depth to Free Water in Pit: >10" (in.)
Depth to Saturated Soil: >10" (in.) 4/97

Wetland Hydrology Indicators:
Primary Indicators:
✓ Inundated
✓ 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)

Remarks: Saturation/ponding was recorded during the 1996-97 wet season for vernal pool crustacean surveys at 15-21cm Plot 3 is at the edge

Plot 03

SOILS

Map Unit Name (Series and Phase): Cridley 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.
0-4"		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:

- ___ 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 disked 3 times a year - was farmed in rice > 100 yrs

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 winter wet season. Linderidla occidentalis were observed during the 1996-97 wet season. The area is disked 3 times a year.

Approved by HQUSACE 3/92

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

Project/Site: Sutter Power Plant
Applicant/Owner: Calpine Corporation
Investigator: D. Crowe, J. Glazner

Date: 4/3/97
County: Sutter
State: California

Do Normal Circumstances exist on the site? (Yes) No
Is the site significantly disturbed (Atypical Situation)? Yes (No)
Is the area a potential Problem Area? (Yes) No
(If needed, explain on reverse.)

Community ID: annual grass/forbes
Transect ID: bot 33 upland
Plot ID: Plot 04
fallow rice field
Upland plot
(photo)

VEGETATION

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

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

Remarks: Avena most characteristic for the area

HYDROLOGY

✓ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
✓ Other wet season surveys for fairy shrimp
___ No Recorded Data Available

Field Observations:
Depth of Surface Water: 0 (in.)
Depth to Free Water in Pit: > 10" (in.)
Depth to Saturated Soil: > 10" (in.)

Wetland Hydrology Indicators:
Primary Indicators:
___ Inundated
___ 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)

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): Tisdale 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 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? (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 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 indicate a subtle transition zone between upland & wetland

Approved by HQUSACE 3/92

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

Project/Site: Sutter Power Plant
Applicant/Owner: Calpine Corporation
Investigator: D. Crouse, J. Glazner

Date: 4/3/97
County: Sutter
State: California

Do Normal Circumstances exist on the site? (Yes) No
Is the site significantly disturbed (Atypical Situation)? Yes (No)
Is the area a potential Problem Area? (Yes) No
(If needed, explain on reverse.)

Community ID: annual grassland
Transect ID: 300' N of Border SW of Greenleaf 400'
Plot ID: Plot 05
Upland
(photo)
fallow rice field

VEGETATION

Dominant Plant Species	% cover Stratum	Indicator	Other Dominant Plant Species	% cover Stratum	Indicator
1. Avena fatua	20	UPL	9. Medicago sp.	15	
2. Bromus diandrus	90	UPL	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

✓ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ✓ Other Wet season vernal pool shrimp surveys
- ___ No Recorded Data Available

Field Observations:
- Depth of Surface Water: 0 (in.)
- Depth to Free Water in Pit: >12" (in.)
- Depth to Saturated Soil: >12" (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- ___ Inundated
- ___ 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)

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

Plot 05 - upland

SOILS

Map Unit Name (Series and Phase): Tisdale 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.
0-4"		10YR 4/2	10YR 6/4	10%	sandy clay loam
4-16"		10YR 4/1	10YR 4/6	20%	clay loam

Hydric Soil Indicators:

- ___ 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? Yes (No) (Circle)
Wetland Hydrology Present? Yes (No)
Hydric Soils Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? Yes (No)

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.

Approved by HQUSACE 3/92

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

Project/Site: Sutter Power Plant
Applicant/Owner: Calpine Corporation
Investigator: D. Crowl, J. Blazner

Date: 4/3/97
County: Sutter
State: California

Do Normal Circumstances exist on the site? (Yes) No
Is the site significantly disturbed (Atypical Situation)? Yes (No)
Is the area a potential Problem Area? (Yes) No
(If needed, explain on reverse.)

Community ID: annual grassland fallow rice field
Transect ID: Pool 16
Plot ID: Plot 016
acres = 0.03

VEGETATION

Dominant Plant Species	% Cover ~~Stratum~~	Indicator	~~Other Dominant~~ Plant Species	% cover ~~Stratum~~	Indicator
1. Plagiobothrys stipitatus var. micranthus	99%	OBL	9. Lupinus bicolor	tr	
2.			10. Achyrachaena mollis	tr	
3. Cardamine oligosperma	25	FACW	11. Convolvulus	15	
4. Poa annua	90	FACW-	12. Phalaris	tr	
5. Alopecurus carolinianus	25	FACW	13. Lolium multiflorum	tr	
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

✓ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ✓ Other 1996-97 wet season vernal pool shrimp surveys
- ___ No Recorded Data Available

Field Observations:

Depth of Surface Water: wet season	15 cm	(in.)
Depth to Free Water in Pit: 4/97	> 12"	(in.)
Depth to Saturated Soil: 4/97	> 12"	(in.)

Wetland Hydrology Indicators:
Primary Indicators:
- ✓ Inundated
- ✓ 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)

Remarks: Ponding and saturation was observed and recorded during the 1996-97 vernal pool crustacean surveys (>43 days) at 15 cm and less. No vernal pool crustaceans observed.

Plot 06

SOILS

Map Unit Name (Series and Phase): Tindall 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:

- ___ 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: Unconsolidated, gravel in upper layer. Disked 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 seasonally ponded depression exhibits characteristics of wetland vegetation, hydrology & soils. It is disked annually but retains a visible definition between wetland & upland vegetation.

Approved by HQUSACE 3/92

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

Project/Site: Sutter Power Plant
Applicant/Owner: Calpine Corporation
Investigator: D. Crowe, J. Glazner

Date: 4/3/97
County: Sutter
State: California

Do Normal Circumstances exist on the site? (Yes) No
Is the site significantly disturbed (Atypical Situation)? Yes (No)
Is the area a potential Problem Area? (Yes) No
(If needed, explain on reverse.)

Community ID: Annual grassland - upland
Transect ID: E of Pole 16 fallow rice field
Plot ID: Plot 07

VEGETATION

Dominant Plant Species	% cover Stratum	Indicator	Other Plant Species	% cover Stratum	Indicator
1.			9. Avena fatua	5	
2. Bromus diandrus	60	UPL	10. Medicago	15	
3. Convolvulus arvense	40	UPL	11. Lolium multi	10	
4. Vulpia myuros	20	FACU	12. Rumex crispis	5	
5.			13. Sinapis arvensis	15	
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

(✓) Recorded Data (Describe in Remarks):
( ) Stream, Lake, or Tide Gauge
( ) Aerial Photographs
(✓) Other 1996-97 wet season surveys
( ) No Recorded Data Available

Field Observations:

Depth of Surface Water: 0 (in.)
Depth to Free Water in Pit: > 12 (in.)
Depth to Saturated Soil: > 12 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
( ) Inundated
( ) 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)

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

Plot 07 - upland

SOILS

Map Unit Name (Series and Phase): Tidale 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 3/3	-	-	loamy
6-12"		10YR 3/2	7.5 YR 4/6	15%	dense clay

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: 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 (No) (Circle)
Wetland Hydrology Present? Yes (No)
Hydric Soils Present? (Yes) No

Is this Sampling Point Within a Wetland? Yes (No) (Circle)

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

Approved by HQUSACE 3/92

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

Project/Site: Sutter Power Plant
Applicant/Owner: Calpine Corporation
Investigator: D. Crowe, J. Glazner

Date: 4/3/97
County: Sutter
State: California

Do Normal Circumstances exist on the site? (Yes) No
Is the site significantly disturbed (Atypical Situation)? Yes (No)
Is the area a potential Problem Area? (Yes) No
(If needed, explain on reverse.)

Community ID: annual grassland fallow rice field
Transect ID: Pool 24
Plot ID: Plot 08-10 (N) of willows
Low edge of field - ~~drainage~~

VEGETATION

Dominant Plant Species	Stratum	Indicator
1. Geranium dissectum	30	UPL
2. Salix exigua	30	OBL
3. Poa annua	30	FACW-
4.		
5.		
6.		
7.		
8.		

Other ~~Common~~ Plant Species	Stratum	Indicator
9. Convovulus arvense	10	
10. Avena fatua	10	
11. Plantain (English)	tr	
12.		
13.		
14.		
15.		
16.		

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

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

- ✓ Recorded Data (Describe in Remarks):
  - ___ Stream, Lake, or Tide Gauge
  - ___ Aerial Photographs
  - ✓ Other 1996-97 wet season survey
- ___ No Recorded Data Available

Field Observations:

Depth of Surface Water: wet season 14-21cm ~~flood~~
Depth to Free Water in Pit: >12" (in.)
Depth to Saturated Soil: 4/4/97 >12" (in.)

Wetland Hydrology Indicators:

Primary Indicators:
- ___ Inundated
- ___ Saturated in Upper 12 Inches
- ✓ Water Marks on trees
- ___ 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)

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): Tisdale 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.
0-12"		7.5YR 3/2	7.5YR 4/6	10%	clay - (denser as it gets deeper)

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: East edge of field along fence line. Disked annually and was farmed in rice since 1800's.

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? (Circle) (Yes) No
degraded

Remarks: This low area along the fenceline - base of canal berm shows indicators of all 3 wetland criteria. However, it is degraded

Approved by HQUSACE 3/92

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

Project/Site: Sutter Power Plant
Applicant/Owner: Calpine Corporation
Investigator: D. Crowe, J. Glazner

Date: 4/3/97
County: Sutter
State: California

Do Normal Circumstances exist on the site? (Yes) No
Is the site significantly disturbed (Atypical Situation)? Yes (No)
Is the area a potential Problem Area? (Yes) No
(If needed, explain on reverse.)

Community ID: annual grassland fallow rice fields
Transect ID: Pool 15
Plot ID: Plot 09
Extension of culvert drainage feature

VEGETATION

Dominant Plant Species	% Cover Stratum	Indicator
1. Plagiobothrys stipitatus	80	OBL
2. Convolvulus arvense	30	NI
3. Phalaris paradoxa	20	NI
4. Alopecurus carolinianus	30	FACW
5. Poa annua	30	FAW-
6.		
7.		
8.		

Other Plant Species	% Stratum	Indicator
9. Cardamine oligosperma	10	
10. Lupeine sp	Tr	
11. Veronica peregrina	5	
12.		
13.		
14.		
15.		
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

✓ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ✓ Other 1996-97 wet season
- ___ No Recorded Data Available

Field Observations:
- Depth of Surface Water: wet season 28 cm ~~Cont~~
- Depth to Free Water in Pit: >4/97 >12" (in.)
- Depth to Saturated Soil: >12" (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- ✓ Inundated
- ✓ 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)

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): Tisdale 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	—	—	loamy
6-12		10YR 3/2	7.5YR 4/6	faint + few	loam/clay

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: Plot is in a distinct basin. Area was farmed in rice since 1800's and disked 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 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.

Approved by HQUSACE 3/92

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

Project/Site: Sutter Power Plant
Applicant/Owner: Calpine Corporation
Investigator: D. Crowe, J. Glazner

Date: 4/22/97
County: Sutter
State: California

Do Normal Circumstances exist on the site? (Yes) No
Is the site significantly disturbed (Atypical Situation)? Yes (No)
Is the area a potential Problem Area? (Yes) No
(If needed, explain on reverse.)

Community ID: annual grassland in former rice field
Transect ID: Pool 31
Plot ID: Plot 10
Borrow pit (W) of Creek 1
0.52 acres

VEGETATION

Dominant Plant Species	~~Stratum~~ % cover	Indicator	~~Dominant~~ other Plant Species	%	Indicator
1. Crypsis schoenoides	20	OBL	9. Abutalon theophrasti	6	NI
2.			10. Veronica peregrina	2	OBL
3.			11. Epilobium pygmaeum	2	OBL
4.			12. Crassula aquatica	2	OBL
5.			13. Pilularia americana	2	OBL
6.			14. Alopecurus carolinianus	2	FACW
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

✓ Recorded Data (Describe in Remarks):
___ Stream, Lake, or Tide Gauge
___ Aerial Photographs
✓ Other 1996-97 wet season surveys
___ No Recorded Data Available

Field Observations:
Depth of Surface Water: wet season 50 cm (in.)
Depth to Free Water in Pit: >14 (in.)
Depth to Saturated Soil: >4/97 14 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
✓ Inundated
✓ 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)

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

Plot 10

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:

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0-6		10YR3/2	–	–	hard baked
6-10		10YR3/2	7.5YR3/1	30%	clay loam
10-14		10YR3/2	–	–	clay

Hydric Soil Indicators:

- ___ Histosol
- ___ Histic Epipedon
- ___ Sulfidic Odor
- ___ Aquic Moisture Regime
- ___ Reducing Conditions
- V 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: Plot was taken in an area used as a borrow pit for construction of the Greenleaf I facility on site. It has left and not maintained for past 10 years.

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 represents two other borrow pit sites in immediate vicinity. The areas were used for soil to make the base of Greenleaf I 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.

Approved by HQUSACE 3/92

Plot 11

SOILS

Map Unit Name (Series and Phase): Gridley clay loam — Drainage Class: somod well drained

Field Observations 20% inclusions

Taxonomy (Subgroup): _____ 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.
0-5"		10YR 3/2+	10YR 4/4	5%	loamy
5-10"		10YR 3/2	7.5YR 3/4	5%	loamy

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 was formed in rice since 1800s and is disked 3 times a year.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)
Wetland Hydrology Present? Yes (No)
Hydric Soils Present? (Yes) No

(Circle)
Is this Sampling Point Within a Wetland? Yes (No)

Remarks: 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.

Approved by HQUSACE 3/92

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

Project/Site: Sutter Power Plant
Applicant/Owner: Calpine Corporation
Investigator: D. Crowe, J. Glazner

Date: 4/22/97
County: Sutter
State: California

Do Normal Circumstances exist on the site? (Yes) No
Is the site significantly disturbed (Atypical Situation)? Yes (No)
Is the area a potential Problem Area? (Yes) No
(If needed, explain on reverse.)

Community ID: annual grassland Fallow rice field
Transect ID: Pool 01
Plot ID: Plot 12
SW corner of property
0.26 ac

VEGETATION

Dominant Plant Species	~~Stratum~~ % Cover	Indicator
1. Rumex crispus	40	FACW
2. Sorghum halepense	20	FACU
3.		
4.		
5.		
6.		
7.		
8.		

Other ~~Dominant~~ Plant Species	~~Stratum~~ % Cover	Indicator
9. Convolvulus arvense	5	
10. Veronica peregrinus	10	
11. Lythrum hyssopifolium	10	
12. Alopecurus carolinianus	10	
13. Digitaria sanguinalis	10	
14. Atriplex patula	5	
15. Bromus hordeaticus	5	
16. Verbena lutoralis or Cyperus eragrostis	tr	

Percent of Dominant Species that are OBL, FACW or FAC (excluding FAC-). 1/2 = 50%

Remarks: Area is a low portion of field at base of canal berm. Plant species are "weedy" species.

HYDROLOGY

✓ Recorded Data (Describe in Remarks):
- ___ Stream, Lake, or Tide Gauge
- ___ Aerial Photographs
- ✓ Other 1996-97 wet season surveys
- ___ No Recorded Data Available

Field Observations:
- Depth of Surface Water: wet season 19 cm ~~(in.)~~
- Depth to Free Water in Pit: >4/97 >12 (in.)
- Depth to Saturated Soil: >12 (in.)

Wetland Hydrology Indicators:
Primary Indicators:
- ✓ Inundated
- ✓ 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)

Remarks: Area ponded water and contained crayfish from nearby canal during vernal pool crustacean surveys - No listed species observed.

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:

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

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? (Yes) No (Circle)
Wetland Hydrology Present? (Yes) No
Hydric Soils Present? (Yes) No

Is this Sampling Point Within a Wetland? (Circle) (Yes) No

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

Approved by HQUSACE 3/92

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

Project/Site: Sutter Power Plant
Applicant/Owner: Calpine Corporation
Investigator: D. Crowe, J. Glazner

Date: 4/22/97
County: Sutter
State: California

Do Normal Circumstances exist on the site? (Yes) No
Is the site significantly disturbed (Atypical Situation)? Yes (No)
Is the area a potential Problem Area? (Yes) No
(If needed, explain on reverse.)

Community ID: annual grassland Former rice field
Transect ID: Pool 4
Plot ID: Plot 13

Former mosquito abatement pond for raising Gambusia
0.11 acre

VEGETATION

Dominant Plant Species	~~% Cover~~ Stratum	Indicator
1. Aster subulatus	20	FACW
2. Typha spp.	30	OBL
3. Populus fremontii	15	X
4. Salix goodingii	15	X
5. Cryptsis schoenoides	30	OBL
6. Rumex crispus	10	X
7.		
8.		
9.		
10.		
11.		
12.		
13.		
14.		
15.		
16.		

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

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

HYDROLOGY

✓ Recorded Data (Describe in Remarks):
__ Stream, Lake, or Tide Gauge
__ Aerial Photographs
✓ Other 1996-97 wet season surveys
__ No Recorded Data Available

Field Observations:
Depth of Surface Water: wet season 55cm (max)
Depth to Free Water in Pit: >4/97 >12" (in.)
Depth to Saturated Soil: >12" (in.)

Wetland Hydrology Indicators:
Primary Indicators:
✓ Inundated
✓ 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)

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

SOILS

Map Unit Name (Series and Phase): Vidale 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-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: The soil was farmed in rice since 1800's. The pool was excavated in 1987 for use as a mosquito abatement pond to raise fish.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? (Yes) No (Circle)

Wetland Hydrology Present? (Yes) No

Hydric Soils Present? (Yes) No

(Circle)

Is this Sampling Point Within a Wetland? (Yes) No

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

Approved by HQUSACE 3/92

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

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

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

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

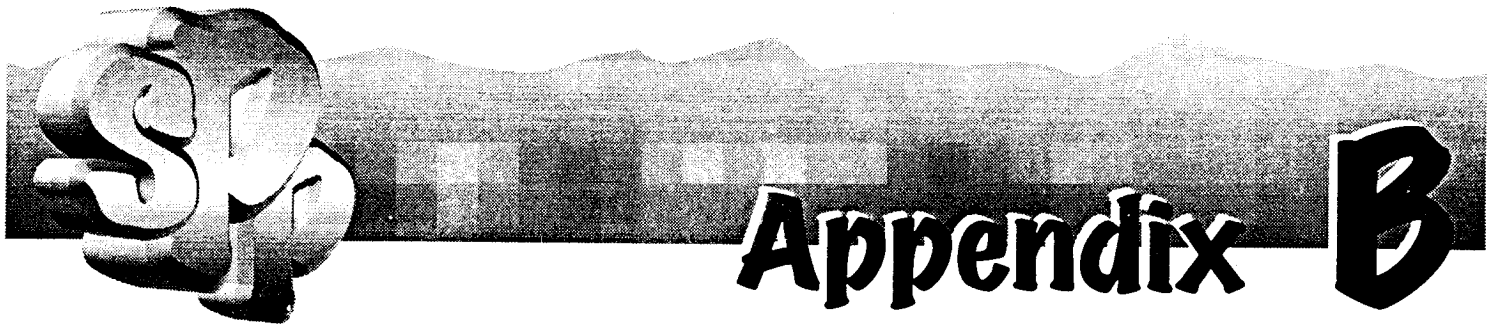
		v	*Vinca major*	greater periwinkle *
	v	v	*Vitis californica*	California wild grape
v	v	v	*Vulpia myuros*	rattail fescue *
v	v		*Xanthium strumarium*	cocklebur

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

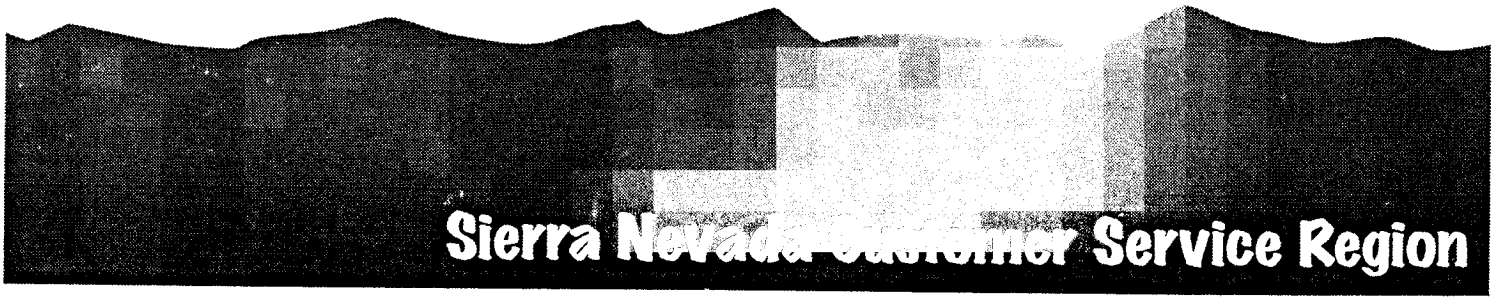
v

Present

* Non-native plant species



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



CALPINE

P.O. BOX 11279
SANTA ROSA, CALIFORNIA 95406-1279
707.527.6700
707.544.2422 (fax)

September 30, 1998

Mr. Brad C. Hubbard
United States Army Corps of Engineers
Sacramento District
Regulatory Branch
1325 J Street, Room 1480
Sacramento, California 95814-2922

RE: **REQUEST FOR DEPARTMENT OF THE ARMY CLEAN WATER ACT SECTION 404 INDIVIDUAL PERMIT FOR FILLING WETLANDS ON THE PROPOSED SUTTER POWER PLANT PROJECT SITE, SUTTER COUNTY, CALIFORNIA, PROJECT IDENTIFICATION NUMBER 199700183**

Dear Mr. Hubbard:

Enclosed is an application for a Department of the Army permit to fill 5.83 acres of jurisdictional seasonal wetlands pursuant to Section 404 of the Clean Water Act. The jurisdictional wetlands are located on property owned by Calpine Corporation approximately 7 miles southwest of Yuba City in Sutter County, California. Calpine Corporation is proposing to construct a 500-MW merchant power plant on the property. The proposed project, identified as Sutter Power Plant (SPP), will be one of the first merchant power plants developed under the newly deregulated energy market in California. Construction of the SPP will require approximately 16.0 acres of land area that contains seasonal wetlands surrounded by disturbed annual grasslands.

A wetland delineation for the SPP project site was conducted in April 1997 using the methods outlined in the USACE 1987 Wetland Delineation Manual and submitted to the Sacramento District USACE on June 16, 1997. Ginger Fodge of the USACE conducted a site visit on June 23and verified the delineation on June 30, 1997 (Project Identification number 199700183).

In California, a Clean Water Act Section 401 water quality certification (401 certification) from the California Regional Water Quality Control Board (CRWQCB) is necessary to fill wetlands in conjunction with a 404 permit. Calpine will obtain a 401 certification from the CRWQCB before construction begins. A copy of the water quality certification will be sent to your office when received.

Attachment A contains supplemental information that could not fit in the ENG form 4345 Blocks. Attachment B presents the Sutter Power Plant project location map. Attachment C shows the jurisdictional wetland impact areas. A wetlands alternatives analysis for the project under the Clean Water Act (CWA) Section 404 (b)(1) guidelines and NEPA is included as Attachment D. Attachment E presents the Sutter Power Plant Wetland Mitigation Plan. Appendix F presents the On-Site Wetland Protection Plan for wetlands remaining on the Calpine property.

Sincerely,

Charlene Wardlow

Charlene Wardlow
Environmental Manager

Attachments: Department of the Army ENG Form 4345
Attachment A: Supplemental information for ENG form 4345
Attachment B: Project Location map
Attachment C: Jurisdictional wetland impact areas and project features
Attachment D: Wetlands alternatives analysis
Attachment E: Wetland Mitigation Plan

cc: P. Richens (CEC)
L. McMahon (Western)
D. Davy (Foster Wheeler)
D. Crowe (CH2M Hill)

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT
(33 CFR 325)

OMB APPROVAL NO. 0710-003
Expires October 1996

PRIVACY ACT STATEMENT

Authority: 33 USC 401, Section 10; 1413, Section 404. Principal Purpose: These laws require permits authorizing activities in, or affecting navigable waters of the United States, the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters. Routine Uses: Information provided on this form will be used in evaluating the application for a permit. Disclosure: Discharge of requested information is voluntary. If information is not provided, however, the permit application cannot be processed nor can a permit be issued.

One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETED

(ITEMS TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE *(an agent is not required)*
Calpine Corporation - Charlene Wardlow (see attachment for associated parties)	
6. APPLICANT'S ADDRESS	**9. AGENT'S ADDRESS**
1160 N. Dutton, Suite 200 Santa Rosa, CA. 95401	
7. APPLICANT'S PHONE NOS. W/AREA CODE	**10. AGENT'S PHONE NOS. W/AREA CODE**
a. Residence	a. Residence
b. Business 707.527.6700 ext. 727	b. Business

11. STATEMENT OF AUTHORIZATION

I hereby authorize _____ to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

APPLICANT'S SIGNATURE DATE

NAME, LOCATION AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)

Sutter Power Plant

13. NAME OF WATERBODY, IF KNOWN *(if applicable)*	14. PROJECT STREET ADDRESS *(if applicable)*
Seasonal Wetlands	5087 S. Township Road Yuba City, CA. 95993 Parcel Number: A.P.No. 21-230-25
15. LOCATION OF THE PROJECT	
Sutter (COUNTY) California (STATE)	

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN. *(see instructions)*

Township 14N , Range 2E, ¼NE, ¼NE on Gilsizer Slough quadrangle

17. DIRECTIONS TO THE SITE

From Yuba City travel south on Highway 99 (or North from Sacramento) West on O'Banion Rd, North on S.Township Rd. 1½ mile to site on west side of road.

(see attachment B for location map)

18 Nature of Activity *(Description of project, include all features)*

See Attachment A

19 Project Purpose *(Describe the reason or purpose of the project, see instructions)*

See Attachment A

USE BLOCKS 20-22 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20 Reason(s) for Discharge

See Attachment A

21 Types of Material Being Discharged and the Amount of Each Type in Cubic Yards

See Attachment A

22 Surface Area in Acres of Wetlands or Other Waters Filled *(see instructions)*

See Attachment A

23 Is Any Portion of the Work Already Complete? Yes X No _____ IF YES, DESCRIBE THE COMPLETED WORK

See Attachment A

24 Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (If more than can be entered here, please attach a supplemental list).

See Attachment

25. List of Other Certifications or Approvals/Denials Received from other Federal, State or Local Agencies for Work Described in this Application

AGENCY	TYPE OF APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
See Attachment A					

*Would include but is not restricted to zoning, building and flood plain permits

26 Application is hereby made for a permit or permits to authorize the work described in this application. I certify that the information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

Charles L Waidlow	9-28-98		
SIGNATURE OF APPLICANT	DATE	SIGNATURE OF AGENT	DATE

The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in Block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both

Attachment A
Department of the Army Permit Application Supplement

Note: The Block numbers addressed in this permit application refers to the **Application Form ENG 4345** provided by the U.S. Army Corps of Engineers Sacramento District office (copy attached).

Blocks 1 through 4 to be completed by the U.S. Army Corps of Engineers

Blocks 5, 6, 7:

Applicant: Calpine Corporation
Contact: Charlene Wardlow
Environmental Manager
1160 N. Dutton, Suite 200
Santa Rosa, California 95401
(707) 527-6700, extension 727

Lead federal agency: Western Area Power Administration (Western)
Contact: Loreen McMahon
Project Manager
Sierra Nevada Region
114 Parkshore Drive
Folsom, California 95630-4710
(916) 353-4460

Lead State Agency: California Energy Commission (CEC)
Contact: Paul Richins
Project Manager/Planner
Energy Facilities Siting Division
1516 9th Street, MS-48
Sacramento, California 95814-5512
(916) 654-4074

Block 8 through 11: Authorized agent

None

Block 18: Nature of Activity

Calpine Corporation (Calpine) plans to construct and operate a 500-MW gas-fired merchant power plant in central Sutter County, California approximately 7 miles southwest of Yuba City (Attachment B). Sutter Power Plant (SPP), the proposed project, will be built adjacent to Calpine's existing 49.5-MW Greenleaf Unit 1 cogeneration facility. The current cogeneration facility occupies 12.3 acres of Calpine's 77-acre parcel on South Township Road.

The proposed SPP project will consist of generators, dry cooling towers, an evaporation pond, crystal clarifier, or waste collection unit, Heat Recovery Steam Generator (HRSG) emission stacks, operations buildings, an access road, and asphalt parking lots. All solids from dry cooling will be disposed of in an off-site disposal facility. Calpine will require a land area of approximately 16.0 acres (880 feet by 920 feet) for the SPP footprint. The footprint will require a five-foot thick platform of fill material to support electrical power plant operations (Attachment C-1). The SPP will require a 0.73-acre (1325 feet long by 25 feet wide) access road from South Township Road.

Ancillary facilities to the SPP include 14.9 miles of Pacific Gas and Electric (PG&E) natural gas pipeline and 4.0 miles of a 230-kV Western Area Power Administration (Western) electric transmission lines and a switchyard are proposed to connect the SPP facility to existing utility lines (Attachment C-2). The 16-inch diameter PG&E natural gas pipeline will run north from the SPP site and then west, cross the Sutter National Wildlife Refuge (Sutter NWR) within the Sutter Bypass, and connect to an existing pipeline east of the Sacramento River (Attachment C-2). The gas pipeline will cross waters of the U.S. within the Sutter Bypass channels and three large irrigation canals that are tributaries to natural waterways. The pipeline will be bored underneath these waterways to avoid impacts. The gas pipeline will be constructed under a paved road (Hughes Road) within the Sutter NWR so that all wetlands within the Sutter NWR will be avoided. The gas pipeline will not cross the Sacramento River.

The following project activities will not affect waters of the U.S. The 230-kV transmission line will run south from the SPP site along South Township Road and then west on O'Banion Road to connect to a proposed switchyard south of O'Banion Road at the east levee of the Sutter Bypass. The electric transmission line poles will be constructed along canal berms or in agricultural fields. Expansion of two natural gas dehydrator stations in Sutter and Colusa counties will require 0.2 acre of wheat and walnut crops. Upgrades to a 4-inch diameter natural gas gathering system in Colusa County will also be conducted as part of the SPP project but will not affect waters of the U.S. Groundwater from on-site wells will be used for the SPP operations.

Calpine is expected to begin construction of the SPP in the first quarter of 1999 and construction of the gas pipeline and electric transmission lines in 2000. Construction is expected to be complete by the fourth quarter of 2000. A detailed project description is included in the Application for Certification (AFC) that was submitted to the California Energy Commission (CEC) on December 15, 1997.

Block 19: Proposed Project Purpose.

Demand Conformance (Section 3 taken from the Sutter Power Plant Application for Certification document)

The California Energy Commission (CEC) biennially determines the "integrated assessment of need" for new power plants in California. In this assessment, the CEC determines the effect on various public policy goals from building or purchasing new power resources. Section 25524 of the Public Resources Code states that only those power plants affirmatively found to be in conformance with the CEC's integrated assessment of need (or demand) may be certified. The CEC's integrated assessment of need is reported in the Biennial Electricity Report. The latest final version available is the 1994 Biennial Electricity Report (ER 94) which was published in November 1995. In ER 94, the CEC developed conformance criteria for several categories of power plants, including merchant plants. The definition of a merchant plant is "a plant owned neither by a utility nor by an affiliate selling to its affiliated utility." Since the SPP will be operating competitively and is not owned by a utility or a utility's affiliate, it is a merchant plant. The CEC's assessment of California's energy needs for the period 1994 to 2005 was determined to be an additional 6,580 megawatts (MW). The criterion established to determine the need for merchant plants is that any merchant plant will be found needed provided its addition does not result in a total addition to California's capacity greater than one-half of the 6,580 MW, or 3,290 MW.

The draft of the CEC's 1996 Biennial Electricity Report (ER 96) states that the CEC's position on merchant plants is the same as in ER 94 except the one-half capacity limitation has been eliminated and all power plants (including merchant plants) will be found needed provided the total quantity of capacity permitted does not exceed the projection of need for the period 1996 to 2007. The CEC's projection of need for that period is 6,737 MW.

At this time, no merchant plants have been added to reduce the allowed 3,290 MW in ER 94 or the 6,737 MW allowed in Draft ER 96. At this time, three applicants in addition to SPP have indicated an intent to develop merchant plants in California. The total capacity of the plants represented by the three applicants is 1,500 to 1,700 MW. The SPP is a nominal 500 MW, for a total of 2,000 to 2,200 MW of new capacity. This is less than the allowed 3,290 MW under ER 94 and far less than the allowed 6,737 under Draft ER 96. The SPP, therefore, meets the demand conformance requirements of Section 25524 of the Public Resources Code and the CEC Rules of Practice and Procedure and Power Plant Site Certification Regulations Section 1720.5. Calpine plans to begin construction the first quarter of 1999 and complete construction in the fourth quarter of 2000.

CEC (California Energy Commission). 1995. 1994 Biennial Electricity Report (ER94). P300-95-002. November 1995.

CEC. 1997. Draft 1996 Biennial Electricity Report (ER96).

Block 20: Reason(s) for Discharge.

Construction of the SPP project will result in the discharge of fill material to seasonal wetlands on the site. Fill material will be used to raise the SPP footprint five feet above the current

topography to support power plant operations.

Block 21: Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards.

The SPP footprint base will be constructed to a depth of five feet, which will require a total of 115,000 cubic yards of fill material. The fill material will consist of approximately 7,000 cubic yards of gravel underneath the dry cooling tower and 108,000 cubic yards of well-graded structural backfill material under the remaining footprint. The exact material will be determined during the contractor selection process. The backfill material will not contain clay or topsoil with organic material. The surface of the footprint base will be capped with concrete in all areas except the dry cooling tower location.

Block 22: Surface Areas of Wetlands or Other Waters Filled.

A total of 8.67 acres of jurisdictional wetlands formed in excavated areas or topographically low areas on the SPP site (Attachment C-1). The jurisdictional seasonal wetlands are man-made resulting from excavations performed in 1987 for construction of Calpine's Greenleaf Unit 1. A total of 5.83 acres of these wetlands will be lost on the project site, including 3.0 acres for the SPP footprint and 2.83 acres that may be indirectly impacted during construction or from development of a detention/evaporation pond if determined necessary by Calpine and Sutter County for flood control (Attachment C-1). The remaining 2.84 acres of jurisdictional wetlands will not be impacted by the project.

The jurisdictional wetlands that will be lost include four borrow pit wetlands and four of the seasonal depression wetlands north of the Greenleaf Unit 1 effluent canal and cogeneration facility (Attachment C-1). No threatened or endangered species are known to inhabit the wetlands on-site.

The wetlands on site will be filled using a backhoe and dump trucks. No material will be dredged from the wetlands.

No jurisdictional waters will be filled along the electric transmission line and natural gas pipeline routes. The wetlands within the Sutter NWR that encroach on the 100-foot county road easement along Hughes Road will be flagged and avoided during construction of the gas pipeline. The gas pipeline will be directional drilled underneath the jurisdictional water channels within the Sutter Bypass (Butte Slough) and three large irrigation canals along the route.

The irrigation canals, flooded rice fields, and water channels in the Sutter Bypass (Butte Creek watershed) are habitat for several special-status species: Federal and California endangered winter-run chinook (*Oncorhynchus tshawytscha*), Federal and California threatened giant garter snake (*Thamnophis gigas*), Federal proposed endangered spring-run chinook salmon and Central Valley steelhead (*Oncorhynchus mykiss*), Federal proposed threatened fall-run and late fall-run

chinook salmon and Sacramento splittail (*Pogonichthys macrolepidotus*), and Federal a Species of Concern western pond turtle (*Clemmys marmorata marmorata*). Special-status aquatic species will not be affected by the project. A Biological Opinion from U.S. Fish and Wildlife Service is forthcoming.

Block 23: Is Any Portion of the Work Already Complete?

A groundwater well was constructed on the site in January 1998. No other development has occurred for the proposed Sutter Power Plant project. Calpine's Greenleaf Unit One cogeneration facility currently occupies 12 acres of the 77-acre property parcel.

Block 24: Names and Addresses of Adjoining Property Owners, Lessees, etc., Whose Property Adjoins the Project Site.

No adjacent property owners adjoin the isolated seasonal wetlands on the Calpine property. The property owners adjacent to the Calpine property proper include:

Neighbor to the west and northwest:
Hunt, Harry B. and Dorothy
4596 Pierce Road
Yuba City, California 95993

Neighbor to the north:
Rose, Judith and Ron
422 Second Street
Yuba City, California 95993

Neighbor to the south:
Siller Brothers
P.O. Box 1585
Yuba City, California 95993

Neighbor to the east:
Sutter Extension Water District
4525 Franklin Road
Yuba City, California 95993

These neighbors have already been publicly noticed about the project during the California Energy Commission Application For Certification (CEQA equivalent) and NEPA processes.

Block 25: List of Other Certification or Approvals/Denials Received from other Federal, State or Local Agencies for Work Described in this Application.

A copy of each approval will be sent to your office when received.

Agency	Type of approval	Identification number	Date applied	Date approved	Date Denied
California Regional Water Quality Control Board	Clean Water Act Section 401 Water Quality Certification	-	In progress	In Progress	-
California Energy Commission	Certification of Power Plant	-	December 15, 1997	In progress	-
U.S. Fish and Wildlife Service	Biological Opinion from Endangered Species Act Section 7 Consultations	1-1-98-I-1390	June 8, 1998	In progress	-
California Department of Fish and Game	Streambed Alteration Agreement	-	In progress	In progress	
California Department of Fish and Game	Memorandum of Understanding for California Endangered Species Act consultations	-	In progress	In progress	-

Block 25: List of Other Certification or Approvals/Denials Received from other Federal, State or Local Agencies for Work Described in this Application.

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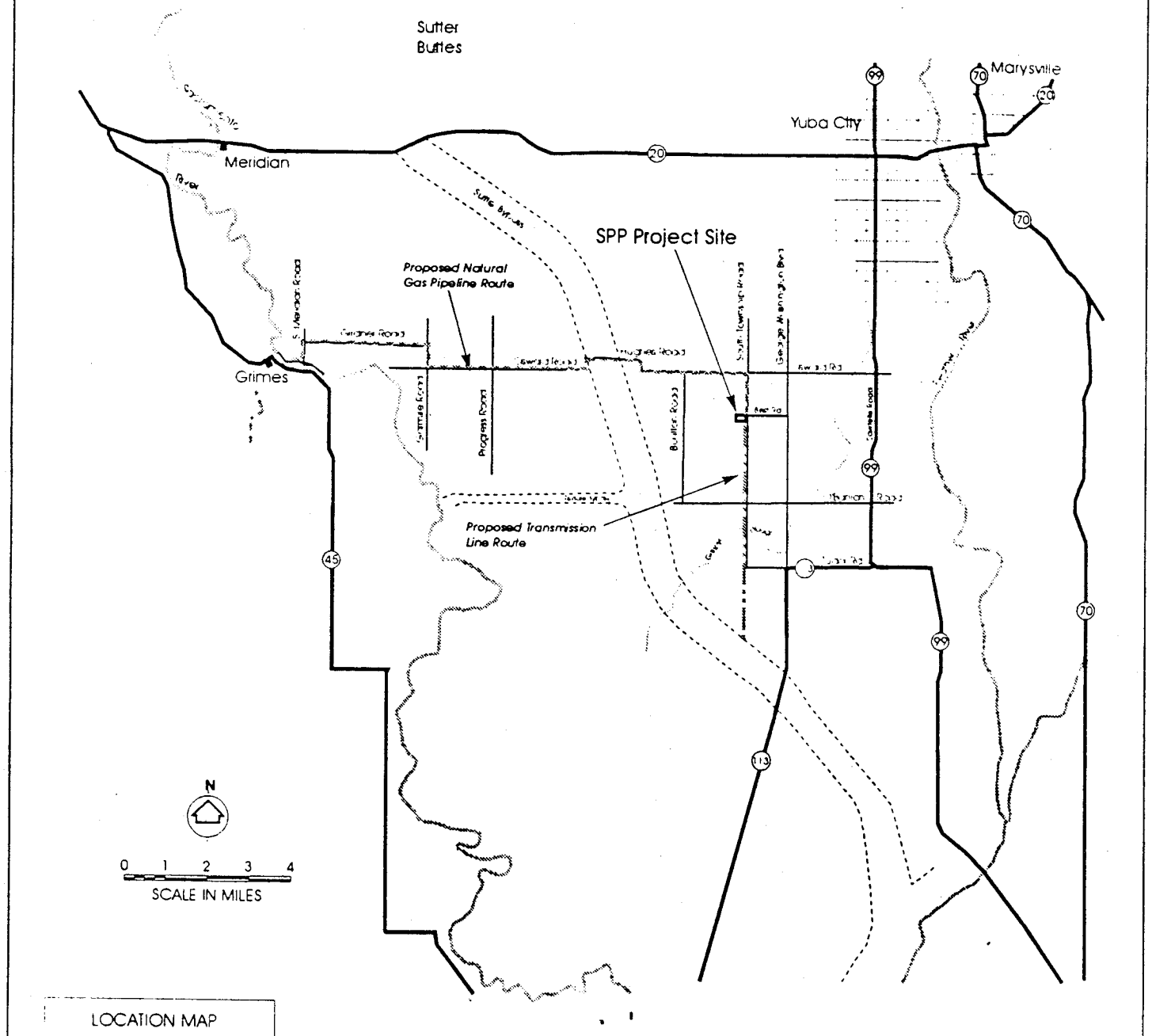
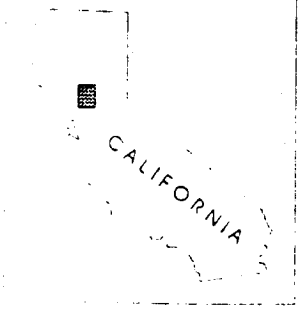
California Department of Fish and Game	Memorandum of Understanding for California Endangered Species Act consultations	-	In progress	In progress	-

ATTACHMENT B

PROPOSED SUTTER POWER PLANT LOCATION MAP



LOCATION MAP



LEGEND

- Plant site
- Proposed transmission line route
- Proposed gas pipeline route

ATTACHMENT B

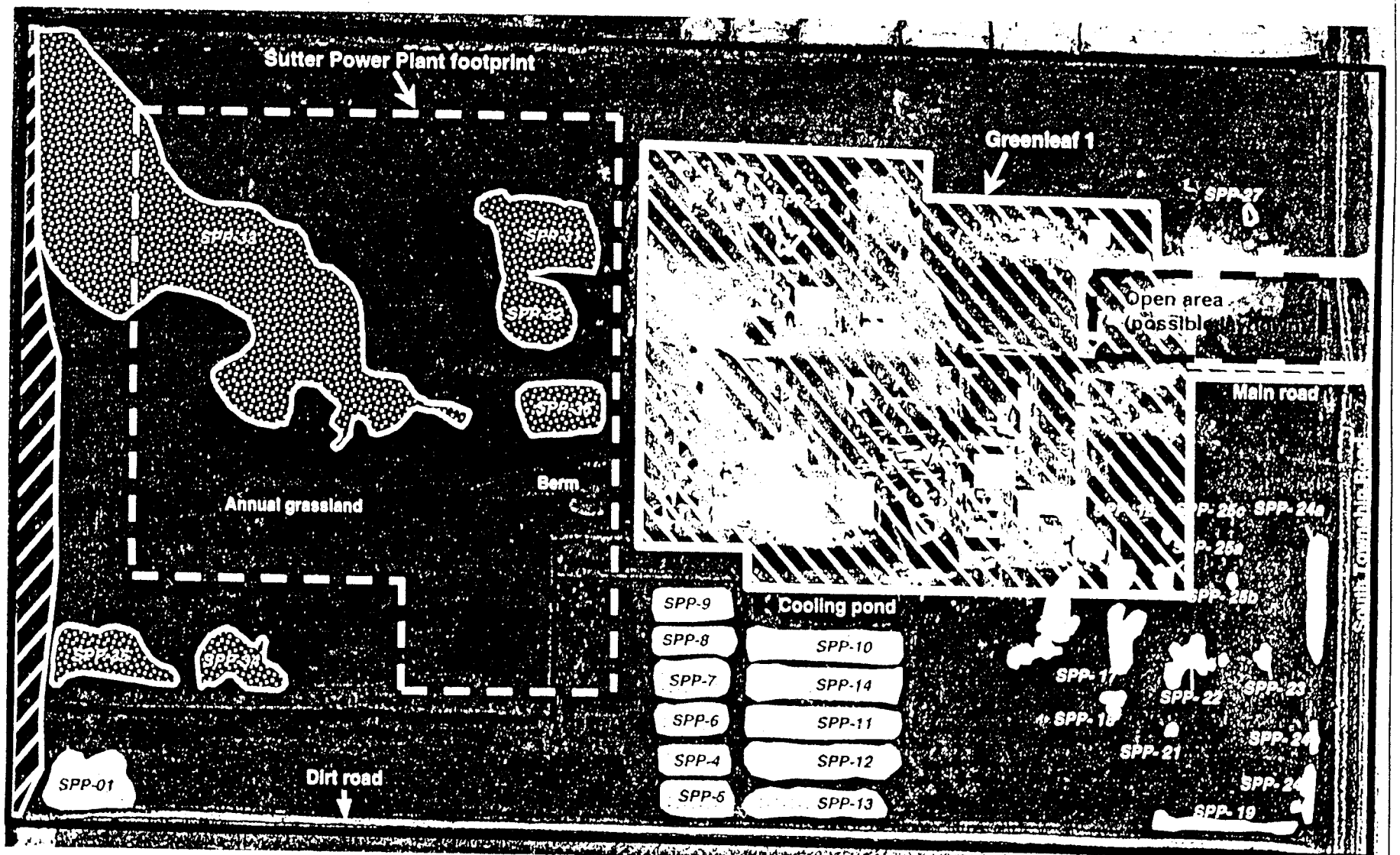
SUTTER POWER PLANT PROJECT

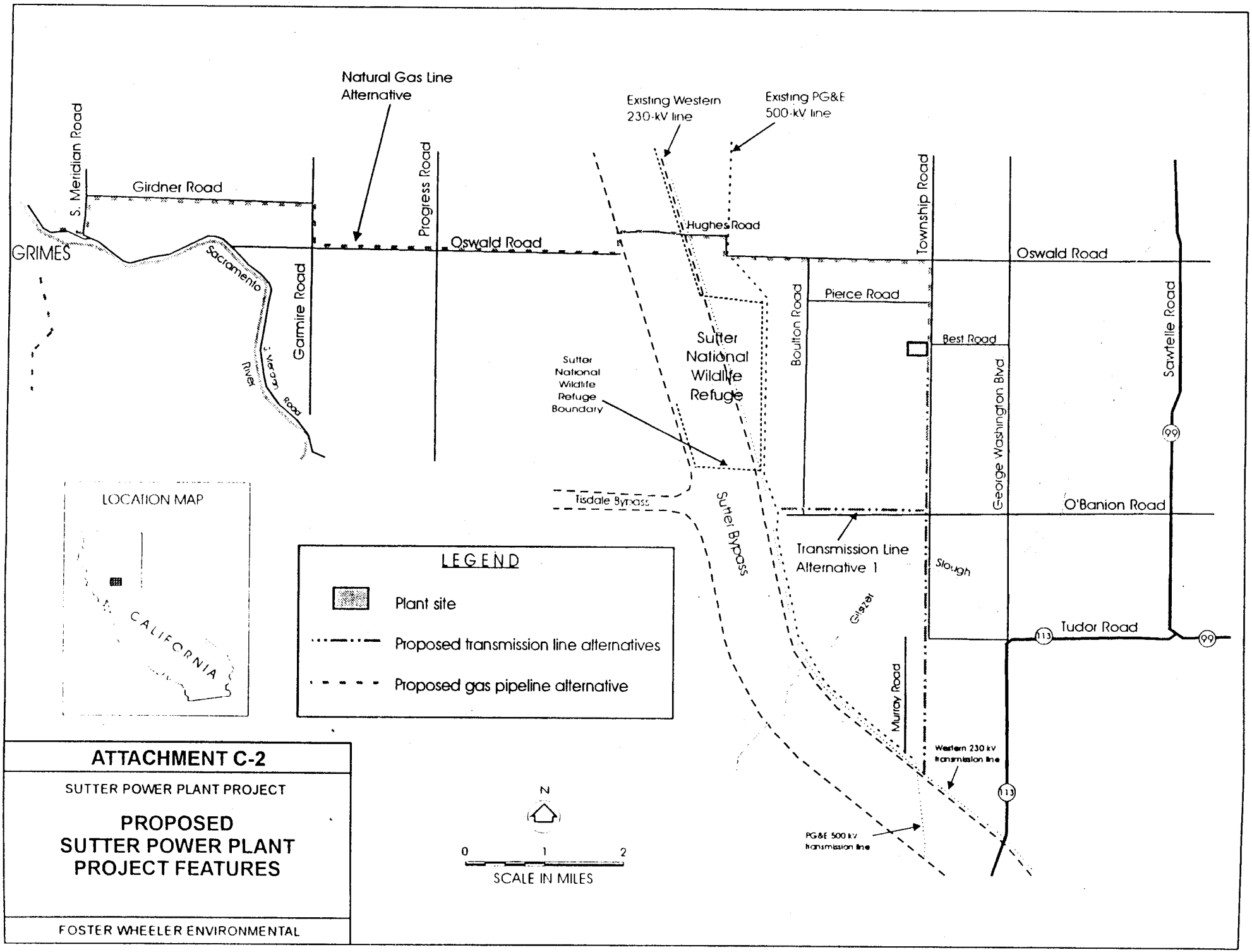
PROPOSED SUTTER POWER PLANT LOCATION MAP

FOSTER WHEELER ENVIRONMENTAL

ATTACHMENT C

PROPOSED SUTTER POWER PLANT WETLAND IMPACT AREAS


Sutter Power Plant footprint
Greenleaf 1
SPP-33
SPP-31
SPP-32
SPP-36
SPP-37
Open area
(possible laydown)
Main road
Berm
Annual grassland
SPP-9
SPP-8
SPP-7
SPP-6
SPP-4
SPP-5
Cooling pond
SPP-10
SPP-14
SPP-11
SPP-12
SPP-13
SPP-25
SPP-34
SPP-01
Dirt road
SPP-17
SPP-18
SPP-22
SPP-23
SPP-21
SPP-24
SPP-19
SPP-26c
SPP-24a
SPP-26a
SPP-26b
N
Habitats
Blackberry brambles
Industrial
Calpine property boundary
ATTACHMENT C-1
PROPOSED WETLAND IMPACT AREAS ON CALPINE PROPERTY SUTTER COUNTY CA



ATTACHMENT C-2

SUTTER POWER PLANT PROJECT

PROPOSED SUTTER POWER PLANT PROJECT FEATURES

FOSTER WHEELER ENVIRONMENTAL

ATTACHMENT D

WETLANDS ALTERNATIVES ANALYSIS FOR SUTTER POWER PLANT PROJECT

Under the Clean Water Act (CWA) Section 404 (b)(1) guidelines and NEPA, alternatives to the project need to be evaluated with respect to environmental impacts. Alternative sites were identified and evaluated by Calpine and the CEC that could potentially support a 500 MW electric power plant. A Preliminary Staff Assessment (PSA) prepared by the CEC staff in coordination with Western Area Power Administration (Western) presents the alternatives analysis. The evaluation examined the "feasibility of available site and facility alternatives to the applicant's proposal which substantially lessen the significant adverse impacts of the proposal on the environment." A total of eleven sites were initially screened for suitability and four sites were evaluated further. These sites are identified as the SEPCO SAC1, SEPCO S1, East Sutter 4, and O'Banion Road sites (Figure D-1). The following paragraphs were taken from the PSA, which describes the alternatives analysis.

> *The **SEPCO SAC1** site was determined to be better overall than the proposed SPP site because it is zoned for power plant usage, would have better and closer fire protection services, avoids conflicts with aerial applicators, has impact on water resources, and is much closer to the Elverta substation.*
>
> *Factors that made SAC1 worse in comparison are primarily due to its close proximity to a much greater number of residential areas (less than ½ mile). These areas create concerns for hazardous materials incident consequences, impacts on traffic and transportation, and impacts on visual resources. In addition, biological resources impacts would be worse than at the SPP site due to the routing of the natural gas supply line.*
>
> *The **SEPCO S1** site was deemed to be the worse in comparison overall due to proximity of sensitive receptors to hazardous materials incidents and noise, fire protection concerns, potential land use conflicts, and impacts on visual. Also, as with the SAC1 site, biological resources impacts would be worse than at the SPP site due to the routing of the natural gas supply line. Positive factors of this site were related to its close proximity to Western's Keswick-Elverta 230-kV transmission line that would avoid all impacts of an interconnecting transmission line.*
>
> *The **East Sutter 4** site was found to be the same as the proposed SPP project for overall environmental impacts. Factors that made this site better were the site's faster fire service response time, existing zoning for industrial use, and the potential for a reduced level of environmental impacts on cultural and paleontological resources. Factors deemed worse were the proximity to the unincorporated community of Sutter (for*

hazardous materials impacts), impacts on the views of the Sutter Buttes range, and water resource impacts due to expected limitations on groundwater availability in the immediate area.

*The **O'Banion Road** site was found to be better overall than the proposed SPP site. Because there are fewer close residents, the effects of potential hazardous materials incidents would be reduced. Visual impacts due to the power plant's buildings, stacks and steam plumes would be reduced by the physical location of the site away from residences and roads. Also, visual impacts posed by an interconnecting transmission line would be avoided altogether because such a line would be unnecessary.*

This same factor of no transmission line would avoid impacts on agricultural land uses, would be better from a transmission system engineering aspect and, would avoid impacts to migrating waterfowl. However, the existence of PG&E's transmission lines between this site and Western's system may be problematic for reasons of practicality and feasibility. Staff recognizes this, but has not had the opportunity to review the matter thoroughly.

In addition, this site would either avoid or reduce impacts on water and biological resources (in addition to the benefits of no transmission line). Ground water pumping effects on other users; flooding of other parcels and roadways; and biological habitat impacts on some species, such as the giant garter snake and Swainson's hawk, would be reduced or eliminated.

One technical area, noise, was deemed to be worse due to a residential dwelling existing at the immediate northwest corner of this site. Although this situation would require some form of mitigation, it was not seen to be a "fatal flaw" for this analysis.

The CEC alternatives analysis appears to favor the O'Banion site as the preferred alternative site for the SPP. However, the CEC staff did not address the close proximity to the proposed expansion of the Sutter NWR and habitats in the Sutter Bypass. The 145-foot HRSG stacks could cause a significant impact to migratory birds that use the Sutter NWR. The O'Banion site lies between two water channels that are habitat for giant garter snake and is closer to the giant garter snake population inhabiting Gilsizer Slough than the SPP site.

Wetland impacts would be greater on the SEPCO SAC1 and S1 sites and the SAC1 site contains listed vernal pool fairy shrimp. The East Sutter 4 and O'Banion sites are in active wheat and rice production, respectively, and are habitat for giant garter snake and Swainson's hawk. The CEC will review the alternatives further for the Final Staff Assessment (FSA).

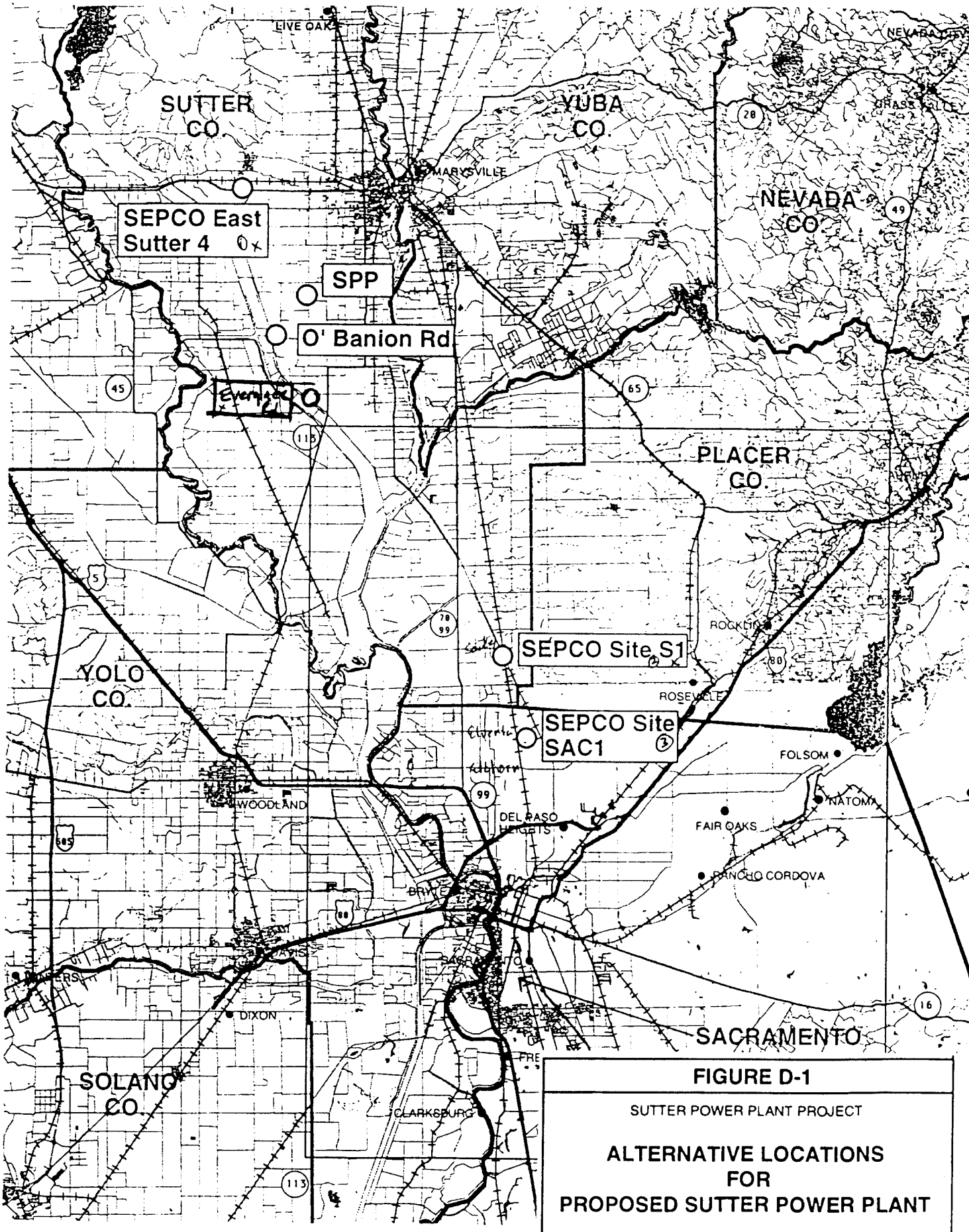


FIGURE D-1

SUTTER POWER PLANT PROJECT

ALTERNATIVE LOCATIONS FOR PROPOSED SUTTER POWER PLANT

FOSTER WHEELER ENVIRONMENTAL

ATTACHMENT E

WETLAND MITIGATION PLAN FOR SUTTER POWER PLANT

Calpine developed this mitigation plan under consultation with the USACE and USFWS to minimize impacts to wetlands in the Central Valley. Avoidance of all jurisdictional wetlands on the SPP site was not feasibly possible. However, the proposed footprint was moved east closer to Greenleaf Unit 1 and rotated 90 degrees to minimize the acres of wetlands impacted. It was also placed to avoid impacts to the drainage canal (potential wildlife habitat) west of the Greenleaf Unit 1 facility. The direct loss of 3.0 acres of wetlands is unavoidable.

Calpine is proposing to mitigate for the 3.0 acres of wetlands and also the 2.83 acres of seasonal wetlands west of the SPP location and north of Greenleaf 1 for a total of 5.83 acres (Table E-1). The proposed mitigation includes wetland replacement of 5.83 acres in an off-site location. Off-site mitigation includes construction/preservation of like kind (seasonal) wetlands, monitoring the success of construction, and management of the wetland habitats in perpetuity.

There are no USFWS/USACE approved mitigation banks in Sutter County. A mitigation bank, managed by Wildlands, Inc., is being established relatively close to the SPP project in Colusa County. The CDFG (Dave Zezulak) has given approval for mitigation at this location for giant garter snake and Swainson's hawk forage habitat also. The Sutter NWR manager is also preparing a cost estimate for mitigation of giant garter snake and wetlands in the refuge expansion project.

The mitigation ratio for wetland replacement was discussed with the USACE and USFWS. Ginger Fodge of the USACE recommended a 1:1 replacement ratio after a site visit in June 1997. Mark Littlefield of the USFWS recommended a ratio greater than 1:1 but would stand by the USACE recommendation as long as there are no listed species inhabiting the wetlands. Calpine is proposing a 1:1 mitigation ratio for the man-made, degraded wetlands on-site. There are no listed species, including listed vernal pool fairy shrimp, occurring in the wetlands.

Creation of vernal pool habitat off-site may improve the wetland value in the Central Valley with the enhancement of native vernal pool species. Off-site mitigation wetlands are normally vegetated with native vernal pool plant species. Only one of these species was found in the SPP site wetlands. Reduction of wetlands on-site would decrease the attraction of birds to the wetlands, thereby, potentially reducing the number of avian collisions in the project area.

A mitigation fund will be set up with the CEC, USFWS, USACE and mitigation area before construction in wetlands begins. Calpine is expecting to begin construction in the first quarter of 1999.

Table E-1. Wetland acres impacted by SPP construction in each project area.	
Project area	Wetlands impacted (acres)
SPP footprint and access road	3.0
Surrounding footprint/Detention pond*	2.83
Gas pipeline	0
Dehydrator stations	0
Electric transmission line	0
Switchyard	0
Total wetland acres impacted	5.83
Mitigation ratio	1:1
Total replacement habitat required	5.83
*Possible temporary impact only.	

ATTACHMENT F

ON-SITE WETLAND PROTECTION PLAN FOR SUTTER POWER PLANT PROJECT

Note: This On-Site Wetland Protection Plan was developed to monitor wetlands remaining on site after construction of the evaporative cooling towers as part of the SPP facility. Evaporative cooling towers emit a fine mist potentially containing particulate matter and salts. The wetland monitoring section of this On-Site Wetland Protection Plan was to monitor for potential impacts from the cooling tower drift and indirect construction activities. ***Calpine Corporation has decided to replace the evaporative cooling towers with dry cooling towers that do not emit substances to the atmosphere.*** *Potential impacts from cooling tower drift are no longer a part of the project and construction activities are not expected to occur in the area where the remaining wetlands are located. The CEC included the wetland monitoring requirements in their Preliminary Staff Assessment. Because Calpine has eliminated impacts from the construction and operation of SPP, the CEC will most likely not require monitoring of wetlands remaining on-site (Personal communication between Linda Spiegel (CEC biologist) and Debra Crowe (project biologist), September 22, 1998). The wetland monitoring plan will be implemented only if the CEC and Calpine determine it to be necessary after final project review. The determination will be included in the CEC Final Staff Assessment for the project.*

As discussed in the previous sections, eight seasonal wetlands encompassing 5.83 acres will be lost to construction of the SPP on the Calpine property. Twenty-two seasonal wetlands encompassing 2.84 acres will remain on-site after construction (Attachment C-1). As a Condition of Certification (BIO-11 in the CEC Preliminary Staff Assessment, July 1, 1998) of the SPP project, the CEC requires that the remaining wetlands on-site be monitored for functionality on an annual basis for the life of the project (expected 30 years), with the potential to decrease the monitoring frequency or cease monitoring if the first five years of monitoring shows the SPP has no impact on the remaining wetlands.

Wetland ecosystems and surrounding landscapes are dynamic and constantly changing. Variability in the wetland ecosystems resulting from natural processes needs to be taken into account when monitoring over a period of time. Short-term changes in seasonal weather cycles such as temperature and precipitation (drought and floods) can produce variability in wetland function from year to year. Documenting change is useful but the ultimate objective is for the wetlands to retain a functional capacity. Because the wetlands on the SPP site are man-made and have developed to their present state over a relatively short period of time, they are expected to show changes over the monitoring period, probably for the better. Functional capacity of the seasonal wetlands on the SPP site includes the ability of the wetland to hold water and support wetland plant species, and in some instances are habitat for aquatic invertebrates.

Responsible Parties

1. Preparer of Department of the Army application, wetland delineation, proposed mitigation and monitoring plans:
   Debra Crowe
   CH2MHILL (formerly with Foster Wheeler Environmental Corporation)
   Wetlands/Wildlife Biologist
   2485 Natomas Park Drive, Suite 600
   Sacramento, California 95833
   (916) 920-0212, extension 385

2. Party with financial responsibility:
   Calpine Corporation

3. Present owner of wetland monitoring site:
   Calpine Corporation

4. Expected long-term owner and party responsible for long-term monitoring:
   Calpine Corporation

Wetland Protection Methods

Potential indirect impacts to remaining seasonal wetlands on-site include soil compaction from construction vehicles, debris and stormwater runoff into wetlands, disking for fire control, and temporary construction impacts to vegetation. Indirect impacts are not expected to occur, however, several protective measures will be implemented during construction, operation, and maintenance of the SPP to ensure protection of the remaining wetlands on the Calpine property.

1. During construction of the SPP, construction debris and runoff will be confined to immediate construction areas by use of impermeable fence barriers near remaining wetlands.
2. During operation of the SPP, stormwater runoff will be routed away from wetlands to the discharge canal on site
3. Construction vehicles will be limited to access roads and construction areas only. Construction zone limits that identify sensitive habitats by flagging and/or signage will be implemented.
4. If construction of the SPP unexpectedly requires construction vehicles to access wetland areas, the activity will be limited to months when the soils are dry and hard. A protective cloth/platform (temporary platform from railroad ties, wire mesh, or other material that supports heavy equipment) that protects against soil compaction will cover the wetland before access to vehicles is allowed.
5. Revegetation of disturbed habitats will be implemented after construction is complete. Revegetation of habitats will include like-kind species, i.e., grassland species in grassland areas and wetland species in wetland areas.
6. The grasslands on-site, which include the seasonal wetlands, will be mowed during the

summer for fire control instead of disking to preserve the integrity of wetland soils and potentially increase the number of wildlife species that inhabit the wetlands and grasslands. Mowing simulates the historic grazing that occurred in the area before farming and may allow soils to develop defined horizons. Wetlands with trees and cattails (former mosquito abatement ponds) will be left undisturbed as in previous years.

7. Preconstruction and post-construction aerial photographs will be taken and analyzed to determine the amount of wetland taken by the SPP or impacted outside the footprint. A monitoring report will be submitted to the CEC and USACE documenting wetland acreage affected by construction.
8. A fund to finance the monitoring program will be set up before construction is complete. The fund will cover the first five years of monitoring costs and be updated if it is determined by Calpine and CEC that further monitoring is warranted (i.e. if SPP operations adversely affect wetland function).

The following sections of the monitoring plan outline the success criteria, field methods, monitoring schedule, monitoring reports, and suggested remedial actions if adverse wetland impacts are observed and attributed to SPP operations.

Wetland Monitoring Methods

Field data will be collected from the wetlands annually to determine if success criteria are present. The data will be compared to a control wetland with similar wetland characteristics. Because the seasonal wetlands in the Sutter NWR supplement hydrology and often are flooded during the winter, Calpine proposes to use a control wetland in the Colusa National Wildlife Refuge (Colusa NWR), which only receives inundation from rainfall. A special-use permit is required from the refuge manager authorizing access to the control wetland. If the wetlands on-site retain wetland indicators after the first 5 years, it should be determined that adverse impacts from SPP operations are not occurring on-site and the frequency of monitoring should be decreased or stopped.

Success Criteria

The seasonal wetlands on-site retain wetland parameters in that they have indicators of wetland hydrology, soil, and vegetation. Wetland indicators are defined in the 1987 USACE Wetland Delineation Manual. The success criteria for this monitoring plan are identified as the presence of all three wetland indicators in remaining wetlands on site for the life of the project.

Wetland hydrology indicators include inundation and/or saturation of soils long enough to support wetland vegetation. Adverse impacts to wetland hydrology can occur when 1) a source of inundation is cut off (drainage from surrounding uplands), drained (by trenches), or re-routed, or 2) if contamination of the water prevents wetland vegetation from growing, or 3) the wetland is filled, or 4) inundation does not occur long enough to support wetland vegetation (over a period of years), or 5) the contour slopes are modified which change the drainage pattern and

direction. It should be noted that severe drought can temporarily have an affect on hydrology in a wetland but normally does not destroy a wetland. Water depth and drainage patterns will be identified during the field data collection each monitoring year (Table F-1). Observations of aquatic invertebrates and other wildlife species utilizing the wetland will be documented on the data sheets (Figures F-1).

Wetland soil indicators include presence of the underlying clay layer, low chroma, and/or concretions. Adverse impacts to wetland soils occur if 1) soils become compacted (deep tire ruts), or 2) the impermeable clay layer is punctured. Soils will be monitored for compaction from vehicles or other disturbances. Soil sample pits will be obtained and analyzed for wetland soil indicators from representative wetland types each year (Table F-1).

Wetland vegetation indicators include a predominance of plant species whose indicator status is FAC (facultative), FACW (facultative-wet), or OBL (obligate) as identified in Reed 1988. Adverse impacts to wetland vegetation occur if 1) the hydrology is absent (no inundation or saturation long enough to support wetland species), or 2) soils are modified (leveled or punctured) to where they do not retain water, or 3) contaminants from source water or weed control affect productivity. Most wetland vegetation species occurring on the SPP site may be identified during the wet season, however, some annual species may require identification in the spring (Table F-1). The dominant species (greater or equal to 20 percent relative cover) will be identified. The wetland vegetation criteria will be successful if 50 percent or more of the dominant species are FAC, FACW, and/or OBL.

Table F-1. Monitoring schedule and wetland parameters for field data collection.

Wetland Parameter	Field Data Collection Date	Data to Collect
Hydrology	January	Wetland hydrology indicators, water depth, drainage patterns, duration of inundation, use by aquatic invertebrates and other wildlife species.
Soils	January	Wetland soil indicators, disturbance of contour slopes, vehicle traffic, accumulation of salts.
Vegetation	January and possibly April	Wetland vegetation indicators, dominant plant species, percent of relative cover, indicator status of species.

Data Analysis and Monitoring Reports

The data collected during the monitoring program will be analyzed to determine if there is change in wetland indicators within the remaining wetlands on-site. Changes in wetland hydrology can be measured by a change in depth and duration of inundation. Each wetland will be evaluated for indicators of wetland hydrology, soil, and vegetation. These results will be compared to the baseline data and control wetland data to determine if there are changes in wetland function, i.e. capacity to hold water, vegetation changes from wetland to upland species.

or soil disturbance. Figures F-1 and F-2 will be used as summary sheets to document success criteria (wetland indicators) that are met for each wetland.

A monitoring report will be submitted to the CEC no later than July 31 of each year monitoring is completed.

Remedial Actions

Remedial actions are proposed remedies for adverse project impacts not initially anticipated occurring as part of the proposed project. Remedial actions that would ensure no net loss of wetlands would be implemented if adverse impacts (i.e. wetlands do not meet success criteria) occur from SPP operations. Adverse impacts could include fill of wetlands, destruction of hydrology or soil structure, or adverse water quality.

Adverse impacts are not expected to occur to wetlands remaining on-site after construction of SPP, either from operations or maintenance of the plant. However, if impacts are observed during the monitoring program and success criteria are not met, the following steps will be taken:

1. Evaluate if SPP operations are the cause of adverse impacts by a comparison to control wetlands (include analysis in annual monitoring report).
2. Contact USACE and CEC with adverse impact analysis results and possible solutions.
3. Identify if impact can be repaired immediately and/or easily with corrective measures to repair soil structure and/or contours, or enhance vegetation with plantings.
4. Continue monitoring for at least five years after adverse impact corrected.
5. If corrective actions are not possible on-site, resort to off-site remedial action, such as off-site replacement of wetland acreage in an approved mitigation bank under consultation with USACE, USFWS, and CEC.

REFERENCES

Foster Wheeler (Foster Wheeler Environmental Corporation). 1997. Wetland Delineation Report Sutter Power Plant Project, Sutter County, California. Prepared for Calpine Corporation. June.

Western (Western Area Power Administration). 1998. Biological Assessment Sutter Power Plant Project, Sutter County, California. Prepared by Foster Wheeler Environmental Corporation. April.

Reed, P.B. 1988. National list of plant species that occur in wetlands: California (Region 0). U.S. Fish and Wildlife Service Biological Report 88 (26.10). 135 pp.

Figure F-1. Wetland Monitoring Data Sheet

Project:	Date:	Page of
Survey objective:	Observer(s):	
Equipment:	Wetland ID No:	Photo No:
	Time start:	Time end:

Weather conditions: (wind direction/speed, precipitation, visibility, cloud cover, temperature)

VEGETATION

Plant Species/layer	% Relative Cover	Indicator Status	Plant Species/layer	% Relative Cover	Indicator Status

Percent Wetland Vegetation:	Is Wetland Vegetation Present?

HYDROLOGY

Wetland Indicators:
Water Depth (cm):
Duration of Inundation (days) and Source
Other Species
Is Wetland Hydrology Present?

SOILS

Wetland Indicators
Observed Disturbances
Salt Accumulation
Wetland Soils Present?

NOTES

Is Area Still a Wetland?

Figure F-2. Summary of wetland parameters for each seasonal wetland on the SPP site.

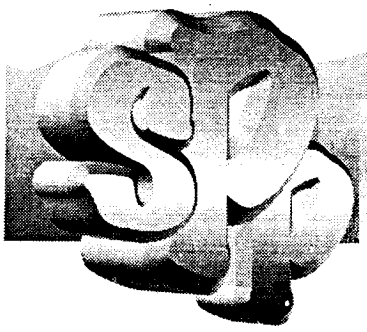
Project: Survey date:

Survey objective: Observer(s):

Wetland #	Control	1	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	21	22	23	24	25
Wetland type*																							
Vegetation met?																							
Hydrology met?																							
Soil met?																							
Changes from baseline data																							

*V=transitional vernal pool, B=borrow pit, D=seasonal depression, M=mosquito abatement pond, P=perennial pond

Notes:



Appendix C

FSA/Draft EIS Distribution List and Transmittal Letters Dated October 1998

Sierra Nevada Customer Service Region

CALIFORNIA ENERGY COMMISSION
1516 NINTH STREET
SACRAMENTO, CA 95814-5512

October 19, 1998

TO: AGENCY DISTRIBUTION LIST

REQUEST FOR AGENCY COMMENTS ON THE SUTTER POWER PLANT PROJECT

On October 19, 1998, the California Energy Commission (Energy Commission) and Western Area Power Administration (Western) filed the Final Staff Assessment (FSA)/Draft Environmental Impact Statement (Draft EIS) for the Sutter Power Plant Project (SPP). The Calpine Corporation (Calpine) is proposing to construct and operate a 500 MW natural gas fueled electric generation power plant. The proposed project is to be located about seven miles southwest of Yuba City on South Township Road near the intersection with Best Road.

To minimize duplication and regulatory delay, the Energy Commission and Western are completing a joint review and a joint California Environmental Quality Act (CEQA)/ National Environmental Policy Act (NEPA) document. The power plant and related facilities, such as the natural gas pipeline, electric transmission line and transmission switching station are under the Energy Commission's siting authority. The Energy Commission will act as lead state agency under CEQA. Since the project is also planned to interconnect to Western's transmission system, Western will act as lead federal agency under NEPA.

Sutter County is actively participating in the review of the proposed project as it will require a General Plan Amendment (GPA 97-04) and a change in the zoning (97-07). Sutter County staff has indicated that they will utilize the environmental documents produced jointly by the Energy Commission and Western as the environmental documentation for the decisions they will be making on Calpine's request for a General Plan Amendment and zoning change on their 77 acre parcel.

The FSA/Draft EIS contains the evaluation of both the construction and operation of the project. The document contains a discussion of applicable laws, ordinances, regulations and standards; a description of the project and the environmental setting; identification and discussion of the issues; an analysis of potential impacts; and recommended mitigation and conditions of certification. Commissioners Michal Moore and William Keese will be conducting publicly noticed evidentiary hearings on the project during November.

AGENCY PARTICIPATION

We request that you review the enclosed FSA/Draft EIS for the areas for which your agency would be responsible. Please provide any written comments by October 30, to Paul Richins, the Energy Commission's Project Manager (1516 Ninth Street, Sacramento, CA 95814) or Loreen McMahon, Western's Project Manager (114 Parkshore Drive, Folsom, CA 95630). You may also present your comments at the evidentiary hearings.

If you have questions or would like additional information on how to participate in the Energy Commission's review of the project, please contact Paul Richins, at (916) 654-4074, or E-mail at prichins@energy.state.ca.us. The FSA/Draft EIS, the status of the project, copies of notices and other relevant documents are also available via the Energy Commission's Internet web site at: http://www.energy.ca.gov/sitingcases/sutterpower.

Sincerely,

ROBERT L. THERKELSEN, Deputy Director for
Energy Facilities Siting & Environmental Protection

Enclosure

STATE OF CALIFORNIA — THE RESOURCES AGENCY Pete Wilson, Governor

CALIFORNIA ENERGY COMMISSION
1516 Ninth Street
Sacramento CA 95814
website:www.energy.ca.gov

STATE OF CALIFORNIA

Energy Resources Conservation and Development Commission

Notice of Availability Final Staff Assessment/Draft Environmental Impact Statement Sutter Power Plant Project Application For Certification (97-AFC-2)

On October 19, 1998, the California Energy Commission (Energy Commission) and Western Area Power Administration (Western) filed the Final Staff Assessment (FSA)/Draft Environmental Impact Statement (Draft EIS) for the Sutter Power Plant Project (SPP). The Calpine Corporation (Calpine) is proposing to construct and operate a 500 MW natural gas fueled electric generation power plant. The proposed project is to be located about seven miles southwest of Yuba City on South Township Road near Best Road.

To minimize duplication and regulatory delay, the Energy Commission and Western are completing a joint review and a joint California Environmental Quality Act (CEQA)/National Environmental Policy Act (NEPA) document. The power plant and related facilities, such as the electric transmission line, natural gas pipeline and transmission switching station, are under the Energy Commissions siting authority. The Energy Commission will act as lead state agency under CEQA. Since the project is also planned to interconnect to Western's transmission system, Western is acting as lead federal agency under NEPA.

Sutter County is actively participating in the review of the proposed project as it will require a General Plan Amendment (GPA 97-04) and a change in the zoning (97-07). Sutter County staff has indicated that they will utilize the environmental documents produced jointly by the Energy Commission and Western as the environmental documentation for the decisions they will be making on Calpine's request for a General Plan Amendment and zoning change on their 77 acre parcel.

The FSA/Draft EIS contains the environmental and engineering evaluation and analysis of both the construction and operation of the project. The

document contains a discussion of applicable laws, ordinances, regulations and standards; a description of the project and the environmental setting; identification and discussion of the issues; an analysis of potential impacts; and recommended mitigation. Commissioners Michal Moore and William Keese will be conducting publicly noticed evidentiary hearings on the project during November.

Copies of the FSA/Draft EIS are available for review at the Sutter County Community Services Department and the Sutter County Library. The entire document is also on the Energy Commission's web page (see web site address below). If you would like a copy of the FSA/Draft EIS, please fill out the enclosed form and return it to: California Energy Commission, Luz Manriquez-Uresti, 1516 Ninth Street, MS-15, Sacramento, CA 95814.

Persons wanting information on how to participate in the Energy Commission's review of the project should contact Ms. Roberta Mendonca, the Energy Commission's Public Adviser, at(916) 654-4489, or toll free in California at (800) 822-6228. Technical or project schedule questions should be directed to Paul Richins, Jr., Energy Commission Project Manager, at (916) 654-4074, or E-mail at prichins@energy.state.ca.us. The FSA/Draft EIS and other relevant documents are available on the Energy Commission's Internetweb site at: http://www.energy.ca.gov/sitingcases/sutterpower. News media inquiries should be directed to Assistant Executive Director, Claudia Chandler.

Dated: October 22, 1998

ENERGY RESOURCES
CONSERVATION AND
DEVELOPMENT COMMISSION

_____//signed//_____
ROBERT L. THERKELSON,
Deputy Director
Energy Facilities Siting &
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Mail List #709

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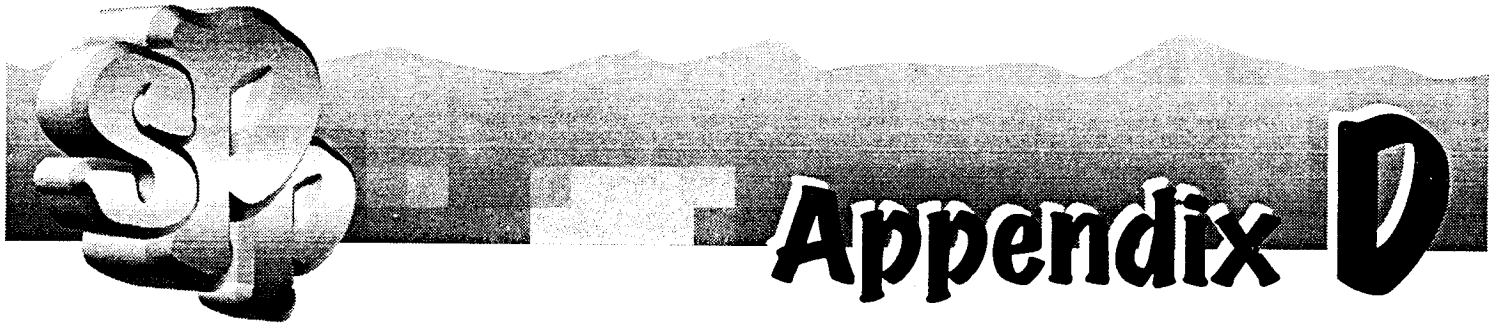
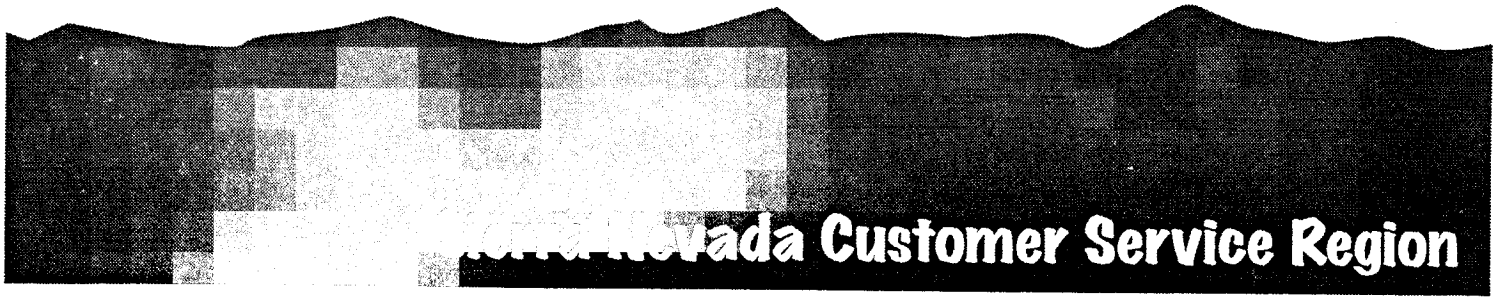


California Energy Commission Correction to the FSA/Draft EIS on Waste Management, Noise, Paleontological Resources and Transmission System Engineering; Dated Nov. 2, 1998



STATE OF CALIFORNIA—THE RESOURCES AGENCY

PETE WILSON, Governor

ALIFORNIA ENERGY COMMISSION
16 NINTH STREET
SACRAMENTO, CA 95814-5512

November 2, 1998

Corrections to the following sections of the Final Staff Assessment/Draft Environmental Impact Statement are attached:

Waste Management
Noise
Paleontological Resources
Transmission System Engineering

Calpine has agreed to these minor changes. The change in Paleontological Resources is a reflection of a production error as several pages were inadvertently dropped.

The qualifications of Al McCuen, Transmission System Engineer, are also included.

PROOF OF SERVICE [illegible]
FILED WITH [illegible] ON 11/3/98
SACRAMENTO, CA

PALEONTOLOGIC RESOURCES
Testimony of Kathryn M. Matthews

PROPOSED CONDITIONS OF CERTIFICATION

REQUIREMENTS

PAL-1 Prior to the start of project construction (defined as any construction-related vegetation clearance, ground disturbance and preparation, and site excavation activities), the project owner shall provide the California Energy Commission Compliance Project Manager (CPM) with the name(s) and qualifications of its designated paleontologic resources specialist and mitigation team members.

The designated paleontologic resources specialist shall be responsible for implementing all the Conditions of Certification and for using qualified personnel to assist him or her in project-related field surveys; monitoring; fossil stabilization, removal, and transport; data collection and mapping; direction and implementation of mitigation procedures; matrix sampling, screen washing, and other micro-fossil recovery techniques; preparation and analysis of recovered fossils and data; identification and inventory of recovered fossils; preparation of recovered fossils for delivery and curation; and report preparation.

After CPM approval of the Paleontologic Resources Monitoring and Mitigation Plan, described below in Condition PAL-4, the designated paleontologic resources specialist and team shall be available to implement the mitigation plan prior to, and throughout construction of the project.

Protocol: The project owner shall provide the CPM with a resume or statement of qualifications for its designated paleontologic resources specialist and mitigation team members. The resume(s) shall include the following information:

1) The resume for the designated paleontologic resource specialist shall demonstrate that the specialist meets the following minimum qualifications: a graduate degree in paleontology or geology, or paleo resource management; at least three years of paleontologic resource mitigation and field experience in California, including at least one year's experience leading paleontologic resource field surveys; leading site mapping and data recording; marshalling and use of equipment necessary for fossil recovery, sampling, and screen washing; leading fossil recovery operations; preparing recovered materials for analysis and

identification; recognizing the need for appropriate sampling and/or testing in the field and in the lab; directing the analyses of mapped and recovered fossil materials; completing the identification and inventory of recovered fossil materials; and the preparation of appropriate reports to be filed with the receiving curation repository, the UC Museum of Paleontology at Berkeley, all appropriate regional information center(s), and the Commission.

2) The resume for the designated paleontologic resource specialist shall include a list of specific projects the specialist has previously worked on; the role and responsibilities of the specialist for each project listed; and the names and phone numbers of contacts familiar with the specialist's work on these referenced projects.

3) If additional personnel will be assisting the designated paleontologic resources specialist in project-related field surveys, monitoring, data and fossil recovery, mapping, mitigation, fossil analysis, or report preparation, the project owner shall also provide names, addresses, and resumes for these paleo resource team members.

4) If the CPM determines that the qualifications of the proposed paleontologic resources specialist are not in concert with the above requirements, the project owner shall submit another individual's name and qualifications for consideration.

5) If the previously approved, designated paleontologic resources specialist is replaced prior to completion of project mitigation, the project owner shall obtain CPM approval of the new designated paleontologic resources specialist by submitting the name and qualifications of the proposed replacement to the CPM, at least ten (10) days prior to the termination or release of the preceding designated paleontologic resources specialist.

At least ninety (90) days prior to the start of construction on the project, the project owner shall submit the name and resume for its designated paleontologic resources specialist, to the CPM for review and approval. The CPM shall provide written approval or disapproval of the proposed paleontologic resources specialist.

Thirty (30) days prior to start of construction, the project owner shall confirm in writing to the CPM that the previously approved, designated paleontologic resources specialist and the team of assistants are prepared to implement the monitoring and mitigation measures for paleo resources, as described in the CPM-approved Paleontologic Resources Monitoring and Mitigation Plan, prepared per Condition PAL-4, below.

At least ten (10) days prior to the termination or release of a designated paleontologic resource specialist, the project owner shall obtain CPM approval of the new designated paleontologic resource specialist by submitting to the CPM the name and resume of the proposed replacement specialist.

PAL-2 Prior to the start of project construction, the project owner shall provide the designated paleontologic resource specialist and the CPM with maps and drawings for the Sutter Power Plant Project. The final center lines and right-of-way boundaries shall be provided on 7.5 minute quad maps, and the location of all the various areas where surface disturbance may be associated with project-related access roads, storage yards, laydown sites, pull sites, pump or pressure stations, switchyards, electrical tower or pole footings, etc.

Where the potential for impacts to significant paleontologic resources has been identified, the designated paleontologic resources specialist may request, and the project owner shall provide, enlargements of portions of the 7.5 minute maps presented as a sequence of strip maps for the linear facility routes. The strip maps would show post mile markers and the detailed locations of proposed access roads, storage or laydown sites, tower or pole footings, and any other areas of disturbance associated with the construction and maintenance of linear facilities.

Verification: At least ninety (90) days prior to the start of construction on the project, the project owner shall provide the designated paleontologic resource specialist and the CPM with final maps at appropriate scale(s) and drawings for all project facilities. Any request for more detailed maps by the designated paleontologic resource specialist shall also be submitted in writing to the CPM.

PAL-3 Prior to the start of project construction, the designated paleontologic resource specialist shall prepare a draft Paleontologic Resources Monitoring and Mitigation Plan to identify general and specific measures to minimize potential impacts to sensitive paleontologic resources. The CPM will review and must approve in writing, the draft Paleontologic Resources Monitoring and Mitigation Plan. After CPM approval, the project owner's designated paleontologic resource specialist and designated paleontologic resource team shall be available to implement the Monitoring and Mitigation Plan, as needed throughout project construction.

Protocol: The Paleontologic Resources Monitoring and Mitigation Plan shall include, but not be limited to, the following elements and measures:

a. A discussion of the sequence of project-related tasks, such as any final pre-project surveys, fieldwork, flagging or staking; construction monitoring; mapping and data recovery; fossil preparation and recovery; preparation for analysis, identification, and inventory; preparation of preliminary and final reports, and preparation of materials for curation.

b. An identification of the person(s) expected to assist with each of the tasks identified in a, above, and a discussion of the mitigation team leadership and organizational structure, and the inter-relationship of tasks and responsibilities.

c. Where sensitive areas are to be avoided during construction and/or operation, the designated paleontologic resource specialist shall identify measures such as flagging or fencing to prohibit or otherwise restrict access to sensitive resource areas. The discussion should address how these measures will be implemented prior to the start of construction and how long they will be needed to protect the resources from project-related effects.

d. Where monitoring of project construction activities is deemed necessary by the designated paleontologic resource specialist, the specialist will determine the size or extent of the areas where monitoring is to occur and will establish a schedule for the monitor(s) to be present. If the designated specialist determines that the likelihood of encountering fossil resources in certain areas is slight, monitoring may be discontinued in that location;

e. If fossil-bearing sediments or fossil materials are encountered on the surface or are exposed during project-related grading, augering, and/or trenching, the designated paleontologic resource specialist shall have the authority to halt or redirect construction in the immediate vicinity of the find until he or she can determine the significance of the find. The designated paleontologic resources specialist shall act in accordance with the following procedures:

- The project owner, or its designated representative, shall inform the CPM within one working day of the discovery of any potentially significant paleontologic resources and discuss the specific measure(s) proposed to mitigate potential impacts to these resources.

- The designated paleontologic resource specialist, representatives of the project owner, and the CPM shall confer within five working

days of the notification of the CPM, if necessary, to discuss any mitigation measures already implemented or proposed to be implemented and to discuss the disposition of any finds.

- All necessary and required data recovery and mitigation shall be completed as expeditiously as possible.

f. A discussion of the designated paleontologic resource specialist's access to equipment and supplies necessary for recovery of fossil materials and matrix samples. This should include information on the types and availability of specialized equipment and supplies needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits.

g. All paleontologic resource localities, rock units, and sediment and stratigraphic boundaries encountered shall be recorded (may include photos) and mapped; all vertebrate fossils and trackways, and all diagnostic invertebrate and plant fossils shall be stabilized, prepared and recovered for identification and analysis; adequate samples of potentially fossil-bearing matrix shall be collected and screen washed for sorting and analysis of micro-fossils; recovered fossil materials shall be analyzed and identified to the genus level whenever possible; and all recovered fossil materials shall be inventoried, prepared, and delivered for curation into a retrievable storage collection in a public repository or museum which meets the Society of Vertebrate Paleontologists (SVP) standards and requirements for the curation of paleontologic resources;

h. Identification of the institution that has agreed to receive any data and fossil materials recovered during project-related monitoring and mitigation work. Discussion of any requirements or specifications for materials delivered for curation and how they will be met. Also include the name and phone number of the contact person at the institution.

Verification: At least forty-five (45) days prior to the start of construction on the project, the project owner shall provide the CPM with a copy of the draft Monitoring and Mitigation Plan prepared by the designated paleontologic resource specialist. The CPM shall provide written approval or disapproval of the proposed Paleontologic Resources Monitoring and Mitigation Plan within 15 days of receipt of the submittal. If the draft plan is not approved, the project owner, the designated paleontologic resources specialist, and the CPM shall meet to discuss comments and work out necessary changes.

days of the notification of the CPM, if necessary, to discuss any mitigation measures already implemented or proposed to be implemented and to discuss the disposition of any finds.

- All necessary and required data recovery and mitigation shall be completed as expeditiously as possible.

f. A discussion of the designated paleontologic resource specialist's access to equipment and supplies necessary for recovery of fossil materials and matrix samples. This should include information on the types and availability of specialized equipment and supplies needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits.

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h. Identification of the institution that has agreed to receive any data and fossil materials recovered during project-related monitoring and mitigation work. Discussion of any requirements or specifications for materials delivered for curation and how they will be met. Also include the name and phone number of the contact person at the institution.

Verification: At least forty-five (45) days prior to the start of construction on the project, the project owner shall provide the CPM with a copy of the draft Monitoring and Mitigation Plan prepared by the designated paleontologic resource specialist. The CPM shall provide written approval or disapproval of the proposed Paleontologic Resources Monitoring and Mitigation Plan within 15 days of receipt of the submittal. If the draft plan is not approved, the project owner, the designated paleontologic resources specialist, and the CPM shall meet to discuss comments and work out necessary changes.

PAL-4 Prior to the start of project construction, the project owner shall conduct a pre-construction reconnaissance and staking in all areas expected to be affected by construction and operation of the proposed project and its associated linear facilities. The staking of the linear facilities shall use the final design, centerlines, rights-of-way, and post miles delineated in the construction drawings and maps prepared under Condition of Certification PAL-2. The designated paleontologic resources specialist will use the post mile stakes and boundary markers to identify sensitive areas with the potential to produce paleontologic resources and for implementation of specific measures, as described in Condition PAL-8, below.

Verification: A least thirty (30) days prior to the start of construction, the project owner shall complete a pre-construction reconnaissance and staking of mile-posts and right-of-way boundaries in all areas expected to be affected by construction and operation of the proposed project and its associated linear facilities.

PAL-5 Prior to the start of construction on the project, the designated paleontologic resources specialist shall prepare an employee training program. The designated paleontologic resource specialist shall submit the training program to the CPM for approval.

Protocol: The training program will discuss the potential to encounter fossil resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources.

The training shall also include the set of reporting procedures that workers are to follow if sensitive paleontologic resources are encountered during project activities. The training program will be presented by the designated paleontologic resources specialist and may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or any other areas of interest or concern.

Verification: At least thirty (30) days prior to the start of construction on the project, the project owner shall submit to the CPM for review, comment, and written approval, the proposed employee training program and set of reporting procedures the workers are to follow if paleontologic resources are encountered during project construction.

The CPM shall provide the project owner with written approval or disapproval of the employee training program and the set of procedures within 15 days of receipt of the submittal. If the draft training program is not approved, the project owner, the

designated paleontologic resources specialist, and the CPM shall meet to discuss the comments and work out necessary changes.

PAL-6 Prior to the start of construction, and throughout the project construction period as needed for all new employees, the project owner and the designated paleontologic resource specialist shall provide the CPM-approved training to all project managers, construction supervisors, and workers who operate ground disturbing equipment. The project owner and construction manager shall provide the workers with the CPM-approved set of procedures for reporting any sensitive paleontologic resources or fossil-bearing sediments that may be discovered during project-related ground disturbance.

Verification: Prior to the start of construction, and throughout the project construction period as needed for all new employees, the project owner and the designated paleontologic resources specialist shall present the CPM-approved training program on the potential for project impacts to sensitive paleontologic resources. The training shall include a set of reporting procedures for paleo resources encountered during project activities. The project owner shall provide documentation in the Monthly Compliance Report to the CPM that the employee training and the set of procedures have been provided to all project managers, construction supervisors, and to all workers.

PAL-7 Throughout the project construction period, the project owner shall provide the designated paleontologic resource specialist with a current schedule of anticipated weekly project activity and a map indicting the area(s) where construction activities will occur. The designated paleontologic resource specialist shall consult daily with the project superintendent or construction field manager to confirm the area(s) to be worked on the next day(s).

Throughout the paleontologic resources pre-construction reconnaissance, monitoring and mitigation phases of the project, the designated paleontologic resources specialist shall keep a daily log of any fossil resource finds and the progress or status of the surveys, resource monitoring, mitigation, preparation, identification, and analytical work being conducted for the project. The designated paleontologic resource specialist may informally discuss the paleo resource monitoring and mitigation activities with their Commission technical counterpart.

Verification: The project owner shall include in the Monthly Compliance Reports to the CPM, a summary of the daily logs prepared by the designated paleontologic resource specialist.

PAL-8 The designated paleontologic resource specialist shall be present at all times to monitor construction-related grading, excavation, trenching, and/or augering in areas where remnant river terrace deposits have been found. These terrace remnants have been may generally correlate with soils of the Conejo-Tisdale group and Pleistocene-age fossil materials may be present.

Project areas where the terrace deposits may be found include the power plant site, the new switchyard site, and portions of the 16-inch natural gas pipeline route and the electric transmission line route. Using the mile posts and boundary stakes placed by the project owner, the designated paleontologic resource specialist shall monitor the route of the 16-inch natural gas pipeline, between Mile Post (MP) 0.00 to MP 2.07; MP 3.58 to MP 3.70; MP 4.10 to MP 4.50. For the route of the 4.0-mile electric transmission line, areas to be monitored full-time are MP 0.00 to MP 1.40; and MP 1.80 to MP 2.60. For the route of the 5.7-mile alternative transmission line, full-time monitoring is to be done from MP 0.00 to 1.40; MP 1.80 to MP 2.60; and MP 2.80 to MP 5.20.

Other sections of the linear facility routes may be monitored as deemed necessary by the designated paleontologic resources specialist.

Verification: The project owner shall include in the Monthly Compliance Reports to the CPM, a summary of the daily logs prepared by the designated paleontologic resource specialist.

PAL-9 The project owner, through the designated paleontologic resources specialist, shall ensure the recovery, preparation for analysis, analysis, identification and inventory, the preparation for curation, and the delivery for curation of all significant paleontologic resource materials encountered and collected during pre-construction surveys and during the monitoring, data recovery, mapping, and mitigation activities related to the project.

Verification: The project owner shall maintain in its compliance files, copies of signed contracts or agreements with the designated paleontologic resource specialist and other qualified research specialists who will ensure the necessary data and fossil recovery, mapping, preparation for analysis, analysis, identification and inventory, and preparation and delivery for curation of all significant paleontologic resource materials collected during data recovery and mitigation for the project. The project owner shall keep these files available for periodic audit by the CPM.

PAL-10 The project owner shall ensure preparation of a Preliminary Paleontologic Resources Report following completion of data recovery

and site mitigation work. The preliminary report is to be prepared by the designated paleontologic resources specialist and submitted to the CPM for review, comment, and written approval.

Protocol: The preliminary report shall include (but not be limited to) preliminary information on the survey report(s), methodology, and recommendations; site records and maps; determinations of sensitivity and significance; data recovery and other mitigation activities; possible results and findings of any analysis to be conducted on recovered paleontologic resource materials and data; proposed research questions that may be answered or may have been raised by the data from the project; and an estimate of the time needed to complete the analysis of recovered fossil materials and prepare a final report.

If no fossil resources were recovered during project construction, the CPM-approved preliminary report shall also serve as the final report and shall be filed with appropriate entities, as described in conditions PAL-11 and PAL-12.

Verification: Within ninety (90) days following completion of the data recovery and site mitigation work, the project owner shall submit a copy of the Preliminary Paleontologic Resources Report to the CPM for review, comment, and written approval.

PAL-11 The project owner shall ensure preparation of a Final Paleontologic Resources Report by the designated paleontologic resources specialist, if significant fossil resources are found and recovered during project-related surveys, monitoring and mitigation.

Protocol: The final report shall include (but not be limited to) the survey report(s), methodology, and recommendations; locality records and maps; description and inventory list of recovered fossil materials; determinations of sensitivity and significance; summary of data recovery and other mitigation activities; results and findings of any special analyses conducted on recovered paleontologic resource materials and data; research questions answered or raised by the data from the project; and the name and location of the public institution receiving the recovered paleontologic resources for curation.

Verification: The project owner shall submit a copy of the draft Final Paleontologic Resources Report to the CPM for review, comment and written approval. The draft Final Paleontologic Resources Report shall be submitted to the CPM within ninety (90) days following completion of the analysis of the recovered fossil materials and preparation of text and related information, such as maps, diagrams, tables, charts, photos, etc.

PAL-12 The project owner, through the designated paleontologic resources specialist, shall submit an original, or an original-quality, copy of the CPM-approved Final Paleontologic Resources Report to the public institution receiving the recovered data and materials for curation, to the Museum of Paleontology at UC Berkeley, and to the appropriate regional information center(s). A legible copy of the approved Final paleontologic Resources Report shall be filed with the CPM, with a request for confidentiality, if needed to protect any sensitive resources or sites.

Protocol: The copies of the CPM-approved Final Report sent to the entities identified above shall include the following (as applicable to the project findings set forth in the final report): clean and reproducible original copies of all text; originals of any topographic maps showing site and resource locations, boundaries of underlying rock units and stratigraphy; original or clear copies of drawings of significant paleontologic resource materials found during pre-construction surveys, during project-related monitoring, data recovery, and mitigation; and photographs (including a set of negatives, if possible) of the locality(ies) and the various paleontologic resource materials recovered during project monitoring and mitigation and subjected to post-recovery analysis and evaluation.

Verification: The project owner shall maintain in its compliance files, copies of all documentation related to the filing of the original materials and the CPM-approved Final Paleontologic Resources Report with the public institution receiving the data and recovered materials for curation, the UC Museum of Paleontology at Berkeley, and the appropriate paleontologic information repository(ies). If no significant paleontologic resources were recorded or recovered, then the CPM-approved Preliminary Paleontologic Resources Report shall serve as the final report and is to be filed with these same entities.

PAL-13 Within thirty (30) days following filing of the Final Paleontologic Report with the appropriate entities, the project owner shall deliver for curation all paleontologic resource materials collected during data recovery and mitigation for the project. The materials shall be delivered for curation into a public repository(ies), by which the project owner has provided for delivery for curation of all the paleontologic resource materials collected during data recovery and site mitigation for the project.

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Sutter County. 1997. Sutter County General Plan Revision, Draft Environmental Impact Report; Section 4.9 Historic and Cultural Resources; published ** 1997.

Outlet Line

The outlet line to the Tudor-Murray switching station site will be a 230 kilovolt line approximately 5.7 miles long and will be a double circuit configuration operated as a single circuit design with one 1272 thousand circular mills aluminum conductor steel reinforced conductor per phase[2] (See attached Technical Terms). The line will utilize a single steel pole with davit arm and polymer suspension insulators (see Project Description Figure 4). The ruling span (distance between poles) will be 750 to 800 feet. The minimum ground clearance will be 30 feet at a 90°Centigrade conductor temperature which meets CPUC General Order No. 95 requirements. The right of way will be approximately 100 to 125 feet wide. The 1272 thousand circular mill conductor has a normal/emergency current rating of 1178/1332 amperes and at 230 kilovolts with a power factor of 0.95, the thermal rating is 446/504 megawatts, respectively. The normal conductor rating is based on a maximum conductor temperature of 80°Centigrade with a 40°Centigrade ambient. The emergency rating is based on a maximum summer conductor temperature of 88°Centigrade with a 40°Centigrade ambient[3]. The generating units produce 525 megawatts with a current of 1387 ampere which is essentially within the conductor capability when operated as a single circuit or double[4] circuit line. The Cal-ISO, Western and staff consider the 1272 conductor as the minimum conductor size acceptable for the SPP in order to reliably meet a single circuit outage criteria.

Three alternative outlet line terminations were considered by Calpine (See Alternative Section below).

Sutter Bypass Switching Station Termination

The Sutter Bypass switching station will be located at the south end of an extension of South Township Road. ~~next to the Sutter Bypass Tudor Murray switching station site.~~ The station will consist of a five breaker ring bus arranged to accommodate the two existing Western 230 kilovolt lines, the project's proposed 230 kilovolt line, and a potential future line to Western's Elverta substation. The station maximum fault current will be 17,200 amperes with the circuit breakers having an interrupting rating of 40,000 amperes. The ring bus will be designed with switches, breakers, and buswork ratings of 3,000 amperes continuous (Calpine 1997, AFC page 6-5). Staff

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[2] There will be two phase a, two phase b and two phase c conductors bused together at both the powerplant switchyard and at the Sutter Bypass switching station.

[3] Staff calculation using the EPRI TLW Workstation DYNAMP Program. Wind speed four feet per second, 104 degree Fahrenheit ambient temperature, 80 degree Centigrade maximum normal conductor temperature, 88 degree Centigrade maximum emergency conductor temperature, time 2:00 p.m., date July 8, conductor emissivity 0.9, conductor absorbtivity 1.0, latitude 40 degrees, longitude 122 degrees, incident solar flux 100 percent, line orientation north/south.

[4] Transient analysis during high temperatures (104 degrees Fahrenheit) indicate some temperature excursions above 88 degrees Centigrade but none above 90 degrees Centigrade. Staff considers the conductor as adequate for reliable operation under a single circuit outage.

Route and Switching Station Site Alternatives

Calpine initially considered two outlet/Sutter Bypass switching station alternatives for the O'Banion North switching station site, alternative A and alternative B. Alternative A would have used two, two-circuit lines which would have "looped" the existing Western Keswick and Olinda lines. This would have eliminated the Sutter Bypass switching station because the existing Western lines would have been interrupted with power flowing to the SPP switchyard and then returning on a double circuit line. This alternative was rejected by Calpine.

A second option, alternative B which would terminate on existing Western 230 kilovolt lines, was to use a single circuit 230 kilovolt, steel pole line terminated in a new Sutter Bypass switching station at the O'Banion North site. This option was originally selected by Calpine as their preferred and proposed configuration but was subsequently rejected by Calpine.

As previously discussed, a third switching station site O'Banion-South on the west or east side of the PG&E and Western lines is under evaluation by Calpine, Western and staff. It is a shorter route than the Tudor-Murray switching station site which may reduce costs. It is slightly inferior to the Tudor-Murray site from a reliability perspective because the O'Banion-South site requires undercrossing of the 500 kilovolt line which is not required for theTudor-Murray site. It is likely that the O'Banion-South site can be constructed and operated to fully meet reliability criteria and safety criteria (Personal Cons Mike DeBortoli, Oct 13, 1998)~~., however, additional information from Calpine is needed to verify this.~~ The switchyard size and design will be similar to the switching station site at the Tudor-Murray site. The decision to put the switchyard on the west as opposed to east side of the PG&E and Western lines will be made in the future and will be based partially on the potential stage II construction and operating needs (Calpine 1998q). ~~It appears that~~ There is sufficient room on both the west or east side of the 500 kilovolt and 230 kolovolt lines (Personal Cons, Mike DeBortoli, Oct 13, 1998). ~~It is anticipated that sufficient information will be available by the adjudicatory hearings to determine conformance with reliability and safety criteria and identify relative merit if appropriate.~~ The Tudor-Murray and O'Banion South site and switching station configurations ~~is~~ are considered acceptable.

Staff has identified an alternative route to the O'Banion South switching station site that would potentially reduce the visual impacts of the route along O'Banion Road. The route proceeds south from the proposed switchyard at the power plant site approximately 0.3 mile to a dirt road that runs west from South Township Road. The route then turns west and proceeds to the existing PG&E 500 kilovolt transmission line. The route then runs south parallel to the PG&E line to the O'Banion South switching station site. The route is approximately 3.8 miles long and would be substantially farther from residences and public roads than the route along South Township Road and O'Banion Road. While this route to the O'Banion South switching station site does not provide access to all of the poles, 230 kilovolt lines infrequently require maintenance. It has not been determined how close the SPP

poles could be to the existing PG&E 500 kilovolt lines. It is to be noted also that the adjacent 500 kilovolt and 230 kilovolt lines do not always have road access to the Towers. This route to the degree it parallels existing transmission facilities and could potentially share existing right or way would also comport with the siting criteria stated in Transmission System and Right of Way Planning for the 1990's and Beyond which put forth the findings pursuant to Senate Bill 2431.

These criteria include:

- TSE-Upgrades: The use of existing right of way should be encouraged by upgrading existing facilities where technically and economically feasible;
- TSE-Existing Right of Way: Expansion of existing right of way should be encouraged whenever construction of new transmission lines is required;
- TSE-New Right of Way: New right of way should be created when justified by environmental, technical, or economic reasons, as determined by the appropriate licensing agency; and
- TSE-Efficient Use of New Capacity: Agreement among all interested parties should be sought on efficient use of new transmission capacity whenever there is a need to construct such capacity.

From a transmission system engineering perspective a route that parallels the 500 kilovolt and 230 kilovolt corridor is considered feasible.

Termination Point and Facilities

Calpine considered three termination alternatives to deliver project output to the system. Alternative 1 would have been a double circuit 115 kilovolt line to the PG&E Rio Oso substation some 14 miles southeast of the SPP site. This substation is heavily loaded and could not likely accommodate the project output and was eliminated from consideration (Calpine 1997, Section 6, page 29). Alternative 2 would have terminated at Rio Oso also but with a single circuit 230 kilovolt line. This alternative was eliminated for the same reason. Alternative 3 is a single circuit 230 kilovolt line proposed to terminate at the Sutter Bypass switching station which has been previously discussed. As previously discussed, a two circuit configured line is now proposed by Calpine and would terminate in a Sutter Bypass Switching station which has provisions for additional lines for the future. From a transmission system engineering perspective staff considers the Sutter Bypass switching station at the Tudor-Murray and O'Banion South site termination acceptable. ~~.Staff anticipates receipt of sufficient additional information by the adjudicatory hearings, to make recommendations on the O'Banion South switching station sites~~

FACILITY CLOSURE

CPUC GO-95, Rule 31.6 requires that "lines or portions of lines permanently abandoned shall be removed by their owners so that such lines shall not become a public nuisance or a hazard to life or property." Condition of certification TSE-1c requires conformance in the event of closure of the SPP.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Staff concludes that the power plant switchyard, double circuit outlet line, termination point and Sutter Bypass switching stations at the O'Banion South (east and west alternatives) and at the Tudor-Murray site are acceptable. The adoption of the proposed conditions of certification will assure compliance with applicable LORS including reliability criteria.

The SPP provides significant power to the Sacramento Valley area, would help mitigate local system voltage problems and provides moderate power for load growth.

RECOMMENDATIONS

From a transmission system engineering perspective staff recommends that the Commission approve the SPP. Staff recommends that the Commission adopt the following findings and the conditions of certification, if it approves the SPP project:

- The SPP provides significant power to the Sacramento Valley area, would help mitigate local system voltage problems and provides moderate power for load growth.
- With the conditions of certification included herein the switchyard, transmission outlet line, and Sutter Bypass switching station at the Tudor-Murray and O'Banion South site will likely comply with applicable transmission system engineering LORS.

CONDITIONS OF CERTIFICATION

TSE-1 The project owner shall ensure that the design, construction and operation of the proposed transmission facilities will conform to requirements 1a through 1e listed below. The substitution of CPM approved "equivalent" equipment and equivalent switchyard configurations is acceptable.

a. The project 230 kilovolt project switchyard shall include a four circuit breaker ring bus with breaker ratings of 40,000 amperes (interrupting) and ring bus, switches, breakers and buswork rated at 2,000 ampere continuous.

b. An approximately 4 or 5.7 mile double circuit configuration line operated as a single circuit 230 kilovolt line using steel pole construction with conductors sized at a minimum of 1272 thousand circular mill Aluminum Conductor Steel Reinforced shall be constructed to the O'Banion South or Tudor-Murray Sutter Bypass switching station site, respectively.

Albert A. McCuen

SENIOR ELECTRICAL ENGINEER

Education

A.S., Electronic Engineering. College of the Siskiyous, Weed, CA
B.S., Electrical Engineering, California State University, CA

Professional Background

1990 to present

Senior Transmission Planner for Regulatory Transmission Engineering, Electrical Engineering, and Transmission System Evaluation. Special consultant for Transmission Safety and Nuisance discipline.

1987 to 1989
Supervisor of Transmission Evaluation Unit for Transmission Safety and Nuisance, Electrical Engineering, Transmission Engineering and Transmission System Evaluation technical disciplines.

1978 to 1987
Transmission System Program Specialist/Health and Safety Program Specialist, California Energy Commission (CEC), Siting and Environmental Division.

Expert witness for the Commission's power plant approval process and Commission staff transmission planner. Major assignments in transmission engineering and transmission system planning. Duties emphasize determination of the adequacy, acceptability and relative merit of applicant proposals for major transmission facilities (and staff proposed alternatives) in consideration of economics, reliability, conformance with transmission system planning criteria and coordination of regional transmission and generation facilities. Major assignments have also included scoping macro transmission policies for California, Developing Commission transmission system planning regulations and guidelines, developing common forecasting methodology for transmission system planning utility reporting.

1977 - 1978
Manager, Transmission Line Effects Section, CEC, Compliance and Safety Office.

Research, analysis and evaluation of public heath, safety and nuisance concerns for transmission lines. Duties included engineering calculations of transmission line electrical effects, review and assessment of technical publications and health, safety and nuisance standards.

1976 - 1977
Energy Facility Siting Planner, CEC, Compliance and Safety Office

Research and evaluation of existing material and health and safety standards applicable to thermal power plants and transmission lines. Responsible for coordination of expert witness to testify at hearings, preparation of cross examination questions, analysis of impact of effects and preparation of staff summary reports on Notice of Intent(s) and hearing testimony.

1969 - 1976
Electrical Engineering. Private firm - Electrical, Mechanical and Systems Engineering Construction Contractor

Engineering duties and coordination responsibilities for the construction of power plants, switchyards, power lines, industrial buildings and process control systems. Responsible for code and specification interpretation and compliance, design, project cost estimates and installation.

ERRATA - WASTE MANAGEMENT

CONDITIONS OF CERTIFICATION

WASTE-1 The project owner shall obtain a hazardous waste generator identification number and hazardous waste treatment permits for neutralization facilities ~~and oil water separator(s)~~ from the Department of Toxic Substances Control prior to generating any hazardous waste.

Verification: The project owner shall keep copies of the identification number and permits on file at the project site and notify the CPM via the monthly compliance report of their receipt.

TO: Paul Richins
FROM: Steve Baker
DATE: October 29, 1998
SUBJECT: Sutter FSA - Noise Changes

Please make the following changes to Noise CofC-6, per our 10/28/98 conference call with Calpine and my communications today with George Carpenter:

NOISE-6 Upon the project first achieving an output of 80 percent or greater of rated capacity, the project owner shall conduct a 25-hour community noise survey, utilizing the same monitoring sites employed in the pre-project ambient noise survey as a minimum. The survey shall also include the octave band pressure levels to ensure that no new pure-tone noise components have been introduced. ~~No single piece of equipment shall be allowed to stand out as a dominant source of noise that draws complaints.~~ If the results from the survey indicate that operation of the power plant causes noise levels in excess of 45 dBA (l_{eq}) measured at the ~~property line of the~~ nearest residence, additional mitigation measures shall be implemented to reduce noise to a level of compliance with this limit. No single piece of equipment shall be allowed to stand out as a dominant source of noise.

Verification: Within 30 days after first achieving an output of 80 percent or greater of rated output, the project owner shall conduct the above described noise survey. Within 30 days after completing the survey, the project owner shall submit a summary report of the survey to the Sutter County Community Services Department and the CPM. Included in the report will be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limits, and a schedule, subject to CPM approval, for implementing these measures. Within 30 days of completion of installation of these measures, the project owner shall submit to the CPM a summary report of a new noise survey, performed as described above and showing compliance with this condition.

Appendix 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

Sierra Nevada Customer Service Region

SUTTER COUNTY

COMMUNITY SERVICES DEPARTMENT

Animal Control
Building Inspection
Emergency Services
Fire Services
Planning
Environmental Health

Rich Hall, Director
Larry Bagley, Assistant Director
Permitting Services
Gary Kraus, Assistant Director
Fire & Emergency Services

Post-it® Fax Note 7671	Date 11/12/98	# of pages ▶ 16
To Curtis Hildebrand	From George Carpenter	
Co./Dept. Calpine	Co. Sutter Co.	
Phone #	Phone # 530 822 7400	
Fax # (408) 995-5158	Fax #	

November 12, 1998

To: Sutter County Planning Commission

Re: Agenda Item #6: Public hearing on General Plan Amendment #97-04 to change the land use designation from Ag-20 and Ag-80 to Industrial; and

Agenda Item #7: Public hearing on Rezoning #97-07 to change the zoning of the subject property from AG (General Agricultural) District to M-2 PD (General Industrial, Combining Planned Development) District and to establish a development plan, including criteria of development for a power plant facility; located on the west side of South Township Road, south of Best Road, Yuba City; A.P. #21-230-025; applicant - Calpine Corporation/property owner - Calpine Greenleaf Holdings, Inc. (Location: District 5 - Commissioner Michel)

Current Proposal

A. Project Description:

The Calpine Corporation (Calpine) proposes to construct and operate a 500 megawatt (MW) natural gas fueled, combined cycle, electric generation facility. The new facility would be located directly west of the existing Greenleaf 1 power plant. Due to the size of the plant, Calpine is required to secure approval from the California Energy Commission. In addition to the application submitted to the state, Calpine has requested to amend the General Plan land use designation of the subject property from Ag-20 and Ag-80 to Industrial and has requested to change the zoning district of the property from AG to M-2 PD. As part of the zoning change the applicant is requesting establishment of a Planned Development District which would allow the construction and operation of the proposed power plant.

As part of this project, Calpine proposes to construct a new 4-mile 230 kilovolt (kV) overhead transmission line which would be routed from the project site south along the west side of South Township Road to O'Banion Road, then west along the south side of O'Banion Road to a switching station which would be constructed on the property immediately east of the Sutter Bypass levee on the south side of O'Banion Road. The switching station site would consist of approximately two acres.

Calpine has also proposed to construct a new 16-inch natural gas pipeline from a PG&E natural gas pipeline in western Sutter County (near the intersection of Meridian and Girdner Road) to the plant site. The gas line would be placed in county road rights-of-way, generally following Oswald Road. Through the bypass, the line would be placed along or under Hughes Road. The pipeline would be placed underneath the levees.

The transmission lines, switching station and gas lines are not included as part of the rezone and general plan amendment applications per se, because they come under the siting authority of the California Energy Commission, and no use permit or other local entitlement is necessary.

B. Environmental Consideration:

Under the California Environmental Quality Act (CEQA) and the Guidelines, the Energy Commission is the lead agency and Sutter County is a responsible agency for environmental review. As the lead agency, the Energy Commission through its staff, has prepared a Final Staff Assessment (sent to you on October 25, 1998), which acts as the functional equivalent of a draft environmental impact report (EIR). The Final Staff Assessment (FSA) represents the Energy Commission staff's review of the feasibility of the project, an evaluation of the potential environmental impacts, and an assessment of the project's compliance with local laws, ordinances, regulations and standards.

The FSA is broken down into various technical areas which assess the potential environmental impacts. Specifically, they are: air quality, public health, worker safety and fire protection, transmission line safety and nuisance, hazardous materials management, waste management, land use, traffic and transportation, noise, visual resources, cultural resources, socioeconomic resources, biological resources, soil and water resources, and paleontological resources. Additionally, the FSA addresses the power plant itself including the design, reliability, efficiency, monitoring and closure.

Background

A. Property Description:

The subject property, approximately 77 acres in size, is located southwest of the intersection of Best Road and South Township Road. The east portion of the property is currently developed with the Greenleaf 1, which consists of a 49.5 MW cogeneration plant and ancillary storage and office buildings. The west half of the site, which is proposed for development is currently not developed nor is it farmed.

B. Surrounding Land Use, Zoning District and General Plan Designation:

	Use	Zoning	General Plan
Subject Property	Power plant facility	AG	Ag-20/Ag-80
North	Residence/field crop	AG	Ag-80
East	Orchard	AG	Ag-20/Ag-80
South	Field crop	AG	Ag-20/Ag-80
West	Field crop	AG	Ag-80

C. Previous Planning Commission Actions:

In 1984, the Planning Commission approved Use Permit No. 1201 to allow the construction and operation of a 49.5 MW power plant based on a finding that the plant was consistent with the County General Plan by allowing full development of natural resources located in the County. In 1986, the project had not been constructed, so the applicant resubmitted the application. It was again approved (Use Permit No. 1392) based on the same finding. Use Permit No. 1392 was approved subject to a number of conditions which were intended to address biological, noise and traffic impacts of the project.

Staff Comments

A. Planning Staff:

Staff's comments in this section pertain to the main issues raised during the review of this project by the Energy Commission and County staff. The subject matter areas below include either a general discussion of the concern and/or potential mitigations, conditions and monitoring. This section does not address every issue raised during public comment process on the preparation of the Final Staff Assessment; it would be redundant since the issues are also discussed in the FSA and the amendments to it. Page references below are to the FSA unless otherwise specified.

1. Air Quality

The FSA is incomplete because the regulatory agencies involved in reviewing the air quality impacts have not yet completed their review. In particular, the Feather River Air Quality Management District (FRAQMD) has not completed their Final Determination of Compliance, in which the District will indicate whether it believes that the proposal complies with the applicable air quality standards. This document is expected to be published the week of November 9, 1998. After it is published, the Energy Commission staff is expected to complete their staff assessment on air quality and publish their proposed conditions of certification. This document is expected to be published November 16, 1998 and will be provided to the Planning Commission before the November 18, 1998 hearing.

2. Noise

The Sutter County General Plan sets a policy for noise levels for new projects. Specifically, Policy 8.A-2 limits noise levels during daytime to 50 dB (hourly L_{eq}) and during the nighttime to 45 dB (hourly L_{eq}). The FSA concludes that the noise control measures to be implemented by Calpine will be sufficient to allow the project to be quiet enough to meet the 45 dB standard. As a way to monitor the noise mitigations proposed by Calpine, the FSA suggests condition Noise-6 (page 238) which will require Calpine to conduct a noise survey that demonstrates that the facility is meeting the standard required by the General Plan. The recommended language of the condition of Noise-6 has been modified from the way it reads in the FSA. Originally, the FSA indicated that the standard should be met at the property line of the nearest residence. However, County staff reads the language of Policy 8.A-2 to require the measurement to be made at the nearest noise sensitive receptor (i.e. the nearest residence) instead of the property line of the nearest residence. Staff's reasoning was based on the fact that there is no specific language in the policies indicating where the measurements are to be taken. Absent specific language, we looked to the intent which was to protect the residents of the area, and they mostly live in and around their homes, not at the property lines, particularly in an agricultural area where property lines can be several hundred to thousands of feet from a home.

In the case of this project, there is an approximate 2,000-foot difference between the two. Accordingly, the Energy Commission staff amended its recommendation based on County input, and the revision is reflected in the supplement to FSA forwarded to the Planning Commission by memorandum dated November 12, 1998.

3. Soil and Water Resources

Originally, Calpine proposed to operate a water-cooled plant which would have required two wells pumping approximately 3,000 gallons per minute (gpm) to supply the facility with the 4.336 million gallons per day needed to cool the system. In order to address concerns raised by neighbors and staff and to mitigate the potential effect of the project on ground water supply and quality, Calpine amended the project to use 100 percent dry cooling technology. This reduced the water supply needs by 95 percent, from approximately 3,000 gpm to 140 gpm.

County and Energy Commission staff also identified a potential issue with respect to additional storm water runoff generated by the proposed development. The area of the project already suffers from localized flooding during heavy storm events and neighbors and staff are concerned that the additional impervious surface proposed would increase the problem. In order to address this concern, the Energy Commission staff, after working with County staff, developed recommended condition "SOIL&WATER-6" which requires Calpine to: 1) provide for on-site storm water retention; and 2) prepare a report of the potential impacts of project runoff on downstream storm water facilities, including verification of coordination with public and private entities that own or maintain facilities downstream from the project. The FSA originally contained language requiring "approval of all public and private entities." The language was changed when it was determined that it would be inappropriate to give private entities "approval" authority over the project.

4. Visual Resources

Visual resources is the only area in which the FSA indicates that there is a significant impact. Although numerous mitigations are proposed, such as using dry cooling to eliminate the cooling tower plume, painting the facility to reduce its obtrusive view, and landscaping around the entire site to screen views from residents, Energy Commission staff indicates that impacts will still result from both the transmission lines and power poles and from the plant itself.

County staff does not necessarily agree with the conclusion reached by the Energy Commission staff that the project will result in a significant visual impact. The concern is twofold. First, the methodology used to determine substantial impact appears overly subjective. Specifically, there is no information to determine what constitutes a small, moderate or high impact on viewers. There are approximately 10 homes in the area which will have clear views of the power plant. There are an additional nine homes with partial views of the plant facility; most having limited views due to existing orchards and landscaping surrounding the homes. Most of the views to the power plant from adjacent roads have views obstructed by existing orchards and power lines. When a clear view from roadways exists it is only for a short duration. The longest duration of view to the power plant is driving north on South Township, which is a two-mile stretch. The views to the Sutter Buttes, the County's most predominant land feature, will be affected for about one mile of this two-mile stretch. Additionally, all local roads with views of the plant facility have limited daily traffic when compared to alternative sites evaluated below. Only 2 or 3 homes would have their view of the Sutter Buttes further affected by the plant facility and transmission lines. It should be noted that these homes already have some view obstruction to the Sutter Buttes. Based on this level of visual exposure, staff does not believe a substantial impact on visual resources exists.

Secondly, the Environmental Impact Report prepared for the County-wide General Plan concluded that development along the Highway 20 -Sutter Industrial Park would create only *potentially* significant impacts. This area has much greater vehicular traffic (6,000-10,000 vehicle trips per day on Highway 20 versus 113 on South Township Road and 129 on O'Banion Road) and has many more residents whose view of the Sutter Buttes may be affected. The conclusion in the FSA would be inconsistent with the conclusions reached in the General Plan EIR. This is particularly true when considering that a power plant and power lines already exist in the area and have some effect on views to both the Sutter Buttes and general landscape. Additionally, Condition of Certification VIS-4 requires a landscape screen around the power plant which will reduce visual impacts created by the power plant. Staff will include an overhead illustrating the photo simulation of the landscape screen. Because of the higher HRSG stacks and cooling tower of the proposed project, some residents would see more of the facility than they currently do. But County staff does not believe this is a significant impact.

5. Alternatives

As required by CEQA, the FSA examines the feasibility of available site and facility alternatives to the applicant's proposal which substantially lessen the significant adverse

impacts of the proposal on the environment. The FSA evaluated industrial sites in Sutter County south of the Sutter Buttes, in the City of Yuba City, and in the South Sutter County Industrial/Commercial Reserve and agricultural sites in other locations of the County. As well as sites outside of Sutter County.

Each of these sites encountered their own constraints, which led none of them to be a preferred alternative. The site south of the Sutter Buttes would have been in direct conflict with the General Plan policy which requires that new development along Highway 20 to be designed to protect views of the Buttes. The 145-foot stacks and air cooled condenser would have made this standard nearly impossible to meet.

The sites in Yuba City were dropped from consideration because of the city's 60-foot height restriction and the proximity of the industrial area to medium and high density residential.

The site in the South Sutter County Industrial Commercial Reserve faced problems with its proximity to residential uses and the potential adverse visual impacts because of the site's visibility from Highway 99. The site was also not considered as a preferred alternative because it did not have access to proper public facilities (i.e. sewer, water, storm drainage) as required by the General Plan for development in that portion of the County.

Other agricultural sites were considered, and in fact the site of the proposed switching yard (located at on the property immediately east of the Sutter Bypass levee on the south side of O'Banion Road) was determined to be a preferred alternative, until it was discovered that the site was currently under cultivation. County staff does not favor these alternative sites due to the conflict with the General Plan policies that discourage the conversion of agricultural land to non-agricultural uses, as indicated below under the "Land Use" discussion.

6. Compliance Monitoring

The Energy Commission has an elaborate compliance program to ensure that all of the conditions of the new facility are satisfied. The program provides a process where citizens may request that the Commission conduct investigations into alleged non-compliance with the terms and conditions of the certification. If there is a significant failure to comply with the terms or conditions of the certification, the Energy Commission has the authority to revoke the certification or impose civil penalties.

7. Traffic and Transportation

The Community Services Department continues to receive complaints regarding the truck traffic going to and from the existing Greenleaf One facility. At the center of the dispute is the language of condition #14 of Use Permit No. 1392 which reads: "Truck traffic shall be directed to use State Highway 99, Oswald Road and Township Road as access routes to the site when feasible." The use of the language "when feasible" provides difficulty in enforcing the route specified as a mandatory route because the definition of when it is feasible is subjective.

Since the County is considering an application to establish a planned development plan for the entire site, this is an appropriate time to address traffic-related issues for the existing plant. As part of the new project, Calpine has offered to use Highway 20 to George Washington Boulevard to Oswald Road to South Township Road and Highway 99 to Oswald Road to South Township Road as the routes for truck traffic to and from the project site. For consistency and to avoid future confusion, planning staff recommends that the language included in Condition #14 of Use Permit No. 1392 be modified so that all traffic going to Greenleaf 1 and the Sutter Power Project use the same. Accordingly, a language modification is included below in the Criteria of Development.

8. Land Use

Calpine has requested a rezone and general plan amendment. These applications are needed by the applicant as part of their licensing application to the Energy Commission. Under the Warren-Alquist Act, the Energy Commission has jurisdiction over the proposed power plant and all related facilities. Accordingly, their issuance of a license supersedes the county's authority to approve or deny the project. However, the Energy Commission must make findings concerning whether the proposed project conforms with state and local laws and ordinances, including land use plans and zoning ordinances. If the County were to deny the applications for rezone and general plan amendment, making the facility not consistent with the local land use plans and ordinances, then the Energy Commission could either approve the project if it finds that the "facility is required for public convenience and necessity and that there are not more prudent and feasible means of achieving such public convenience and necessity" or deny the project because it is inconsistent with local regulations.

Below is County staff's assessment of the land use implications of the General Plan Amendment and rezone applications and the proposed locations of the transmission lines.

a. General Plan Amendment

A change in the General Plan land use designation must be evaluated for its consistency with the policies of the General Plan to ensure that an internal inconsistency is not created by the proposed change. The FSA includes a review of the "Project's Conformity with the Sutter County General Plan." The review, completed with the assistance of County staff, indicates each of the applicable policies and discusses their applicability and whether the project will conform to them (pages 200-203).

Because the project includes a request to change the General Plan land use designation from Ag-20/Ag-80 to Industrial, this project has the potential to conflict with General Plan policy 6.A-1 which reads:

6.A-1 The County shall preserve agriculturally-designated areas for agricultural uses and direct non-agricultural development to areas designated for urban/suburban growth, or rural communities and/or cities.

Recognizing that there may be situations in which some limited agricultural land conversion is needed, the General Plan included Implementation Program 6.3. Pursuant to this program, the Board of Supervisors adopted "Criteria for Agricultural Land Conversion" which were to be used for determining the appropriateness of conversion of agricultural land. These criteria were not intended to be the determining factor whether agricultural land should be converted, but instead they were to be a tool for developers and staff to use for assessing the probability of future application approval. The criteria represent information to be provided to decision makers for consideration when reviewing a project.

The Energy Commission staff evaluated the project for its consistency with the criteria and the score indicated that the project site was not a good candidate for agricultural land conversion. On August 7, 1998, County planning staff wrote a letter to the Energy Commission staff indicating that the criteria were not applicable in this case because the project did not include a conversion of agricultural land to suburban and urban uses. Contrary to statements by the Energy Commission staff in the land use section of the FSA (see page B-3 of Exhibit B of the memorandum dated November 12, 1998 regarding supplemental FSA material), the project site was converted to urban/industrial use in 1984 when the Planning Commission approved Use Permit No. 1201 for the existing facility based on the finding that the project was " . . . consistent with the General Plan by allowing full development of natural resources located in the county." Regardless of whether the land use designation of the site was changed by the project approval, the project site was no longer used for agricultural production, instead the primary use became energy production. If approved, the current project, which is an expansion of an existing industrial use, would merely assign a land use designation consistent with the current usage.

Concerns have been raised that approval of this project could be a catalyst for future development in this area. However, Planning staff does not share the concern for two reasons. First, while the Criteria for Conversion of Agricultural Land does not apply to the Calpine project (as explained above), the Criteria would apply to any proposal for development on adjacent agricultural land which is under production and has not yet been converted to non-agricultural use. Application of the Criteria to any of the parcels in the area would reveal that none of them are good candidates for conversion for future development. The second reason is that staff is recommending that Calpine grant to Sutter County the development rights and an open area easement on the portion of the site that is not proposed for development. Such a grant would prevent Calpine and future owners of the land from developing any more of the project site beyond what is approved as part of this request, unless the agreement was rescinded by a resolution adopted by the Board of Supervisors.

b. Rezone

The applicant has requested a change to the M-2 PD (General Industrial, Combining Planned Development) District. The County's Planned Development overlay district allows the Planning Commission (or Board of Supervisors) to establish criteria and standards for development of each specific parcel to allow the type of development

proposed. Proposals for planned developments are evaluated for their conformance to the base zoning district and for their consistency with the County General Plan.

For a zone change to be approved with a development plan, the proposed uses must be consistent with the base zoning district (i.e. Is a power plant permitted in the M-2 District?). Under the Zoning Code in effect at the time the applications were submitted, there were no provisions in any zoning district to allow for a electric generation facilities providing regional electric supply. However, the M-2 District allowed, with a use permit, all "[l]awful uses not otherwise provided for . . . " in the Zoning Code. The Sutter County Zoning Code in effect on November 13, 1998 allows, with a use permit, uses which are determined by the Community Services Department Director to be compatible and in character with the intent of the District. The Community Services Department Director has determined that this use is in character with the intent of the M-2 District and therefore the facility may be approved with a use permit.

A rezone must be consistent with the General Plan. Since the application requests a zone change to an M-2 PD District, the General Plan land use designation must be changed to Industrial (IND) for the project to maintain consistency. The discussion under the "General Plan" subheading above discusses this projects consistency with the General Plan. To achieve the goal of minimizing conflicts between agricultural and non-agricultural uses, the applicant has submitted a site plan for the proposed development of the site which shows the existing facility located on the east side of the site, the proposed facility located on the west side of the site, which has been designed to include maximum buffering from adjacent agricultural land.

If the Planning Commission supports the applications in its recommendation to the Board of Supervisors, then planning staff suggests that it include the recommended criteria below which includes by reference the 100+ proposed conditions of certification.

c. Transmission Line Route Consistency with the General Plan

The transmission lines are not included as part of the general plan amendment and rezoning applications. The Sutter County Zoning Code permits transmission lines subject to use permit approval. Since the Energy Commission's certification of a site and its related facilities supersedes the County's authority to issue permits, a use permit is not needed. However, since the transmission line is a foreseeable consequence of the project, it must be evaluated for its impacts to the environment and for its consistency with the local land use ordinances and regulations.

Three different transmission line routes have been discussed; they are:

Route #1 South down the west side South Township Road to Tudor Road, then, either continuing straight south to the switching station at the Sutter Bypass or turning west at that point and heading to Murray Road and

then south to the switching station at the Bypass. This route is referred to in the FSA as the "proposed route."

Route #2 South down the west side of South Township Road to O'Banion Road, then west along the south side of O'Banion to the switching station on the south side of O'Banion Road at the Sutter Bypass. This has been referred to as the "mitigation route."

Route #3 South from the plant site .3 miles to a private dirt road, then west along the road to its end and continuing beyond that point to the PG&E 500kV transmission line, then south along the east side of the PG&E transmission line. This was the latest route alternative analyzed by the Energy Commission staff and rejected after the workshop on November 4, 1998.

The discussion of Route #1 which is found on pages 196-199 indicates that the impact from the transmission lines will have the potential to impact agricultural operations but the impacts will not be significant. Route #2 is discussed on pages 205-208, under the "Mitigation" heading, where the FSA concludes that Route #2 will have less impacts on agriculture than Route #1 and that it will not have a significant impact on agricultural resources.

Following the discussion of Route #2, on page 207 there is a discussion indicating that Route #3, identified by the Energy Commission staff, is a preferred route because Route #2 has significant visual impacts and because Route #3 will have less of an impact to agriculture. Following the workshop on November 4, 1998, the Energy Commission staff withdrew their recommendation for Route #3 being a preferred alternative.

Planning staff recommends below that you recommend to the Board of Supervisors that they approve the project. We would point out that this recommendation is consistent with our previous recommendations where we have supported the expansion of existing businesses in the agricultural areas where the proposed expanded businesses' original approvals were found to be consistent with the General Plan and where we believed that the findings for approval could be made on the subsequent request. Recently, County staff supported applications from Valley Farm Transport and Woodland Nut Company to expand their existing facilities. In each case the projects were originally approved under use permit found to be consistent with the General Plan. The subsequent applications which were both considered by the Planning Commission and both approved by the Board of Supervisors were supported by staff after we concluded that each of the projects were consistent with the General Plan.

Recommended Action

A Recommend to the Board of Supervisors that it approve General Plan Amendment No. 97-04 and Rezone No. 97-07, adopt the attached site plan as the development plan for the site, subject to the following criteria of development:

Criteria of Development

Limitations of Use

1. Use of the area not under the jurisdiction of the California Energy Commission shall be consistent with Use Permit No. 1392, including Conditions 1 through 19 (attached), as approved by the Planning Commission in 1986, except as modified below. The portion of the site under the jurisdiction of the Energy Commission shall be consistent with the site plan, the project description in the Final Staff Assessment, and the conditions of certification.

2. Condition #14 of Use Permit No. 1392 shall be amended to read as follows:

   All project traffic, to and from the site, shall use State Highway 99 to Oswald Road to South Township Road to the site or shall use State Highway 20 to George Washington Boulevard to Oswald Road to South Township Road to the site. Use of any other route to and from the site shall not be consistent with this development plan.

3. Prior to issuance of a building permit for construction, the project owner shall grant to Sutter County the development rights and an open area easement on the portion of the site that is not proposed for development. The grant shall preclude Calpine and future owners of the land from expanding the facility beyond the 16-acre area of the footprint and its related facilities (e.g. drainage facilities, evaporation pond) approved as part of this request, unless the agreement is rescinded by a resolution adopted by the Board of Supervisors.

4. The conditions of certification at the end of each of the technical sections of the Final Staff Assessment and the amendments thereto shall serve as the criteria of development for this project. (Staff note: A summary of the conditions will be provided at the meeting for quick reference.)

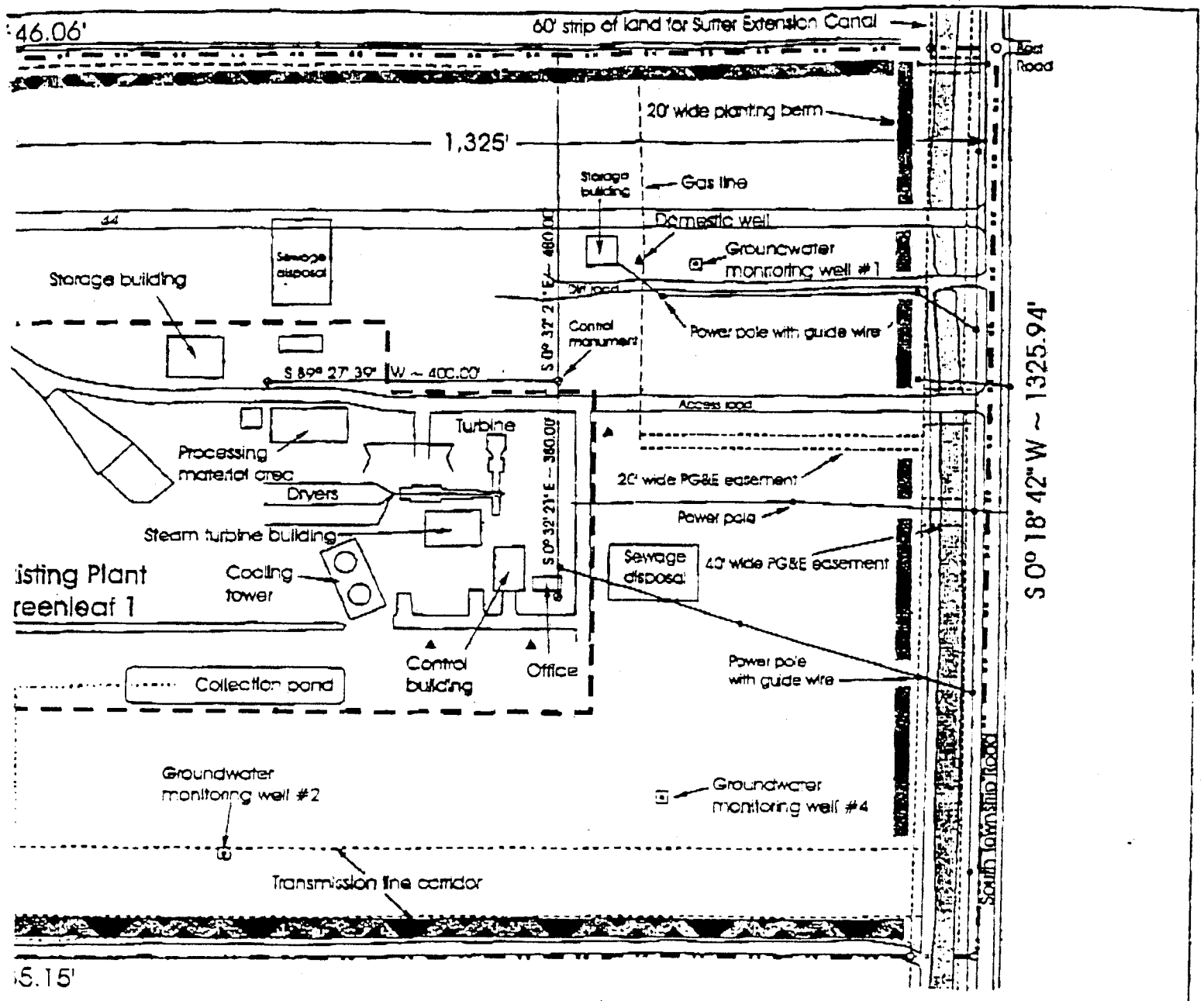
Sincerely,

THOMAS A. LAST
PLANNING DIVISION CHIEF

George M. Carpenter, Jr.
Associate Planner

Attachments: Exhibit A - Study Sketch
Exhibit B - Site Plan
Exhibit C - Conditions of Approval (Use Permit #1392)

OSWALD
RD.
PG&E SUB STA.
ROAD
BLVD
A-G
PIERCE
RD
2ND
STORE
A-G
WASHINGTON
DEHYDRATOR
SC COMMUNITY SERV
BEST
RD.
GREENLEAF COGENERATION FACILITY
A-G
EXHIBIT A
SUBJECT SITE
TOWNSHIP
GEORGE
NORTH



30. Waste Treatment Basin
31. Evaporation System
32. Brine Holding Tank
33. Crystallizer W/ Sunsahde and Dumpster

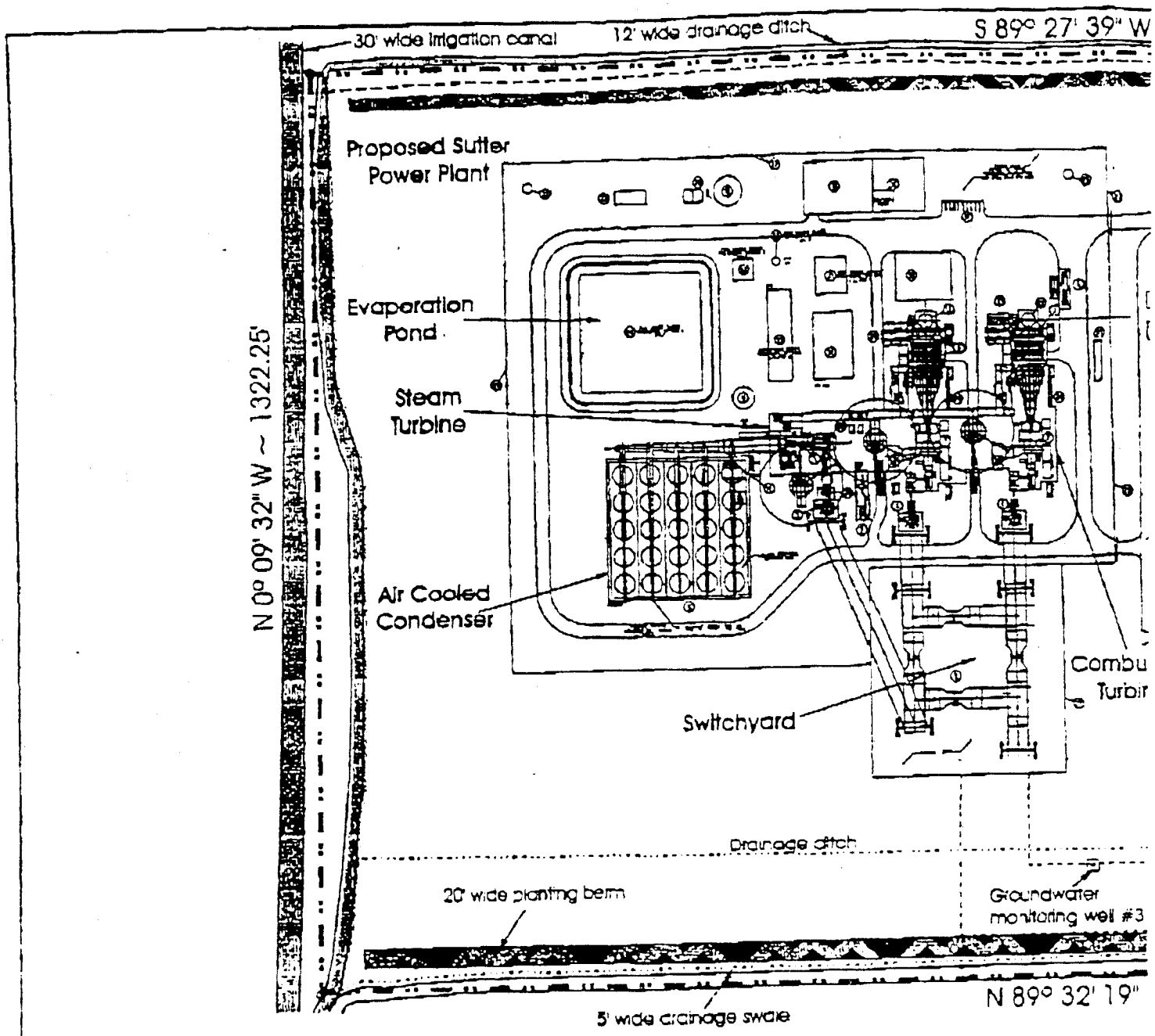
= Planting berm

SUTTER POWER PLANT PROJECT

PLANNED SITE ARRANGEMENT

FOSTER WHEELER ENVIRONMENTAL

EXHIBIT B



Key to Proposed F

1. Steam Turbine
2. Combustion Turbine
3. H.R.S.G., By Owner
4. C.T. Main Transformer
5. S.T. Main Transformer
6. Ammonia Unloading/Storage Area
7. Switchgear Building W/ Battery Room
8. Switchyard
9. Air Cooled Condenser
10. C.T. Air Inlet Filter, By Owner
11. Condensate Collection Tank
12. Demineralized Water Storage Tank
13. Stack, By Owner
14. Fin Fan Cooler
15. Warehouse / Maintenance Shop
16. Administration Building
17. Parking
18. Water Treatment Build
19. Raw/Fire Water Storag
20. Compressed Air Equip
21. Boiler Feedwater Pum
21a. Boiler Feedwater Pur
22. Sewage Treatment Pa
23. Water Well
24. Rotor Air Cooler, By O
25. Gas Metering Station,
26. Firewater Pumphouse
27. Fence
28. Unit Aux. / Station Ser
29. Evaporation Pond

CONDITIONS OF APPROVAL
USE PERMIT #1392 - GREENLEAF POWER CORP.
February 5, 1986

1. The project shall be developed in substantial conformance with the application submitted, including all data identified in the Environmental Information Document.

2. Encroachment permits shall be obtained from the Public Works Department for any new driveway approaches for the project and for any work done in the public right-of-way, including pipeline construction.

3. All necessary rights-of-way and street improvements as required by the Public Works Department shall be provided within the limits of this project.

4. A drainage plan for the project shall be approved by the Public Works Department.

5. All necessary permits shall be obtained from the Sutter County Air Quality Control Officer.

6. A waste water discharge permit shall be obtained from the Water Quality Control Board.

7. Upon completion and operation of the plant, if found necessary, a noise assessment shall be conducted at the nearby residences and sound attenuation measures shall be provided to reduce any noise associated with the plant operation to a level not to exceed 45 dba within the residences.

8. A Steambed Alteration Agreement shall be obtained from the Department of Fish and Game.

9. The location and timing of the construction of the pipeline in the Sutter Wildlife Refuge shall be coordinated with the U.S. Department of Interior, Fish and Game Service, to minimize distruption of wildlife in the area.

10. All necessary permits shall be obtained from the Reclamation Board for crossing of the levees and the Sutter By-Pass.

11. All necessary permits shall be obtained from the Health Department for the locations of wells and septic tank/leach field installation.

12. Solid waste removal shall be accomplished in accordance with the requirements of the Health Department.

EXHIBIT C-1

13. Any toxic wastes, solvents and/or petroleum wastes shall be disposed of in accordance with the requirements of the Health Department.

14. Truck traffic shall be directed to use State Highway 99, Oswald Road and Township Road as access routes to the site when feasible.

15. If archeological or historic artifacts or other such material are discovered at the site during construction, an archeologist shall conduct a survey of the site and determine what measures must be taken to protect any such materials prior to continued construction on the site. As an alternative, an archeological survey may be conducted on the site prior to start of construction and any archeological or historical data shall be preserved as required.

16. All necessary permits shall be obtained from the Sutter Extension Water District for discharge of water to their facilities.

17. A grading plan for the wood chip storage areas shall be approved by the Health Department.

18. All solid and liquid wastes shall be disposed of in accordance with a plan approved by the Health Department.

19. Applicant shall obtain a non-community water system permit and provide water sample results as required by the Health Department.

EXHIBIT C-2

Appendix J

Calpine Corporation's Biological Resources Mitigation Implementation Plan; Dated Dec. 1998

Sierra Nevada Customer Service Region

Final Draft

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION PLAN

for the

SUTTER POWER PLANT PROJECT
SUTTER COUNTY, CALIFORNIA

Prepared for:

Calpine Corporation
San Jose, California

Prepared by:

FOSTER WHEELER ENVIRONMENTAL CORPORATION
Sacramento, California

December 1998

CONTENTS

FIGURES

TABLES

1.0 INTRODUCTION

1.1 Background

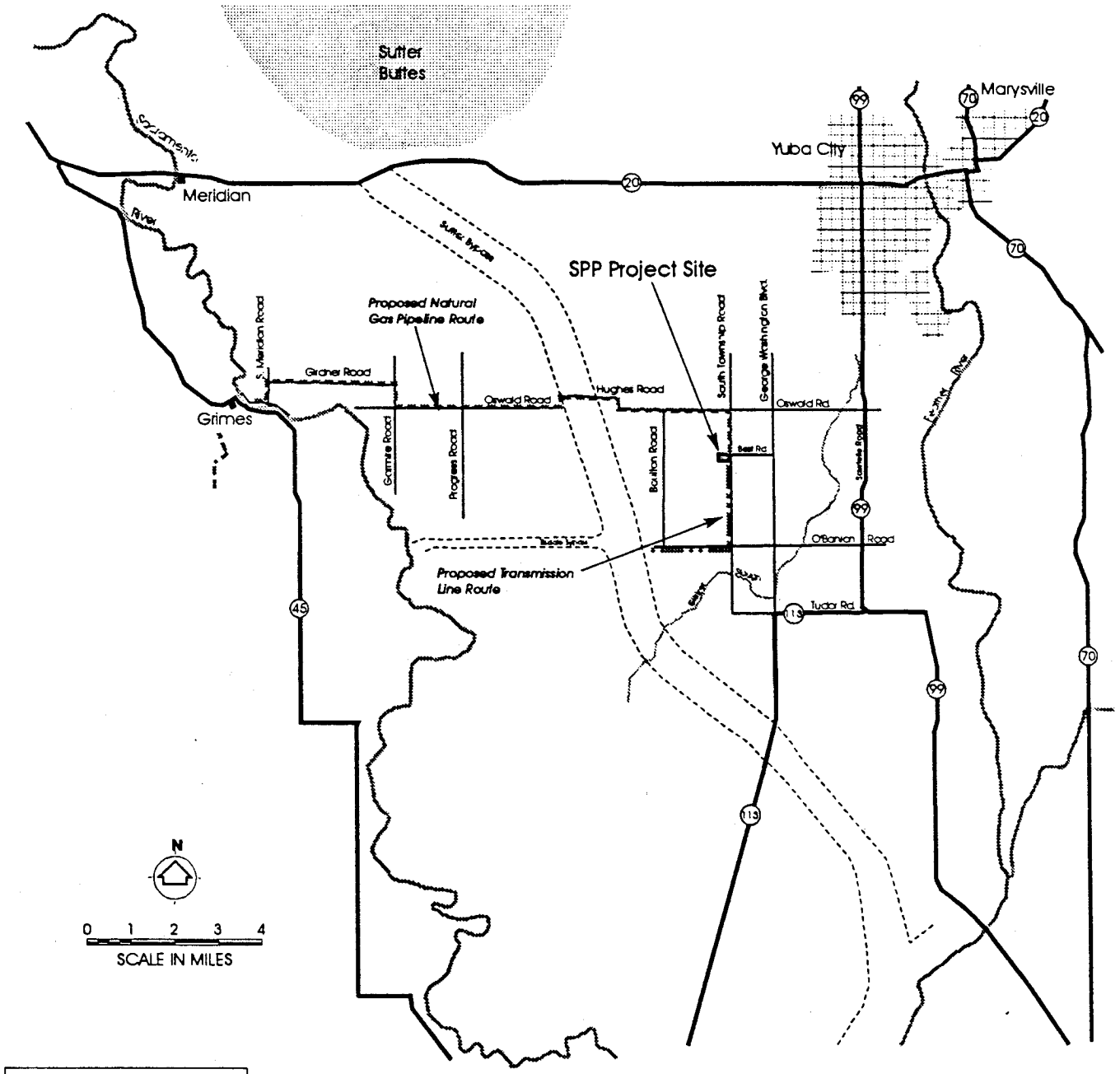
Calpine Corporation (Calpine) plans to construct and operate a 500-MW gas-fired merchant power plant in central Sutter County, California approximately 7 miles southwest of Yuba City (Figure 1). Sutter Power Plant (SPP), the proposed project, will be built adjacent to Calpine's existing 49.5-MW Greenleaf 1 cogeneration facility. The current cogeneration facility occupies 12 acres of Calpine's 77-acre parcel on South Township Road. Calpine is expected to begin construction of the SPP in the second quarter of 1999 and will require approximately 16.0 acres of land for the SPP footprint. Habitats within the proposed footprint and access road include seasonal wetlands and disturbed annual grassland. The proposed SPP project consists of gas combustion turbines, zero discharge dry cooling towers, Heat Recovery Steam Generator (HRSG) emission stacks, operations buildings, and asphalt parking lots.

Ancillary facilities to the SPP include 14.9 miles of Pacific Gas and Electric (PG&E) natural gas pipeline and 4.0 miles of a 230-kV Western Area Power Administration (Western) electric transmission lines and a 2.2-acre switchyard to connect the SPP facility to existing utility lines (Figure 2). Expansion of two natural gas dehydrator stations in Sutter and Colusa counties is also part of the project.

The project site is bordered on the east by South Township Road, and on the north, west, and south sides by irrigated rice fields. Orchards dominate the land areas east of South Township Road and rice fields are dominant west of South Township Road to the Sutter Bypass. Access to the project site is from South Township Road.

The natural gas pipeline is proposed to run north on South Township Road, west along Oswald Road, north on Garmire Road, west on Girdner Road, south on South Meridian Road, and west to the dehydrator station on the east side of the Sacramento River. The gas pipeline will cross the Sutter Bypass and the Sutter National Wildlife Refuge (Sutter NWR) within the 100-foot-wide county road easement of Hughes Road.

The electric transmission line is proposed to run south along South Township Road from the SPP site and west on O' Banion Road to tie into the proposed switchyard south of O'Banion Road at the east levee of the Sutter Bypass (Figure 2). Transmission line poles are proposed to follow county roads.



LOCATION MAP

LEGEND

- Plant site
- Proposed transmission line route
- Proposed gas pipeline route

FIGURE 1

SUTTER POWER PLANT PROJECT

PROPOSED SUTTER POWER PLANT LOCATION MAP

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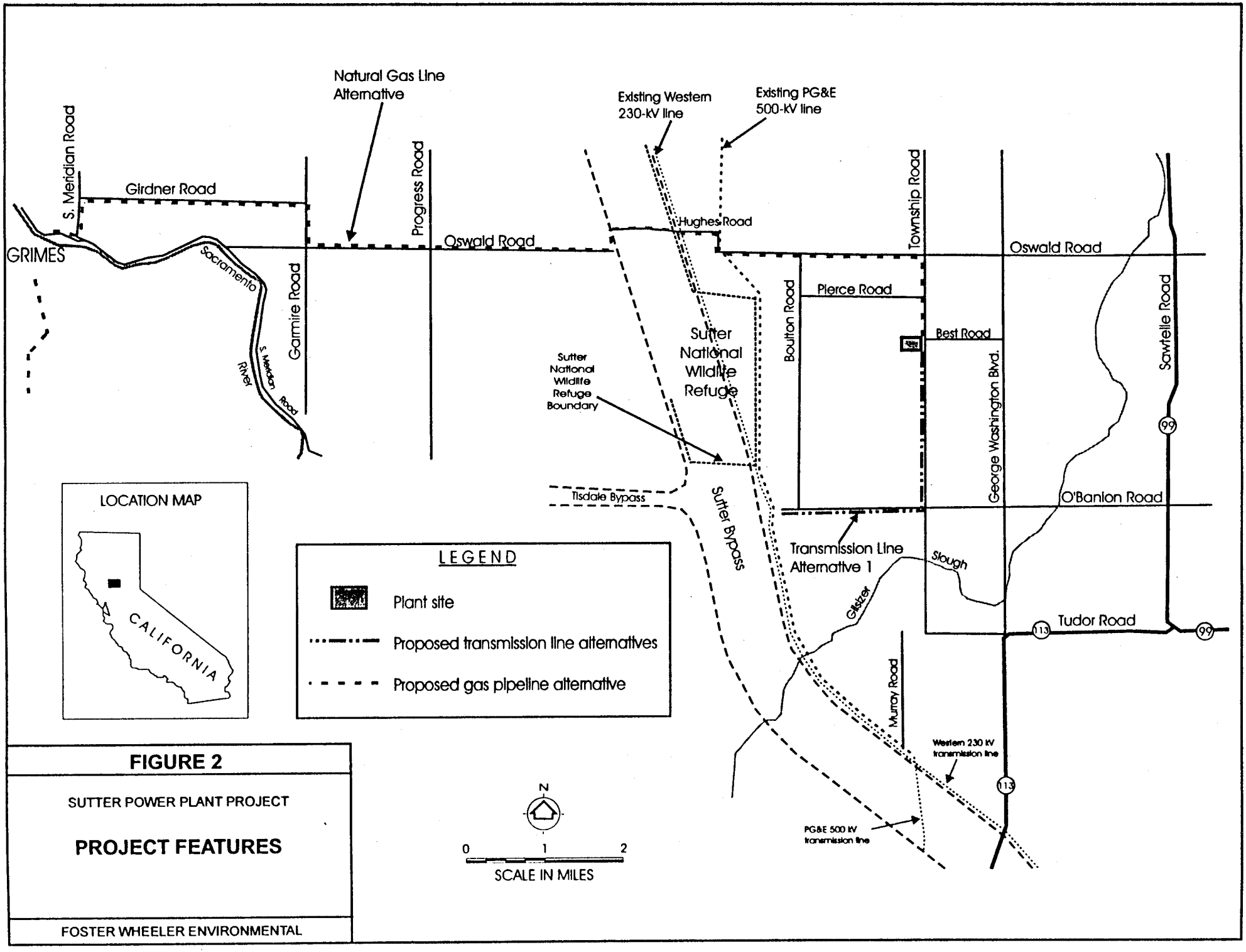


FIGURE 2

SUTTER POWER PLANT PROJECT

PROJECT FEATURES

FOSTER WHEELER ENVIRONMENTAL

A gas gathering system will be upgraded along Poundstone Road south of Grimes in Colusa County. This proposed gas pipeline route is west of the Sacramento River in an agricultural area. The proposed location of the SPP project site and ancillary facilities is shown in Figure 2. The physical location is described as follows:

SPP project site:	Sutter County Gilsizer Slough Quadrangle Township 14N, Range 2E, ¼ NE, ¼ NE
Natural gas pipeline route:	Extends west onto Tisdale Weir and Grimes Quadrangles in Sutter and Colusa counties.
Electric transmission line route:	Gilsizer Slough Quadrangle.

1.2 Project Impacts

Construction of the SPP facility and ancillary facilities will result in the loss of natural habitats in the project area. A total of 19.137 acres of habitat will be lost permanently to construction: 16.737 acres of annual grassland, 2.2 acres of rice, 0.1 acre of wheat, 0.1 acre of mature walnut orchard, and 3.0 acres of seasonal wetlands (although 5.83 acres will be mitigated for temporary construction impacts). Approximately 6 acres of disturbed grassland habitat (primarily on irrigation canal berms) will be temporarily disturbed during construction of the gas pipeline and electric transmission line poles.

Operation of the SPP could result in avian collisions with the new electric transmission line and HRSG stacks.

Maintenance of the SPP and Greenleaf 1 facility grounds currently includes annual disking. This activity reduces wetland vegetation productivity and potentially could result in the harm of giant garter snakes that may use the site for forage.

1.3 Purpose of the BRMIP

Calpine evaluated project impacts to biological resources as part of the AFC process. Calpine modified the project design to avoid sensitive biological resources to the furthest extent feasible. Mitigation measures were developed to minimize unavoidable project impacts. The Biological Resource Mitigation Implementation Plan (BRMIP) describes how Calpine will implement the mitigation measures developed to assure any action authorized, funded, or carried out by state or federal lead agencies is not likely to jeopardize the continued existence of endangered or threatened species. Western is the lead Federal agency and the CEC is the lead state agency for SPP project regulatory

compliance and licensing. Western will have oversight of the mitigation measures set forth by the USFWS and NMFS and require Calpine to adhere to the terms and conditions of the Incidental Take Statement in the Biological Opinions. Western will prepare a Mitigation Action Plan (MAP) outlining the implementation measures that will be used to show compliance with Federal laws and/or mitigation measures. The contents of a MAP is comparable to the BRMIP. The CEC will have oversight of the mitigation set forth by the CDFG Memorandum of Understanding and will also oversee federal mitigation requirements.

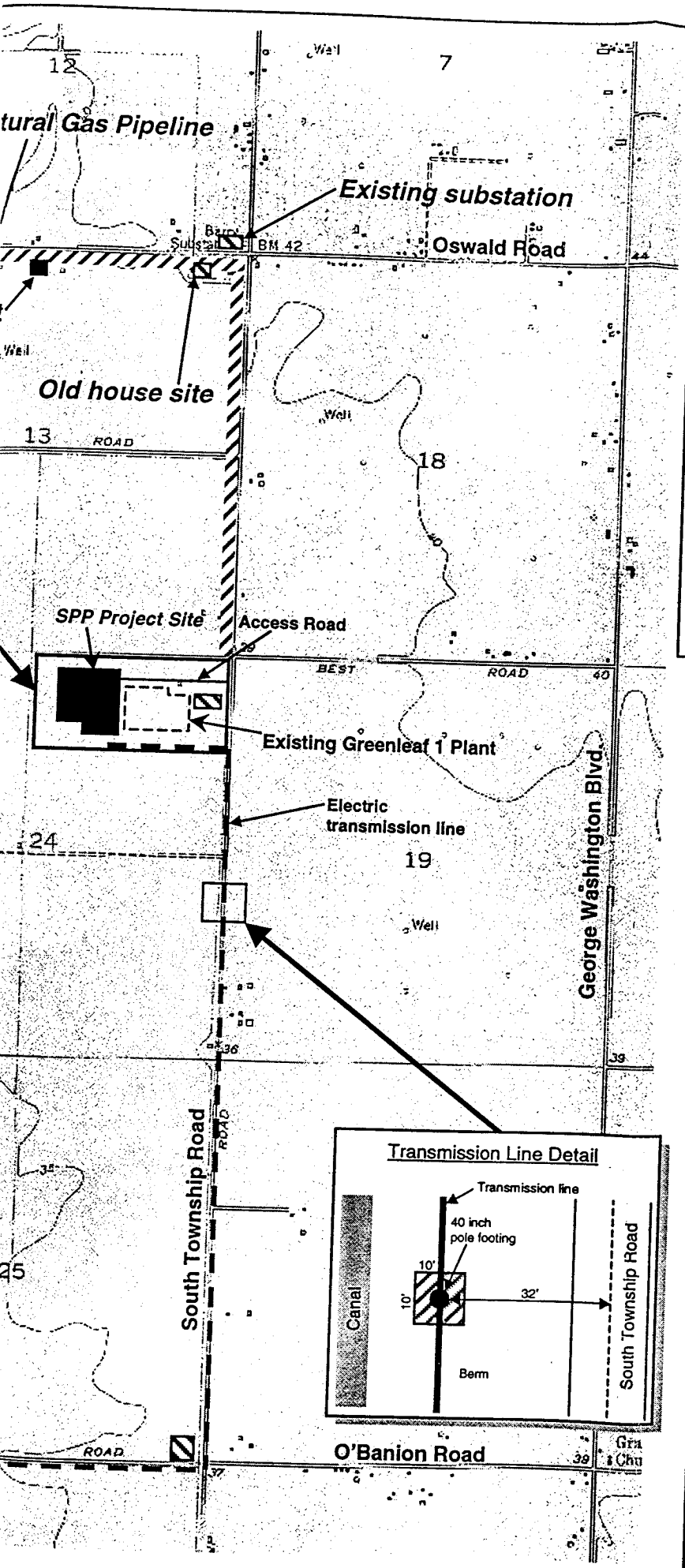
The purpose of the BRMIP is to provide a scope of mitigation measures and guidance for implementation of the mitigation measures developed to protect biological resources in the SPP project area. These measures apply to all temporary and permanent construction areas identified as the Implementation Areas (Figure 3). Calpine's employees and contractors will adhere to these measures during construction, operation, and maintenance of the proposed SPP, natural gas pipeline, and electric transmission line under direction and advice of the designated biologist. The mitigation measures are envisioned to fulfill the requirements of the Conditions of Certification in the CEC Final Staff Assessment (FSA) and other natural resource agencies. The Final BRMIP will include any conditions identified by the natural resources regulatory agencies as defined in Section 5.0 and Appendix H.

2.0 DESIGNATED BIOLOGIST

Calpine will designate a biologist who meets the qualifications outlined in the CEC Preliminary Staff Assessment (PSA) for the SPP (Appendix A). The designated biologist will conduct a worker education program, supervise implementation of the mitigation measures, consult with CEC, and advise project construction workers if there are changes in the proposed plans. The designated biologist will have the authority to stop work if project proponents do not follow the BRMIP. The designated biologist will submit monthly and annual reports to the CEC that document the results of the BRMIP measures.

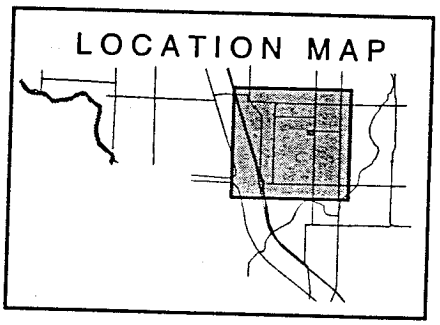
3.0 IMPLEMENTATION AREAS

The implementation areas include those land areas that will be permanently or temporarily disturbed during construction, operation, and maintenance of the SPP facility, natural gas pipeline, electric transmission line, switchyard, and dehydrator stations. The mitigation measures developed for the SPP project will be enforced within



LEGEND

- Proposed temporary laydown/staging/storage area and electric transmission line pull sites (to be revegetated if possible)
- Transmission line route
- May require Streambed Alteration Agreement (401 permit)
- Waterway flow direction
- Bore location
- Permanent impact area
- Temporary impact area (to be revegetated)
- Chinook salmon, CV steelhead, Sacramento splittail



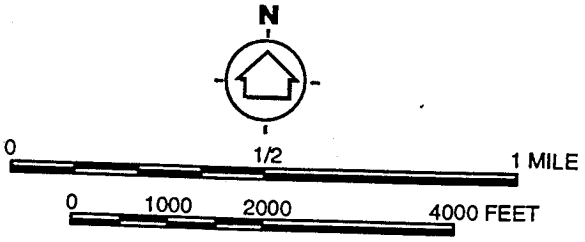
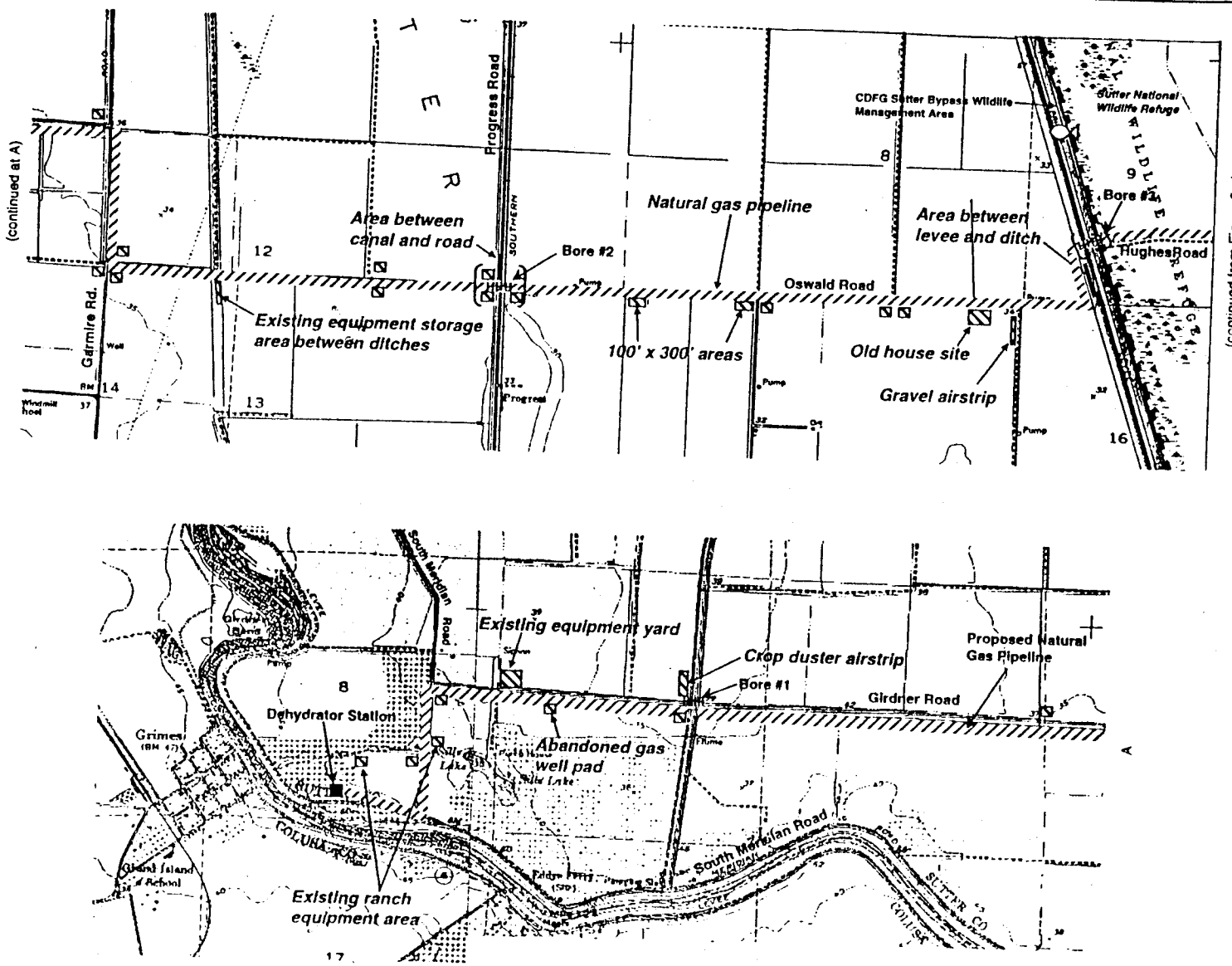


FIGURE 3a

SUTTER POWER PLANT PROJECT

MITIGATION IMPLEMENTATION AREAS



LEGEND

- Proposed temporary laydown/staging/storage area
- May require Streambed Alteration Agreement (401 permit)
- Permanent impact area
- Temporary impact area (to be revegetated where possible)
- Bore location
- Chinook salmon, CV steelhead, Sacramento splittail

LOCATION MAP

N

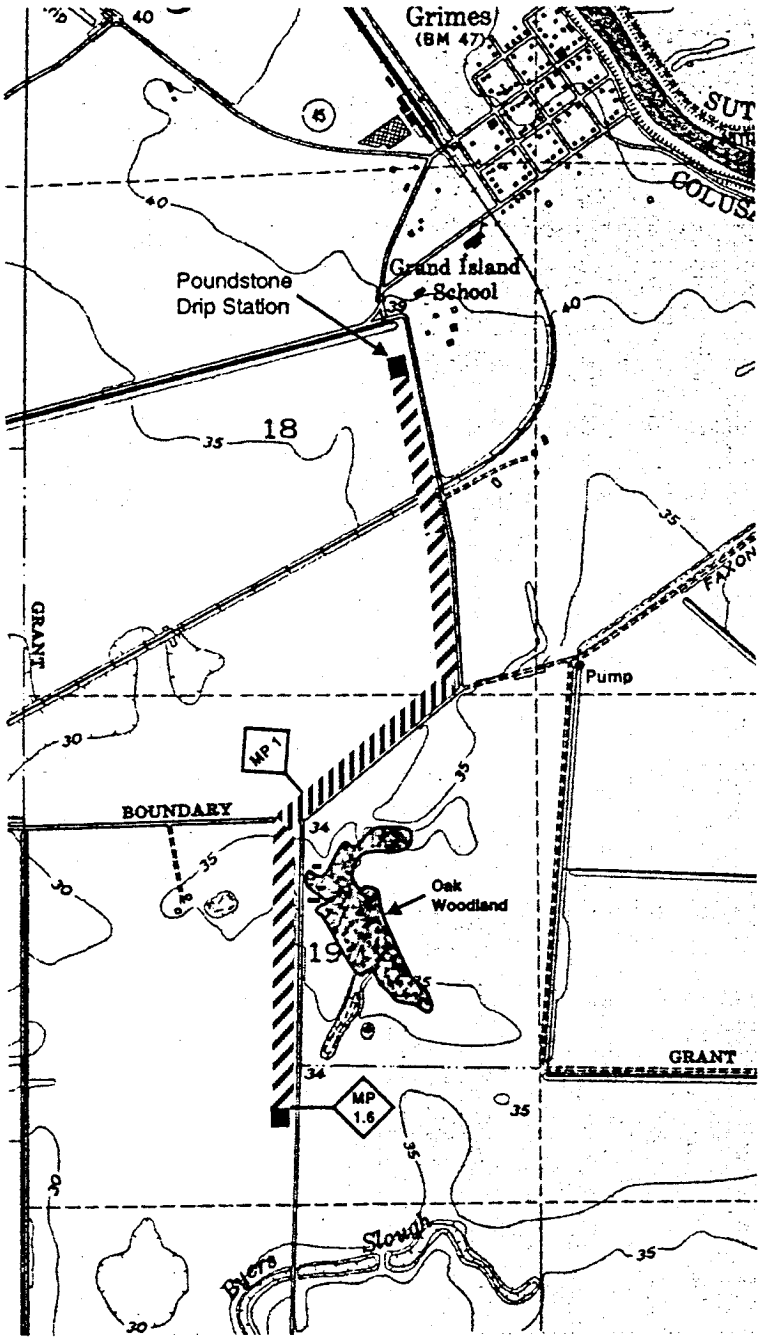
0 1/2 1 MILE

0 1000 2000 4000 FEET

FIGURE 3b

SUTTER POWER PLANT PROJECT

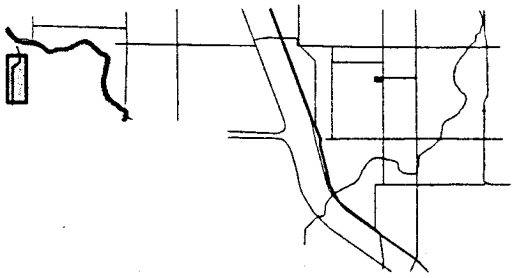
MITIGATION IMPLEMENT/ ARE



LEGEND

- Proposed temporary laydown / staging / storage area
- Milepost
- Permanent impact area
- Temporary impact area

LOCATION MAP



N

0 1/2 1 MILE

0 1000 2000 4000 FEET

SCALE: 1" = 2,000'

FIGURE 3c

SUTTER POWER PLANT PROJECT

MITIGATION IMPLEMENTATION AREAS

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the implementation areas. Figures 3a through 3c show the areas of permanent and temporary project impacts, revegetation areas, avoidance areas, areas requiring a Streambed Alteration Agreement or waiver, or a Department of the Army Section 401 of the Clean Water Act permit.

4.0 SENSITIVE BIOLOGICAL RESOURCES WITHIN THE IMPLEMENTATION AREAS

Special-status species that could occur in the SPP project area and vicinity were identified by the United States Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), CDFG, and from field surveys conducted during the impact analysis for the AFC. Wetlands within the project area were delineated and verified under the United States Army Corps of Engineers (USACE) wetland delineation procedure.

A detailed description of sensitive biological resources present within the SPP project areas is included in the AFC. Sensitive biological resources requiring mitigation from SPP project impacts include:

1. **Swainson's hawk** (*Buteo swainsoni*) is a California threatened species that nests along the Sutter Bypass, Sacramento River, and large isolated trees along farm roads from March through September. They forage for prey in crop fields and grassland habitats. Most Swainson's hawks winter in Central and South America. Swainson's hawks are sensitive to loss of forage and nesting areas and may therefore abandon nests if disturbed by construction activities. They are also vulnerable to collisions with electric transmission lines.

2. **Giant garter snake** (*Thamnophis gigas*) is a Federal and California threatened species, live year-round in the irrigation canals, rice fields, Gilsizer Slough, and marshes of the Sutter NWR. They spend most of their time in or very near water, where they forage for fish and frogs. Giant garter snakes hibernate in animal burrows above floodwaters from October through April. Giant garter snakes are sensitive to loss of habitat and are vulnerable to earth moving construction equipment, especially during hibernation.

3. **Waterfowl and migratory birds** (geese, ducks, herons, shorebirds, cranes, etc.) use the Pacific Flyway, as a major winter migration route. The bald eagle (*Haliaeetus leucocephalus*), a Federal threatened and California endangered species, forages

along the Sacramento River and flooded rice fields in the winter. The peregrine falcon (*Falco peregrinus anatum*), a Federal and California endangered species, the greater sandhill crane (*Crus canadensis tabida*), a California threatened species, and the Aluetian Canada goose (*Branta canadensis leucopareia*), a Federal threatened species, spend winters foraging in the Central Valley and have been observed in the project area. The American bittern (*Botaurus lentiginosus*), a Federal species of concern, and other herons and egrets forage in the rice fields and irrigation canals. Waterfowl and migratory birds are vulnerable to collisions with electric transmission lines.

4. **Salmon, steelhead, and splittail** occur in the Sutter Bypass. The Sutter Bypass is used during migration by adult spring- and fall-run chinook salmon (*Oncorhynchus tshawytscha*), proposed as Federal endangered and Federal threatened, respectively. The Central Valley steelhead (*Oncorhynchus mykiss*), proposed as Federal threatened, also migrates through the Sutter Bypass to spawning grounds. Juvenile salmon and steelhead use the bypass as rearing habitat on the way to the Pacific Ocean. The Sutter Bypass contains spawning habitat for Sacramento splittail (*Pogonichthys macrolepidotus*), a proposed threatened species. Fish in the Sutter Bypass are vulnerable to sedimentation from construction activities inside the banks and to adverse changes in water quality.

5. **Seasonal wetlands** occur on the SPP project site and in the Sutter NWR. The wetlands on site hold water only during the winter and dry up during the summer. They can be difficult to differentiate when dry. Wildlife, especially waterfowl and shorebirds, use wetlands as feeding areas during the winter. Seasonal wetlands can lose their functionality when soils become compacted or plowed, as this prevents rainwater from ponding and changes the hydrologic regime of the wetland.

5.0 CONDITIONS OF CERTIFICATION

Conditions of Certification of the SPP will be provided in the following environmental documents from the natural resource agencies and the CEC.

- California Energy Commission (CEC) Preliminary and Final Staff Assessments and Final Decision,
- United States Fish and Wildlife Service (USFWS) Biological Opinion (BO),
- United States Army Corps of Engineers' (USACE) Clean Water Act Section 404 Wetland Permit,

- National Marine Fisheries Service (NMFS) Biological Opinion (BO),
- California Department of Fish and Game's (CDFG) Memorandum of Understanding (MOU) under Section 2081 of the Fish and Game Code,
- CDFG Streambed Alteration Agreement or Waiver, and
- California Regional Water Quality Control Board (CRWQCB) Clean Water Act Section 401 Water Quality Certification.

The following table presents the conditions each agency requires of Calpine to ensure SPP project impacts to biological resources will not jeopardize the continued existence of endangered or threatened species.

Table 1. Biological Resources Conditions of Certification from Natural Resource Agencies for the Sutter Power Plant Project.

Agency	Condition		Responsible Party	Authorization or Permit
CEC	BIO-1	Provide CEC approved Designated Biologist with qualifications outlined in PSA.	Calpine	Final Decision
CEC	BIO-2	Advise project proponents of biological resources conditions of certification, monitor implementation of mitigation measures, and notify CEC CPM of non-compliance.	Calpine and Designated Biologist	Final Decision
CEC	BIO-3	Halt work if necessary to avoid non-compliance, tell project owner when to resume construction, and advise CPM of corrective actions required.	Calpine and Designated Biologist	Final Decision
CEC	BIO-4	Prepare and implement a Worker Environmental Awareness Program for each worker on-site.	Calpine and Designated Biologist	Final Decision
CEC	BIO-5	Enter into an Endangered Species Memorandum of Understanding (MOU) with CDFG and implement the terms of the agreement.	Calpine and Designated Biologist	Final Decision

Agency	Condition		Responsible Party	Authorization or Permit
CEC	BIO-6	Provide copies of the Biological Opinions from the USFWS and NMFS and implement the terms of the agreement.	Calpine and Designated Biologist	Final Decision
CEC	BIO-7	Obtain a Streambed Alteration Agreement or waiver from CDFG for construction in waterways.	Calpine and Designated Biologist	Final Decision
CEC	BIO-8	Implement giant garter snake mitigation measures before and during construction.	Calpine and Designated Biologist	Final Decision
CEC	BIO-9	Implement Swainson's hawk mitigation measures before and during construction.	Calpine and Designated Biologist	Final Decision
CEC	BIO-10	Implement measures to mitigate or avoid adverse project impacts to migratory birds and monitor avian collisions after construction of transmission line and HRSG stacks.	Calpine and Designated Biologist	Final Decision
CEC	BIO-11	Implement measures to mitigate or avoid adverse project impacts to wetlands and monitor functionality after construction of SPP.	Calpine and Designated Biologist	Final Decision
CEC	BIO-12	Prepare and submit a Biological Resources Mitigation Implementation Plan (BRMIP).	Calpine and Designated Biologist	Final Decision
CEC	BIO-13	Provide a fund for mitigation credits that include habitat compensation, monitoring, and management before construction begins.	Calpine	Final Decision
USFWS			Western and Calpine	Biological Opinion
NMFS			Western and Calpine	Biological Opinion
USACE			Western and Calpine	404 Permit

Agency	Condition		Responsible Party	Authorization or Permit
CDFG			CEC and Calpine	MOU Streambed Alteration Agreement Waiver
CRWQB				Water Quality Certification

(Summary of conditions from Appendix H will be included in Table 1 when available from the natural resource agencies)

6.0 MITIGATION MEASURES

Calpine developed mitigation measures in coordination with the CDFG, USFWS, NMFS, USACE, and CEC to minimize unavoidable project impacts to biological resources in the SPP project area. Table 2 presents the mitigation measures developed for each potential project impact that could affect sensitive biological resources. Mitigation measures for the SPP project include:

- Construction mitigation monitoring by designated biologist
- Worker environmental awareness training
- Construction zone limits
- Preconstruction surveys
- Timing restrictions on construction
- Modify project design: operations and maintenance
- Habitat compensation
- Erosion control and revegetation of disturbed areas
- Monitoring plans and reports

Table 2. Permanent and temporary project impacts from SPP construction, operation, and maintenance activities and proposed mitigation measures to minimize impacts.

Permanent Project Impacts	Temporary Project Impacts	Proposed Mitigation Measures*
General Wildlife		
Potential for waterfowl collisions with electric transmission line and disturbance of nest sites. If an evaporation pond is used, concentrated salt brine could adversely affect waterfowl and other wildlife.	Potential for disturbance of sensitive habitats	1. Set construction zone limits to minimize impacted areas and restrict access to sensitive habitats (Sutter NWR, wetlands, riparian, active nest trees) during critical periods. 2. Conduct preconstruction surveys to ensure that species not previously identified on site will not be impacted. Coordinate with the USFWS and CDFG for protective measures. 3. Provide a qualified biologist during all phases of construction to monitor activities as needed and respond to biological issues as they may arise. 4. Provide Worker Environmental Awareness Training. 5. Install bird flight diverters to shield wires to minimize collision potential. 6. Monitor electric transmission line collisions for significant effects. 7. Prevent wildlife from entering evaporation pond with cover or deflectors (if evaporation pond is used).
Swainson's Hawk (BIO-9)		
Loss of 19.137 acres forage habitat: *16.737 acres annual grassland [16.0 SPP site, 0.73 access road, 0.007 utility poles]* and *2.4 acres crop land [2.2 rice for switchyard, 0.1 wheat and 0.1 walnut for dehydrators]* Loss of potential nest trees (walnut trees) Potential collisions with electric transmission line.	Potential for nest disturbance if active nest within ½ mile of project activities.	1. Off-site habitat compensation at 1:1 for grassland and 0.5:1 for crop land for a total of 17.937 acres of forage habitat 2. Establish a fund with appropriate agencies to purchase and manage the replacement habitat. 3. Remove walnut trees before nesting season. 4. Incorporate oak trees in visual screen to offset loss of potential nest trees (walnut). 5. Conduct preconstruction surveys in 1999 and 2000 for active nest sites. 6. Avoid disturbance within ½ mile of nests from March 1 through August 15. Designated biologist to monitor if construction within ½ mile of nest site. 7. Worker Environmental Awareness Training. 8. Revegetation of habitats temporarily disturbed. 9. Install bird flight diverters to shield wires to minimize collision potential.

Giant Garter Snake (BIO-8)		
Loss of 4.907 acres of upland habitat (permanent impacts to 200-foot buffer along canals and rice fields) *4.907 acres grassland and crop habitats [2.7-ac grassland for SPP, 2.2-ac crop for switchyard, 0.007-ac grassland for utility poles]*	Disking site for fire control Soil disturbance (noise and vibrations) in 6 acres of upland habitats from trenching pipeline and augering holes for utility poles. Potential for take of giant garter snake from construction activities.	1. Off-site habitat compensation at 3:1 (to include one part aquatic to two parts upland) for a total of 9.814 acres upland and 4.907 acres of aquatic (wetland) to replace lost upland habitat. 2. Establish a fund for the acquisition of mitigation credits that will facilitate the purchase, enhancement, and management of habitat before construction begins. 3. Provide a biological monitor to conduct sweeps 24 hours prior to breaking ground in areas of construction. 4. Provide Worker Environmental Awareness Training. 5. Construct natural gas pipeline, and auger power poles during giant garter snake active period (May through October). 6. Provide biological monitor continually on site if construction is conducted during hibernation (October through May). 7. Revegetate habitats after construction. 8. Mow site instead of disking to minimize potential harm to snakes. 9. Construct hibernacula in strategic areas of upland habitat. 10. Use approved herbicide with no residual or migratory effects.
Migratory birds (BIO-10)		
Potential collisions with 145-foot tall HRSG emission stacks in flyway. Potential collisions with 4.0 miles of transmission wires.	Disturbance of migration activities.	1. Provide suitable space between conducting wires, install bird flight diverters on top ground wires. 2. Monitor and document mortalities from HSRG stacks and transmission wires in annual monitoring report.
Migratory Fish		
*NA (If using evaporative cooling, potential for contaminants in discharge water)	Potential sedimentation into canals that are tributaries to natural waterways and Sutter Bypass. Subsurface flow impacts from directional drill under Sutter Bypass water channels.	1. Implement erosion control plan to eliminate sedimentation. 2. Streambed Alteration Agreement or waiver that eliminates/minimizes impacts to fish and wildlife in natural waterways, including Sutter Bypass and canals that are tributaries to natural waterways. 3. Use dry cooling towers for zero discharge to irrigation canals and Sutter Bypass aquatic habitats, eliminating potential adverse impacts to fish from contaminants.

Giant Garter Snake (BIO-8)		
Loss of 4.907 acres of upland habitat (permanent impacts to 200-foot buffer along canals and rice fields) *4.907 acres grassland and crop habitats [2.7-ac grassland for SPP, 2.2-ac crop for switchyard, 0.007-ac grassland for utility poles]*	Disking site for fire control Soil disturbance (noise and vibrations) in 6 acres of upland habitats from trenching pipeline and augering holes for utility poles. Potential for take of giant garter snake from construction activities.	1. Off-site habitat compensation at 3:1 (to include one part aquatic to two parts upland) for a total of 9.814 acres upland and 4.907 acres of aquatic (wetland) to replace lost upland habitat. 2. Establish a fund for the acquisition of mitigation credits that will facilitate the purchase, enhancement, and management of habitat before construction begins. 3. Provide a biological monitor to conduct sweeps 24 hours prior to breaking ground in areas of construction. 4. Provide Worker Environmental Awareness Training. 5. Construct natural gas pipeline, and auger power poles during giant garter snake active period (May through October). 6. Provide biological monitor continually on site if construction is conducted during hibernation (October through May). 7. Revegetate habitats after construction. 8. Mow site instead of disking to minimize potential harm to snakes. 9. Construct hibernacula in strategic areas of upland habitat. 10. Use approved herbicide with no residual or migratory effects.
Migratory birds (BIO-10)		
Potential collisions with 145-foot tall HRSG emission stacks in flyway. Potential collisions with 4.0 miles of transmission wires.	Disturbance of migration activities.	1. Provide suitable space between conducting wires, install bird flight diverters on top ground wires. 2. Monitor and document mortalities from HSRG stacks and transmission wires in annual monitoring report.
Migratory Fish		
*NA (If using evaporative cooling, potential for contaminants in discharge water)	Potential sedimentation into canals that are tributaries to natural waterways and Sutter Bypass. Subsurface flow impacts from directional drill under Sutter Bypass water channels.	1. Implement erosion control plan to eliminate sedimentation. 2. Streambed Alteration Agreement or waiver that eliminates/minimizes impacts to fish and wildlife in natural waterways, including Sutter Bypass and canals that are tributaries to natural waterways. 3. Use dry cooling towers for zero discharge to irrigation canals and Sutter Bypass aquatic habitats, eliminating potential adverse impacts to fish from contaminants.

Wetlands (BIO-11)		
Loss of 5.83 acres of seasonal wetlands under SPP footprint and surrounding construction zone.	Potential for temporary disturbance to wetlands in Sutter NWR from vehicles and runoff. Disking site for fire control.	1. Off-site replacement at 1:1 for 5.83 acres of like-kind wetlands. 1. Establish an endowment fund for the acquisition of mitigation credits that will facilitate the purchase, enhancement, and management of wetlands before construction begins. 2. Construct temporary construction zone fencing around wetlands in refuge near construction activities. 3. Route SPP stormwater runoff away from remaining wetlands. 4. Use mowing instead of disking as fire control on site. 5. Conduct aerial photography and field monitoring to document wetland protection efforts. 6. Mark and avoid all wetland areas within Sutter NWR. 7. Construct pipeline under or along Hughes Road.
* Mitigation measures may change after negotiation with USFWS, CDFG, NMFS, and/or CEC are finalized. * NA: None Anticipated.		

6.1 Construction Mitigation Monitoring by Designated Biologist

Calpine will designate a qualified biologist to implement the mitigation measures outlined in this BRMIP. The designated biologist and/or an approved representative under the direct supervision of the designated biologist will supervise construction activities in sensitive habitat areas, assist the construction engineer in preparing construction zone limits, present the Worker Environmental Awareness Training program, and advise Calpine on how best to avoid adverse impacts to biological resources. The designated biologist will implement the mitigation measures through the construction phase and monitor the electric transmission line impacts for at least three years (see Appendix G) after construction. The designated biologist will be on site during construction in giant garter snake habitat and in areas with active Swainson's hawk nests. The designated biologist will advise Calpine and the CEC concerning biological issues and will prepare Monthly Compliance Reports for submittal to the CEC CPM.

6.2 Worker Environmental Awareness Training

A Worker Environmental Awareness Training program will be instituted for all Calpine personnel and subcontractors who will be working on the SPP project sites. This program includes a classroom presentation with visual and written materials designed specifically for the SPP project area. The program identifies the types of SPP project

impacts that could occur from construction, operation, and maintenance activities and the project rules each worker is required to follow to protect sensitive biological resources in the SPP project area. All personnel who receive training will sign an affidavit declaring that they understand and will adhere to any project rules set forth in the program. The SPP Worker Environmental Awareness Training program is outlined in Appendix B.

6.3 Construction Zone Limits

Construction zone limits are developed to minimize construction impacts to sensitive habitats and rare plants in areas of construction. Calpine designed the project features to avoid sensitive areas to the greatest extent feasible during the engineering design phase and by designating construction zones. This will minimize unavoidable direct impacts to surface areas. Construction zones include the area of immediate surface disturbance and adjacent areas used by vehicles and workers. Construction zone limits will be set up within the implementation areas of the SPP footprint, the natural gas pipeline route, the electric transmission line pole footings, the switchyard footprint, and the dehydrator station footprints to keep construction impacts to designated areas (Figures 3a through 3c).

Construction zone limits can be designated with fencing, flagging, and/or signage placed between the impact area and sensitive habitats. The method chosen should match the impact (i.e. siltation fences around wetlands in Sutter NWR, flagging on protected trees, signage identifying sensitive species and habitats, etc.). A Worker Environmental Awareness Training program will be presented to all Calpine personnel and contractors that includes instruction on complying with construction zone limits. Documentation of the effectiveness of the construction zone limits will include photographs depicting conditions of the seasonal wetlands before and after construction of SPP.

The designated biologist will consult with the Sutter NWR manager prior to and during any construction through the refuge. Signage and/or flagging will mark sensitive habitats adjacent to the construction zones along the gas pipeline route within the Sutter NWR, including wetlands, riparian trees, and California hibiscus. Wetlands in the Sutter NWR include seasonal and perennial wetlands that encroach on the right-of-way for Hughes Road. All wetland areas in the Sutter NWR will be restricted from construction personnel and vehicle entry. The Worker Environmental Awareness Training Program will be implemented by the designated biologist to instruct workers on restrictions to those areas. Any nest sites located along the utility corridor routes during the preconstruction surveys will be marked and flagged. Laydown and parking areas (approximately 0.1 to 0.5 acres each) along the gas pipeline and electric transmission line

routes will be sited on previously disturbed areas and marked with flagging to minimize surface disturbance. One-hundred-fifty-foot square (approximately 0.5 acre) construction zone limits will be established for directional drilling equipment and operations at each bore location.

Construction zone limits will be established around the switchyard and drip stations facilities to minimize impacts to the agricultural crops in those areas.

Construction zone limits approximately ten-foot square will be established around each electric power pole footing to allow movement of construction workers and equipment. Heavy equipment such as cranes will remain on the road or other disturbed areas during construction of the poles. Construction zone limits will also be established for the crane operators and other heavy equipment to minimize impacts to vegetation and canal berm habitat. Silt fencing will be used in areas near irrigation canals. Any nest sites located in annual grassland habitats along the transmission line route during the preconstruction surveys will be flagged and marked for avoidance or transplantation.

Any unforeseen areas required for project activities not previously surveyed for biological resource impacts or approved by the designated biologist will not be disturbed until he/she determines that the disturbance will not cause significant impacts. The designated biologist will obtain clearance from the CEC (and other agencies if required) of the project changes and document approvals in writing through the Plan Modification Process (Appendix E).

The Designated Biologist will supervise construction activities in areas requiring avoidance or containing special-status species and provide the CEC with written records in the Monthly Compliance Reports documenting the construction monitoring activities.

6.4 Preconstruction Surveys

6.4.1 General Wildlife

Preconstruction surveys will be conducted 24 hours prior to ground breaking on the SPP project site and along the gas pipeline and electric transmission line routes for active nest sites, den sites, or other sensitive locations of native species. Any active site will be marked and recorded. If construction activities have the potential to harm sensitive sites, actions will be taken to avoid the location or move the nest with agency approval.

6.4.2 Swainson's hawk

Preconstruction field surveys (conducted under CDFG guidelines) to identify active nest sites will be conducted in the spring (April, May, and June), before construction begins. If nest sites are found to be within ½ mile of a project activity, the designated biologist, or appropriate representative identified by the designated biologist, will monitor the behavior of the nesting birds in relation to project activities. Construction in the forage areas of breeding birds will also be monitored to determine if disturbance could cause failure of birds to adequately provide for themselves and their young. The designated biologist will stop work if it appears the activities will obviously impede reproductive success.

6.4.3 Giant garter snake

Preconstruction field sweeps (conducted under CDFG and USFWS guidelines) will be conducted in all proposed project construction areas 24 hours before earth moving activities begin at that site. If giant garter snakes are found during the sweep, the designated biologist will make noise and vibrations to repel snakes from the construction area and notify the USFWS of the sighting. Removal of snakes will only be conducted with agency authorization. Snake fences will be installed where necessary around construction areas where snakes are likely to be found. The designated biologist will be on-site during construction activities in areas where snakes are found. Pipeline trenches left open overnight will be covered to prevent snakes from becoming trapped. If a snake should become trapped, the designated biologist will notify the USFWS and with authorization and/or assistance remove the snake and relocate it to a safe area.

The Designated Biologist will supervise construction activities in areas requiring avoidance or containing special-status species and provide the CEC with written records in the Monthly Compliance Reports documenting the construction monitoring activities.

6.5 Timing Restrictions on Construction

Timing construction activities to avoid sensitive nesting or hibernation periods in the SPP project areas will eliminate or reduce adverse impacts to sensitive species.

Construction of the natural gas pipeline and electric transmission line requires trenching and deep augering along irrigation canals that support habitat for threatened giant garter snakes. Giant garter snakes forage in rice fields, irrigation canals, and ponds for small fish, amphibians, and reptiles in the SPP project areas. They are actively foraging in warm months from May through September and hibernate in underground burrows (hibernacula) from October through April and are highly susceptible to earth moving

equipment during this time. Impacts to giant garter snakes can occur from the excavation of irrigation canals and hibernacula during hibernation periods. Calpine and PG&E will trench and auger in giant garter snake habitat only from May through September.

Construction of the natural gas pipeline and electric transmission line will occur in areas with riparian trees or isolated trees near agricultural crops that are suitable as Swainson's hawks nest trees. Swainson's hawks nest from March 1 through August 15 in the project area and migrate to Central and/or South American for the winter. Construction in areas ½ mile from active nests should be postponed until after August 15 or until the fledglings are no longer dependent on the nest tree. Because the Swainson's hawk nesting period occurs simultaneously with the active giant garter snake season, the construction seasons appear to conflict. Therefore, if construction cannot be scheduled outside the Swainson's hawk nesting season, CDFG will require intensive monitoring of active nest sites within ½ mile of construction activities. The designated biologist, or appropriate representative identified by the designated biologist, will monitor the behavior of the birds during courtship, nest building, incubation, and the period while raising their young in relation to project activities. The designated biologist will stop work if it appears the activities will impede reproduction.

6.6 Modify Project Design: Operations and Maintenance

Calpine and Western will modify the new electric transmission lines by installing colored bird flight diverters (BFDs) on the top ground wires to make the wires more visible to birds during flight and minimize bird collisions. BFDs are 15-inch-long PVC tubing coiled to a height of 7 inches, spaced 5 meters apart along the wires (see Appendix G). BFDs are especially effective at increasing visibility of wires during fog and rain events and have reduced avian collisions by 89 percent (Brown and Drewien 1995).

Mowing the Calpine property instead of disking the open areas around the SPP and Greenleaf 1 facility would reduce impacts to seasonal wetlands and giant garter snakes on the property. Maintenance activities should include mowing to a height of six inches after the SPP project is constructed.

6.7 Habitat Compensation

Habitat compensation will be implemented for permanent loss of seasonal wetlands, Swainson's hawk forage habitat, and giant garter snake upland habitat. A total of 19.137 acres of surface land will be permanently lost to construction of the SPP and ancillary facilities. These habitats will be compensated in off-site mitigation banks at various

ratios for a total of 38.488 acres. These habitats will be managed for wildlife in perpetuity. Consultations with federal and state agencies were conducted to determine the mitigation ratio for replacement habitats. Also, the CEC required that annual grassland, crops and wetlands used as Swainson's hawk forage habitat that are also used as giant garter snake habitat be mitigated separately for each species. Also, seasonal wetlands will be mitigated separately as wetland habitat and Swainson's hawk forage habitat. This results in a total of 38.488 acres of replacement habitat for the 19.137 acres lost. A Habitat Compensation Plan is presented in Appendix D that shows the locations of habitat compensation and the funding mechanism to purchase compensatory mitigation credits.

Seasonal wetlands encompassing 3.0 acres on the SPP site will be permanently lost to construction. An additional 2.83 acres may be indirectly impacted during construction. A total of 5.83 acres of seasonal wetlands will be replaced at a 1:1 ratio; for every one acre of wetland lost, one acre of wetland will be created in an off-site mitigation bank.

Swainson's hawk forage habitat lost from SPP construction includes: 16.0 acres of grassland and seasonal wetland (seasonal wetlands may be considered forage habitat when dry), 0.73 acres of grassland for the access road, 0.007 acres of grassland for the electric transmission line pole footings, 2.2 acres of rice crop at the switchyard location, and 0.2 acres of wheat and walnut crops at the drip station locations. Annual grassland and seasonal wetlands considered Swainson's hawk forage habitat will be replaced at a 1:1 ratio. Crop lands used as Swainson's hawk forage habitat will be replaced at a ratio of 0.5:1. A total of 19.137 acres of Swainson's hawk forage habitat will be lost to construction and 17.937 acres of forage habitat will be created/preserved off-site.

Giant garter snake upland habitat lost from SPP construction includes: 2.7 acres of grassland on-site, 0.007 acres of grassland for pole footings, and 2.2 acres of rice at the switchyard for a total of 4.907 acres of upland habitat. No aquatic habitat will be lost from SPP construction. Giant garter snake upland habitat will be replaced at a 3:1 ratio; for every acre of upland lost, three acres of replacement habitat (2/3 of which will be upland and 1/3 will be aquatic) will be preserved off-site. Replacement habitat includes 9.814 acres of upland habitat and 4.907 acres of aquatic habitat for a total of 14.721 acres that will be replaced in an off-site location.

Potential replacement habitat for Swainson's hawk and giant garter snake may be available in the Sutter NWR expansion project, Wildlands Inc. mitigation bank in Colusa and Placer counties, Gilsizer Slough conservation easement, Middle Mountain Foundation, or the Yolo County Land Trust. Mitigation credits for seasonal wetlands are

available at the Wildlands, Inc. mitigation bank. An endowment fund will be set up with a mitigation bank under approval from regulatory agencies (CEC, USFWS, USACE) and Calpine before construction of the SPP project begins. The fund will cover the costs to purchase land, construct habitats, manage the land area, and monitor success of construction.

If after construction the acreage of habitats lost from construction differs from the proposed amount, mitigation will be adjusted to reflect the necessary changes. A deposit in the amount that covers the proposed acres mitigated will be placed in the mitigation fund before construction begins and will be adjusted after completion of construction when evaluations of aerial photos determine exact acreage impacted. Calpine will settle final payment through Wildlands, Inc. or other approved mitigation bank under CDFG, USFWS, USACE, and/or CEC approval.

6.8 Erosion Control and Habitat Restoration in Disturbed Areas

Erosion control, stormwater runoff control, and revegetation of disturbed areas will be used to restore habitats in temporary construction areas. The SPP Erosion Control, Revegetation, and Stormwater Management Plan (Appendix F) will be implemented to protect waterways (irrigation canals, sloughs, and Sutter Bypass) from siltation that could affect fish and wildlife resources. A Section 401 of the Clean Water Act (CWA) water quality certification from the California Regional Water Quality Control Board (CRWQCB) will be obtained before construction begins. This certification documents that the project design and construction methods will not adversely affect surface water supplies. A Streambed Alteration Agreement from the CDFG may also be necessary for stream crossings in the Sutter Bypass and tributaries to natural waterways.

Stormwater will be controlled by the use of impermeable plastic construction barriers in areas of sensitive habitat, i.e. waterbodies and wetlands. Construction debris and other waste materials will be removed to an appropriate landfill after construction is complete in each project area.

Revegetation of temporary construction areas will be implemented with like-kind species (i.e., grassland species in grassland areas and crop species in crop areas). Revegetation of annual grassland is anticipated along the gas pipeline trench, around the electric power pole footings, and in areas adjacent to the SPP footprint. Revegetation of croplands will be conducted adjacent to the switchyard and Poundstone Drip Station. Revegetation will be conducted as soon as possible after disturbance and before the rains begin in November. Temporarily disturbed croplands will be replanted as directed by the property

owner. The SPP Erosion Control, Revegetation, and Stormwater Management Plan has a detailed description of the revegetation methods, including plant species, planting rates, and maintenance (Appendix F).

6.9 Monitoring Plans and Reports

Monitoring plans that identify the methods that will be used to monitor potential project impacts on biological resources were prepared for the remaining seasonal wetlands on-site (Appendix C) and to determine if the electric transmission line significantly affects special-status migratory birds in the project area (Appendix G).

Seasonal wetlands on the SPP site encompass a total of 8.67 acres. Construction of the SPP footprint will result in the loss of 3.0 acres and indirect impacts to 2.83 acres (for a total of 5.83 acres) of these wetlands. The remaining twenty-two seasonal wetlands (2.84 acres) will be preserved on-site. Impacts to some of these wetlands could occur from construction of the electric transmission line poles. No impacts to wetlands are expected from operation of the SPP. The On-Site Wetland Protection Plan addresses the methods that will be used to protect the remaining wetlands during construction and operation (Appendix C). A wetland monitoring report describing the effectiveness of the preservation mitigation measure will be prepared by Calpine and submitted to the CEC Compliance Project Manager (CPM) during construction of the SPP and after the first year of operation. If it can be shown that the wetlands were not adversely impacted by construction and operations would not impact them, Calpine will have the option to request staff to cease monitoring requirements.

A monitoring plan was developed to analyze whether the new electric transmission line and HRSG stacks cause significant impacts to special-status birds and waterfowl from collisions and/or electrocutions (Appendix G). The plan includes searches along the new transmission line during waterfowl migration season for special-status birds killed by collision with the line. An estimate of total collisions will be determined using dead bird searches and formulas detailed in the Avian Power Line Interaction Committee (APLIC) document, which includes measures to determine search, removal, habitat, and crippling biases (APLIC 1994). The calculated number of waterfowl and special-status bird collisions will be compared to the number of birds allowed to be taken in the USFWS Biological Opinion (Appendix H).

7.0 IMPLEMENTATION SCHEDULE

Implementation of the mitigation measures outlined in this BRMIP will be conducted throughout the construction and operation of the SPP project. Table 3 outlines a relative schedule for implementation of mitigation measures.

Table 3. Relative schedule for implementation of mitigation measures.

Task	Timing
Construction mitigation monitoring by designated biologist	April 1999 through December 2000
Worker environmental awareness training	At project initiation
Construction zone limits	Prior to any surface disturbance.
Preconstruction surveys	Daily prior to surface disturbance for giant garter snake and at start of nesting season for Swainson's hawk each year of construction
Timing restrictions on construction	At initiation of project and after preconstruction surveys
Modify project design: operations and maintenance	At initiation of project and after construction of transmission line and HRSG stacks
Habitat compensation	Prior to project construction, expected first quarter of 1999
Erosion control and revegetation of disturbed areas	Erosion control during construction and revegetation in October 1999 and 2000 after temporary disturbance
Monitoring plans and reports	Plans available prior to construction of transmission line for birds and before construction of SPP for wetlands and annual monitoring reports due as identified below.
On-site wetland monitoring	First quarter 1999 through 2001, annual report due July 31
Bird collision monitoring	Fourth quarter 2000 through 2003, annual report due April 30
Summary Report for Implementation and Success of Mitigation Measures	30 days after construction completion (January 2001)

8.0 IMPLEMENTATION MONITORING/VERIFICATION PROGRAM

Verification of mitigation will be documented on daily monitoring forms, Monthly Compliance Reports, and in the final BRMIP Summary of Mitigation Measures for the Sutter Power Plant Project that will be submitted to the CEC within 30 days after completion of construction. The avian collision and on-site wetland monitoring and annual reports will continue after the final BRMIP Summary report for the indicated duration.

Compliance of each mitigation measure will be monitored by the designated biologist according to the schedule in Table 3 and documented on compliance verification forms (Figure 4) for each site visit. The daily forms will record where, when, and how construction activities are performed and whether compliance was met. Monthly Compliance Reports will summarize the activities for each month. The summaries will include a discussion of whether the mitigation measures were successful, compared to the success criteria where applicable. It will also include all the plan modifications and remedial measures taken if the success criteria were not met during the mitigation monitoring process. Appendix D presents the process that Calpine will use to modify the BRMIP. Table 4 outlines the performance standards or success criteria for each mitigation measure.

A master compliance verification form will be managed by the designated biologist and included in the final compliance report to the CEC CPM (Figure 5).

Table 4. Monitoring tasks and criteria that determine successful implementation of mitigation measures.

Mitigation Measure	Monitoring Type	Monitoring Duration	Monitoring Frequency	Success criteria
Construction zone limits	on-site observation	throughout construction	daily or as needed	no adverse impact to surrounding habitats
Habitat Compensation	payment	in perpetuity	once	copy of receipt to CEC
Preconstruction surveys	direct observation	through construction	daily for ground disturbance and 3 times each spring for Swainson's hawk	summary in monthly compliance report
On-site wetland protection	monitor functionality and disturbance	through construction and one year of operation	annually	wetland indicators present in wetlands
Transmission line markers	direct observation	ten years	annually	presence of all markers
Transmission line and HRSG avian collisions	mortality count	three years or until no impact determined	three months in winter and one month in summer	estimated total collision does not exceed incidental take allowance
Worker Environmental Awareness Training	direct observation of attendance	throughout construction for new employees	at start of project construction	signed affidavits
Erosion Control and Revegetation Plan	direct observation of performance	two years after seeding	annually for two years	successful growth of vegetation in planted areas

Figure 4. Compliance Verification Report Form.

COMPLIANCE VERIFICATION REPORT Report Number:		
Project:	Date:	
Location:	Arrival time:	Departure time:
Responsible party:		
Compliance monitor:	Discipline:	
Monitored mitigation measure:		
Frequency of monitoring:		
Compliance criteria:		
Compliance: ☐ Acceptable	☐ Unacceptable:	
	☐ Remedial action implemented	
	☐ Require work stop	
	☐ Follow-up required	
Activity:		
Observations:		
Recommendations:		
Report approval:		
Print name:	Signature:	
Receipt acknowledged by resident construction supervisor:		
Print name:	Signature:	
Date: Time:		
Comments/Actions:		
Data entered into Monthly Monitoring Report:		

ure 5. Master Compliance Verification Report Form.

MASTER COMPLIANCE VERIFICATION REPORT

oject: Sutter Power Plant Project Location: Sutter County, California

oject Owner: Calpine Corporation

Mitigation Measure	Responsible Party for Implementation	Date(s) for Implementation	Compliance Criteria	Date Completed	Signature of Monitor	Compliance Verification Report(s)	Responsible Oversight Agency	Remarks
ABITAT COMPENSATION								
Wetlands								
Swainson's hawk								
Giant garter snake								
ECONSTRUCTION SURVEYS								
AINSON'S HAWK (1999)								
SPP site								
Gas pipeline								
Drip stations								
Transmission line								
Switchyard								
ANT GARTER SNAKE (1999)								
SPP site								

Mitigation Measure	Responsible Party for Implementation	Date(s) for Implementation	Compliance Criteria	Date Completed	Signature of Monitor	Compliance Verification Report(s)	Responsible Oversight Agency	Remarks
NSMISSION LINE MARKERS								
2000								
OSION CONTROL AND REVEGETATION PLAN								
1999								
2000								
AN COLLISION MONITORING (Transmission Line and HRSG Stacks)								
2000								
2001								
2002								
N-SITE WETLAND MONITORING								
1999 (baseline)								
2000								
2001								
2002								

Mitigation Measure	Responsible Party for Implementation	Date(s) for Implementation	Compliance Criteria	Date Completed	Signature of Monitor	Compliance Verification Report(s)	Responsible Oversight Agency	Rema
CONSTRUCTION ZONE LIMITS								
SPP site (1999)								
Gas pipeline (1999)								
Drip stations (1999)								
Transmission line (1999)								
Switchyard (1999)								
SPP site (2000)								
Gas pipeline (2000)								
Drip stations (2000)								
Transmission line (2000)								
Switchyard (2000)								
WORKER ENVIRONMENTAL AWARENESS TRAINING								
1999								
2000								

Mitigation Measure	Responsible Party for Implementation	Date(s) for Implementation	Compliance Criteria	Date Completed	Signature of Monitor	Compliance Verification Report(s)	Responsible Oversight Agency	Remarks
~~Gas pipeline~~								
Drip stations								
Transmission line								
Switchyard								
SWAINSON'S HAWK (2000)								
SPP site								
Gas pipeline								
Drip stations								
Transmission line								
Switchyard								
GIANT GARTER SNAKE (2000)								
SPP site								
Gas pipeline								
Drip stations								
Transmission line								
Switchyard								

9.0 REFERENCES

APLIC (Avian Power Line Interaction Committee). 1994. Mitigating Bird Collisions with Power Lines: The State of the Art in 1994. Edison Electric Institute. Washington, D.C.

Brown, W., and Drewien, R. 1995. Evaluation of Two Power Line Markers to Reduce Crane and Waterfowl Collision Mortality. Wildlife Society Bulletin, 1995. 23(2): 217-227.

APPENDIX A—DESIGNATED BIOLOGIST QUALIFICATIONS AND DUTIES

The designated biologist must be approved by the CEC CPM (Compliance Project Manager) at least 90 days prior to the start of ground-breaking activities and must meet the minimum qualifications outlined in the Conditions of Certification BIO-1 of the CEC's FSA for the SPP project.

The designated biologist for the SPP project construction is:

- Name:
- Address:
- Phone number:
- Degree:
- Field biology experience:
- Field experience in project area:
- Education and experience for required tasks:

Duties of the Designated Biologist include:

- Advise Calpine's Site Superintendent or Project Engineer on the implementation of the biological resources Conditions of Certification,
- Supervise or conduct mitigation and monitor compliance of mitigation measures, especially in areas requiring avoidance of sensitive habitats and/or species.
- Notify Calpine and the CEC CPM of non-compliance with any condition and the corrective actions taken, and advise the construction and operations engineer when to resume construction.
- Maintain written records of the tasks to include in the Monthly Compliance Reports to the CEC CPM.
- Develop and present the Worker Environmental Awareness Training program to Calpine personnel and their contractors.

APPENDIX B—WORKER ENVIRONMENTAL AWARENESS TRAINING PROGRAM

The Worker Environmental Awareness Training (WEAT) program (Condition of Certification BIO-4) consists of an on-site and/or classroom presentation that identifies the sensitive biological resources that could be encountered in the SPP project construction areas and the reasons for protecting these resources. The presentation includes the types of construction activities that could impact biological resources and the measures developed to avoid impacts. It will also include instruction on who to contact if sensitive habitats or species are found and the consequences of non-compliance with protective measures developed for the project.

This information will be presented to each worker during employee orientation sessions. In addition, the material will be available at the Construction Site Superintendent's field office. Each participant in the WEAT program will sign an affidavit declaring that the individual understands and will abide by the guidelines set forth in the program material. The person administering the WEAT program will also sign each statement. The signed affidavits will be kept on file for at least six months after termination of employment.

Types of construction impacts:

- Trenching along canal berms in giant garter snake habitat could result in the take of a threatened species.
- Open trenches may trap wildlife, including giant garter snakes.
- Disturbance of habitats from equipment will require restoration.
- Vehicle disturbance to protected wetlands on the site and in the Sutter NWR. These will be fenced, marked, and monitored in monthly status reports.
- Possible disturbance of nesting Swainson's hawk if found within ½ mile of construction activities.

Types of operation impacts:

- Disturbance of protected wetlands on site by disking instead of mowing, which is less damaging.
- Stormwater runoff must not contain hazardous waste or debris that would affect biological resources.
- The electric transmission line and HRSG stacks may cause migratory bird collisions.

Project construction rules:

- Stay in approved work area (construction zone limits)
- Use approved access roads only
- Keep out of exclusion areas such as wetlands
- Do not litter
- No pets, firearms or hunting
- No fires
- Smoke only in cleared areas
- Do not feed or disturb wildlife
- Clean up and report all hazardous material spills
- Report injured or dead wildlife using the Wildlife Observations Form (Figure B-1).

The WEAT program will also include presentations on:

- Federal and state regulations and fines imposed for non-compliance.
- Responsibilities of the designated biologist.
- Who to call when giant garter snakes or nest sites are found.
- Video or slides showing the sensitive areas in the SPP project area.
- Cards, baseball card size with photos of sensitive biological resources.
- Pamphlet with signature page.
- Costs/consequences for not following project rules.
- Poster for field office with photos, who to call, wetlands, project rules
- Monitoring requirements of designated biologist including photography of wetlands and other sensitive habitats before and after construction activities.

Figure B-1. Wildlife Observation Form

WILDLIFE OBSERVATION FORM

To Record Animals Found In Sutter Power Plant Project Areas

To be filled out by personell who find active nest sites and burrows, dens, and dead or injured wildlife, or other biological resources during daily construction activities.

Name of employee:

Date:

Location of observation:

Condition of wildlife:
alive ☐ dead ☐

Possible cause of injury or death:

Where is the animal currently?

Is the resource in danger of project (or other) impacts?

Comments:

Please contact the Designated Biologist for questions and to report any wildlife, nest, or den in the project area that could be disturbed. The Designated Biologist will advise personnel on measures required by California Department of Fish and Game (CDFG) and United States Fish and Wildlife Service (USFWS) to protect fish, wildlife and vegetation from construction impacts.

DESIGNATED BIOLOGIST:	PHONE:
COMPANY:	EMAIL:
ADDRESS:	
USFWS CONTACT:	
CDFG CONTACT:	

APPENDIX C—ON-SITE WETLAND PROTECTION PLAN

WETLAND MONITORING PLAN

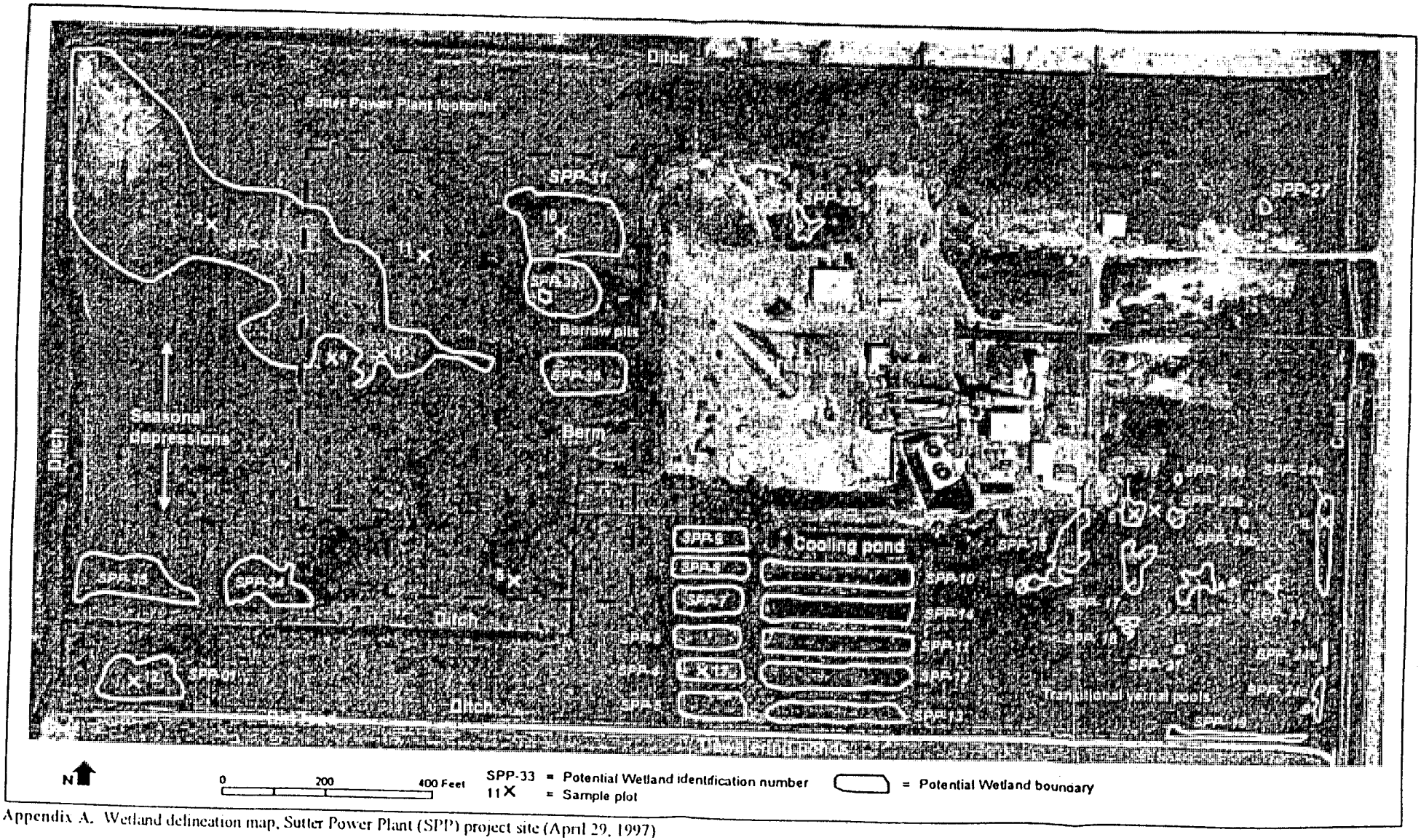
Note: This On-Site Wetland Protection Plan was developed to monitor wetlands remaining on site after construction of the evaporative cooling towers as part of the SPP facility. Evaporative cooling towers emit a fine mist potentially containing particulate matter and salts. The wetland monitoring section of this On-Site Wetland Protection Plan was to monitor for potential impacts from the cooling tower drift and indirect construction activities. ***Calpine Corporation has decided to replace the evaporative cooling towers with dry cooling towers that do not emit substances to the atmosphere or surrounding open areas.*** *Potential impacts from cooling tower drift are no longer a part of the project and construction activities are not expected to occur in the area where the remaining wetlands are located. The CEC included the wetland monitoring requirements in their Preliminary Staff Assessment. Because Calpine has eliminated impacts from the construction and operation of SPP, the CEC will most likely not require monitoring of wetlands remaining on-site (Personal communication between Linda Spiegel (CEC Staff biologist) and Debra Crowe (project biologist), September 22, 1998). The wetland monitoring plan will be implemented only if the CEC and Calpine determine it to be necessary after final project review. The determination will be included in the CEC Final Decision for the project.*

C.1. Introduction

As discussed in the previous sections, eight seasonal wetlands encompassing 5.83 acres will be lost to construction of the SPP on the Calpine property. Twenty-two seasonal wetlands encompassing 2.84 acres will remain on-site after construction (Figure C-1). As a Condition of Certification (BIO-11) of the SPP project, the CEC requires that the remaining wetlands on-site be monitored for functionality on an annual basis for the life of the project (expected 30 years), however, the monitoring frequency may be decreased or monitoring may cease if it can be shown the SPP has no impact on the remaining wetlands.

C.2. Protection of On-site Wetlands

Potential indirect impacts to remaining seasonal wetlands on-site include soil compaction from construction vehicles, debris and stormwater runoff into wetlands, disking for fire control, and temporary construction impacts to vegetation. Indirect impacts are not expected to occur, however, several protective measures will be implemented during



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

construction, operation, and maintenance of the SPP to ensure protection of the remaining wetlands on the Calpine property.

1. During construction of the SPP construction debris and runoff will be confined to immediate construction areas. Use of impermeable fence barriers would be implemented if construction is anticipated within 500 feet of remaining wetlands on-site and Sutter NWR wetlands.

2. During operation of the SPP, stormwater runoff will be routed away from wetlands to the discharge canal on site.

3. Construction vehicles will be limited to access roads and construction areas only. Construction zone limits that identify sensitive habitats by flagging and/or signage will be implemented.

4. If construction of the SPP unexpectedly requires construction vehicles to access wetland areas, the activity will be limited to months when the soils are dry and hard. A protective cloth/platform (temporary platform from railroad ties, wire mesh, or other material that supports heavy equipment) that protects against soil compaction will cover the wetland before access to vehicles is allowed.

5. Revegetation of disturbed habitats will be implemented after construction is complete (see SPP Erosion Control, Revegetation, and Stormwater Management Plan in Appendix F). Revegetation of habitats will include like-kind species, i.e., grassland species in grassland areas and wetland species in wetland areas.

6. The grasslands on-site, which include the seasonal wetlands, will be mowed during the summer for fire control instead of disking to preserve the integrity of wetland soils and potentially increase the number of wildlife species that inhabit the wetlands and grasslands. Mowing simulates the historic grazing that occurred in the area before farming and may allow soils to develop defined horizons. Wetlands with trees and cattails (former mosquito abatement ponds) will be left undisturbed as in previous years.

7. Preconstruction and post-construction aerial photographs will be taken and analyzed to determine the amount of wetland taken by the SPP or impacted outside the footprint. A monitoring report will be submitted to the CEC and USACE documenting wetland acreage affected by construction.

8. A fund to finance the monitoring program will be set up before construction is complete. The fund will cover the first year of monitoring costs and be updated if it is determined by Calpine and CEC that further monitoring is warranted (i.e. if SPP operations adversely affect wetland function).

The following sections of the monitoring plan outline the success criteria, field methods, monitoring schedule, monitoring reports, and suggested remedial actions if adverse wetland impacts are observed and attributed to SPP operations.

C.3 Wetland Monitoring Methods

Wetland ecosystems and surrounding landscapes are dynamic and constantly changing. Variability in the wetland ecosystems resulting from natural processes needs to be taken into account when monitoring over a period of time. Short-term changes in seasonal weather cycles such as temperature and precipitation (drought and floods) can produce variability in wetland function from year to year. Documenting change is useful but the ultimate objective is for the wetlands to retain a functional capacity. Because the wetlands on the SPP site are man-made and have developed to their present state over a relatively short period of time, they are expected to show changes over the monitoring period, probably for the better. Functional capacity of the seasonal wetlands on the SPP site includes the ability of the wetland to hold water and support wetland plant species, and in some instances are habitat for aquatic invertebrates.

Success Criteria

The seasonal wetlands on-site retain wetland parameters in that they have indicators of wetland hydrology, soil, and vegetation. Wetland indicators are defined in the 1987 USACE Wetland Delineation Manual. The wetland indicators observed for the SPP wetlands are included in the Sutter Power Plant Wetland Delineation Report (Foster Wheeler 1997).

The remaining seasonal wetlands on-site are expected to retain their current wetland functions during construction, operation, and maintenance of SPP. The success criteria for this project are identified as the presence of wetland indicators, which are described in the following paragraphs. Field data will be collected from the wetlands after construction to determine if success criteria are present. The data will be compared to a control wetland with similar wetland characteristics. If Calpine shows impacts to wetlands are a possibility from operations, they may use a control wetland in the Colusa National Wildlife Refuge (Colusa NWR), which receives inundation from rainfall similar to the wetlands on Calpine's property. A special-use permit is required from the refuge manager authorizing access to the control wetland. If the wetlands on-site retain wetland indicators after the first year of operation, it should be determined that adverse impacts from SPP operations are not occurring on-site and the frequency of monitoring should be decreased or stopped.

Wetland hydrology indicators include inundation and/or saturation of soils long enough to support wetland vegetation. The seasonal wetlands on-site obtain hydrological characteristics from direct precipitation and runoff from surrounding uplands during the

wet season (November to March). Adverse impacts to wetland hydrology can occur when 1) a source of inundation is cut off (drainage from surrounding uplands), drained (by trenches), or re-routed, or 2) if contamination of the water prevents wetland vegetation from growing, or 3) the wetland is filled, or 4) inundation does not occur long enough to support wetland vegetation (over a period of years), or 5) the contour slopes are modified which change the drainage pattern and direction. It should be noted that severe drought can temporarily have an affect on hydrology in a wetland but normally does not destroy a wetland.

Wetland soil indicators include presence of the underlying clay layer, low chroma, and/or concretions. Adverse impacts to wetland soils occur if 1) soils become compacted (deep tire ruts) or 2) the impermeable clay layer is punctured.

Wetland vegetation indicators include a predominance of plant species whose indicator status is FAC (facultative), FACW (facultative-wet), or OBL (obligate) as identified in Reed 1988. Adverse impacts to wetland vegetation occur if 1) the hydrology is absent (no inundation or saturation long enough to support wetland species), or 2) soils are modified (leveled or punctured) to where they do not retain water, or 3) contaminants from source water, or weed control affect productivity.

Field Methods for Data Collection

Baseline data was collected from the wetlands on-site during the wetland delineation activities in April 1997. Additional data and photographs will be collected from on-site wetlands and control wetland in the 1998-99 wet season before construction begins. These data will be used to compare data collected during the monitoring program.

Field data will be collected during the wet season (November to March) to determine wetland parameters of the remaining wetland on-site and the control wetland. Data will be recorded on data sheets (Figure C-2) for each wetland.

Collection of hydrology data will include depth and duration of inundation. Contact with SPP and Colusa NWR personnel will be initiated by the Designated Biologist to determine the start of inundation. Depth and drainage patterns will be identified during the field data collection each monitoring year. Observations of aquatic invertebrates and other wildlife species utilizing the wetland will be documented on the data sheets.

Figure C-2. Wetland Monitoring Data Sheet

Project:	Date:	Page of
Survey objective:	Observer(s):	
Equipment:	Wetland ID No:	Photo No:
	Time start:	Time end:

Weather conditions: (wind direction/speed, precipitation, visibility, cloud cover, temperature)

VEGETATION

Plant Species/layer	% Relative Cover	Indicator Status	Plant Species/layer	% Relative Cover	Indicator Status
Percent Wetland Vegetation:			Is Wetland Vegetation Present?		

HYDROLOGY

Wetland Indicators:

Water Depth (cm):

Duration of Inundation (days) and Source

Other Species

Is Wetland Hydrology Present?

SOILS

Wetland Indicators

Observed Disturbances

Salt Accumulation

Wetland Soils Present?

NOTES

Is Area Still a Wetland?

Soils will be monitored for compaction from vehicles or other disturbances. Soil sample pits will be obtained and analyzed for wetland soil indicators from representative wetland types.

Most wetland vegetation species occurring on the SPP site may be identified during the wet season, however, some annual species may require identification in the spring. Each species observed will be noted on the data sheets. The dominant species (greater or equal to 20 percent relative cover) will be identified. The wetland vegetation status will be determined if 50 percent or more of the dominant species are FAC, FACW, and/or OBL.

Photographs of each wetland will be obtained on an annual basis to document vegetation and hydrology. The photographs will be taken at the same vantage point each year. The vantage points will be included on Figure C-1 in the monitoring reports.

Monitoring Schedule

Wetland monitoring will be conducted annually during the wet season. Table C-1 identifies the monitoring schedule for wetland parameter data collection. Monitoring of the wetlands will be conducted during the two years of construction and for one year of operation and may be discontinued if Calpine and CEC Staff agree that the wetlands are not being adversely affected by SPP operations. If adverse or questionable adverse impacts are observed during the first year, monitoring will continue and remedial actions may be implemented.

Table C-1. Monitoring schedule and wetland parameters for field data collection.

Wetland Parameter	Field Data Collection Date	Data to Collect
Hydrology	January	Wetland hydrology indicators, water depth, drainage patterns, duration of inundation, use by aquatic invertebrates and other wildlife species.
Soils	January	Wetland soil indicators, disturbance of contour slopes, vehicle traffic, accumulation of salts.
Vegetation	January and possibly April	Wetland vegetation indicators, dominant plant species, percent of relative cover, indicator status of species.

Data Analysis and Monitoring Reports

The data collected during the monitoring program will be analyzed to determine if there is change in wetland indicators within the remaining wetlands on-site. Changes in wetland hydrology can be measured by a change in depth and duration of inundation. Each wetland will be evaluated for indicators of wetland hydrology, soil, and vegetation. These results will be compared to the baseline data and control wetland data to determine if there are changes in wetland function, i.e. capacity to hold water, vegetation changes from wetland to upland species, or soil disturbance. The table in Figure C-3 will be used as a summary sheet to document success criteria (wetland indicators) that are met for each wetland.

A monitoring report will be submitted to the CEC no later than July 31 of each year monitoring is completed. The report will contain the following:

1. Introduction
   Includes the monitoring year and brief description of the project.

2. Field methods
   Data collection methods used.

3. Results
   Includes changes in SPP operation or maintenance activities, data collected, species observed.

4. Analysis of Impacts
   Includes determination of changes in wetland indicators, comparison to control wetland, and whether success criteria are met.

5. Discussion and Recommendations
   Includes recommendation for changes in monitoring frequency.

Figure C-3. Summary of wetland parameters for each seasonal wetland on the SPP site.

Project: Survey date:

Survey objective: Observer(s):

Wetland #	Control	1	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	21	22	23	24	25
Wetland type*																							
Vegetation met?																							
Hydrology met?																							
Soil met?																							
Changes from baseline data																							

*V=transitional vernal pool, B=borrow pit, D=seasonal depression, M=mosquito abatement pond, P=perennial pond

Notes:

Remedial Actions

Remedial actions are proposed remedies for adverse project impacts not initially anticipated to occur as part of the proposed project. Remedial actions that would ensure no net loss of wetlands would be implemented if adverse impacts (i.e. do not meet success criteria) occur from SPP operations. Adverse impacts could include fill of wetlands, destruction of hydrology or soil structure, or adverse water quality.

Adverse impacts are not expected to occur to wetlands remaining on-site after construction of SPP, either from operations or maintenance of the plant. However, if impacts are observed during the monitoring program, the following steps will be taken:

1. Evaluate if SPP operations are the cause of adverse impacts by a comparison to control wetlands (include analysis in annual monitoring report).
2. Contact CEC with adverse impact analysis results and possible solutions.
3. Identify if impact can be repaired immediately and/or easily with corrective measures to repair soil structure and/or contours, or enhance vegetation with plantings.
4. Continue monitoring for at least five years after adverse impact corrected.
5. If corrective action are not possible on-site, resort to off-site remedial action, such as off-site mitigation for wetland acreage impacted in an approved mitigation bank under consultation with USACE, USFWS, and CEC.

References

Foster Wheeler (Foster Wheeler Environmental Corporation). 1997. Wetland Delineation Report Sutter Power Plant Project, Sutter County, California. Prepared for Calpine Corporation. June.

Foster Wheeler. 1998. Biological Assessment Sutter Power Plant Project, Sutter County, California. Prepared for Western Area Power Administration. April.

Reed, P.B., Jr. 1988. National list of plant species that occur in wetlands: California (Region 0). U.S. Fish and Wildlife Service Biological Report 88 (26.10). 135 pp.

APPENDIX D—HABITAT COMPENSATION PLAN

Location of Mitigation Lands

All habitats permanently lost to construction of the SPP facility, natural gas pipeline, electric transmission line and switchyard will be replaced and preserved in off-site areas. Habitats temporarily disturbed during construction will be restored to original vegetation types after construction.

Several potential locations were reviewed for mitigation purposes;

- Sutter NWR expansion project (Calpine would need to complete construction of habitats and monitor for 5 years before available to USFWS to complete mitigation),
- Middle Mountain Foundation (too new and not organized enough to meet monitoring and management requirements),
- CDFG Conservation Easement at Gilsizer Slough (surrounding lands are actively farmed),
- Yolo County Land Trust (transfers habitats outside of Sutter County),
- Wildlands, Inc. in Placer County (does not contain giant garter snake or Swainson's hawk habitat).
- Wildlands, Inc. in Colusa County (not fully established).

Ecologically, the preferred location for habitat replacement was within the Sutter NWR because it is in close proximity to the SPP site and contains similar habitats that will be lost to construction. The Sutter NWR is planning to purchase rice fields south of its property to expand the refuge by a maximum of 1,000 acres.

The second most preferred location for habitat mitigation is at the USFWS approved mitigation bank Wildlands, Inc. Wildlands, Inc. is constructing a new mitigation bank (Dolan Ranch Conservation Bank) in Colusa County under consultation with the USACE, USFWS and CDFG. The 252-acre property is west of the Sutter Buttes and Sacramento River approximately three miles south of the town of Colusa. It is on the east side of Highway 20 near the Colusa Airport and approximately 18 miles northwest of the SPP site. The new mitigation bank will be managed for seasonal wetlands, giant garter snake, and Swainson's hawk forage habitat. Mitigation credits are expected to be available by late 1998 or early 1999. The CDFG has given verbal authorization for Calpine to purchase credits for giant garter snake and Swainson's hawk in the Dolan Ranch Wildlands, Inc. mitigation bank and seasonal wetlands in the Placer County Wildlands, Inc. mitigation bank for the SPP project.

Table D-1. Habitat acres lost, replacement ratios, habitat replacement acres, and location of mitigation.

Project Area	Total Acreage Lost	Swainson's hawk forage habitat		Giant garter snake habitat		Wetlands
		grassland[#] (acres)	Crop[#] (acres)	upland (acres)	aquatic[+] (acres)	seasonal (acres)
SPP footprint and access road	16.73	16.73	0	2.7	0	5.83
Gas pipeline	0[*]	0[*]	0[*]	0[*]	0	0
Dehydrator stations	0.2	0	0.2	0	0	0
Electric transmission line	0.007	0.007	0	0.007	0	0
Switchyard	2.2	0	2.2	2.2	0	0
Total habitat acres mitigated	19.137	16.737	2.4	4.907	0	5.83
Mitigation ratio		1:1	0.5:1	3:1[+]	-[+]	1:1
Total replacement habitat	38.488	16.737	1.2	9.814	4.907	5.83

[*]Temporary or indirect impacts to habitats only.
[#]Because the function of cropland and dry seasonal wetlands for Swainson's hawk is forage habitat, croplands and wetlands lost to SPP project will be mitigated with annual grassland.
[+]Giant garter snake aquatic habitat will not be lost but is a part of the mitigation replacement habitat for loss of upland habitat.

Funding Mechanism

An endowment fund will be set up with a mitigation bank (most likely Wildlands, Inc.) under approval from regulatory agencies (CEC, USFWS, USACE) and Calpine before construction of the SPP project begins. The endowment fund will include monies for habitat compensation and monitoring programs. The fund will include costs for the total proposed mitigation requirements, however, Calpine may be refunded excess mitigation payments after construction if the habitat acreage impacted by project construction is less than the proposed amount. Total habitat acreage impacted will be determined by aerial photography within 30 days after completion of construction and documented in a report to the CEC Compliance Project Manager.

APPENDIX E—PLAN MODIFICATION PROCESS

This BRMIP contains mitigation and implementation measures that protect biological resources from project impacts to the maximum extent feasible. However, it is possible that unforeseeable project or regulatory changes could occur before or during construction. Some of these changes would require changes and/or additions to the BRMIP. Project changes could be required if current construction plans are found to be unsuitable for the project. Regulatory changes could occur if a non-listed species becomes listed under the Federal and state Endangered Species Acts and is found in the project area.

If it becomes essential to change mitigation or implementation measures, the CEC CPM will notify Calpine and the designated biologist in writing that a change in project design (engineering, construction methods, etc.) may require a change in mitigation measures and/or implementation measures. Calpine and the designated biologist will then submit a Change Order within 30 days that outlines specific changes or suggestions that will minimize impacts from a change in construction methods or to newly listed species. Calpine and the designated biologist will then receive authorization from the CEC within 14 days (and other agencies if required) for the project changes. All requests and approvals will be in writing and included in the Monthly Compliance Reports.

APPENDIX F—EROSION CONTROL AND REVEGETATION PLAN

Erosion Control, Revegetation, and Storm-water Management Plan

1. Background

Erosional processes occur naturally in most areas. As the inclination of slopes increase, the intensity of erosion increases a corresponding amount. In addition, as the amount of vegetative or engineered cover decreases the amount of erosion increases a corresponding amount. Two general types of erosional processes occur in most areas. *Surface erosion* is the particle-by-particle removal of soil and rock fragments from the ground surface, usually by water, wind, or ice. *Mass wasting* is the downslope movement of soil/rock materials as more or less cohesive masses, at rates ranging from extremely slow to extremely rapid. Factors affecting various portions of the areas disturbed during construction will combine in various intensities, depending primarily on the site characteristics and climatic conditions. Erosion is initiated when a number of key

elements combine and reach a critical threshold level. The type of process that is initiated is dependent on the combination of site and climatic characteristics.

1.1. Surface Erosion

Surface erosion in the vicinity of the site consists of a number of processes. Erosional processes related to flowing water include sheet erosion, rill erosion, and gullying. Surface runoff is the primary agent of erosion that will impact areas disturbed by construction. Sheet and rill erosion will be the predominant type of surface erosion. Gullying may occur in areas where slopes exceed 10%; if areas are left unprotected during precipitation events. Aeolian (wind) erosion will occur in non-vegetated areas. The amount of aeolian erosion is primarily dependant on wind velocity and soil moisture content.

1.2. Mass Wasting

Debris flows consist of masses containing various combinations of soil, rock, water and vegetation that flow rapidly downslope in a viscous state. These commonly are initiated on steep slopes, pick up speed and more materials as they move downslope, and run out onto areas of flatter terrain or into stream channels. They typically occur when ground conditions are saturated, during intense, prolonged rainstorms. Landslides are similar to debris flows, except that their movement rates are generally very slow, and they may even occur in areas of very gentle slopes. Landslides are the result of a combination of factors, similar to debris flows, and usually include removal of downslope support beneath the mass of material, and high ground water or soil moisture levels. Only a few areas of the project, very limited in spatial extent, could be impacted in this way.

2. Hydrology

Average annual rainfall is between 17 and 18 inches. The rainy season typically occurs from November through March. January is the wettest month, with an average precipitation of 4.03 inches. Summers are dry, July being the driest month, with an average precipitation of 0.05 inches. Measurable rainfall occurs, on average, 58 days per year. The majority of construction involving disruption of surficial material is scheduled to take place during summer months, when surface runoff will be minimal.

3. Methodology

3.1 Construction

3.1.1 General conditions

No pollutants, other than sediment, are anticipated to be present in storm-water runoff from the site. The construction of the power plant and switch yard will permanently alter surface drainage patterns in those areas. The degree of alternation will be minimal, and primarily consist of a decrease in the infiltration rate of surface runoff. The construction of either the transmission lines or gas pipelines will not permanently alter surface drainage patterns.

3.1.1.1 Materials

The storage and handling of toxic materials during construction is addressed in section 8.12 of the application. Construction related debris will be stored and disposed of in an appropriate manner. Small trash items and miscellaneous debris will be placed into storage bins for periodic disposal. Salvageable wastes will be stored onsite in a manner to prevent contamination of storm-water runoff and will be removed periodically.

3.1.1.2 Equipment

Construction equipment will be stored in a manner to minimize contact with storm water. Construction equipment will be stored in areas outside the natural surface drainage patterns and away from areas where storm water will pool and percolate to ground-water. All equipment loading and unloading will be done in a manner to minimize the effects on natural drainage patterns. Equipment access areas may be graded or protected to minimize deterioration due to equipment travel. No off-road vehicular travel, or equipment operation, shall take place during times of high soil moisture conditions when the surface cannot support such equipment or vehicles without causing excessive damage to vegetation and/or surface soils.

Equipment storage, cleaning, fueling, and maintenance areas will be located and maintained in a manner to prevent any contaminants from adversely affecting the quality of storm-water runoff. If necessary, absorbent pads shall be placed to catch all leaks from equipment parked overnight. In addition, refueling of vehicles shall be prohibited within 100 feet of a waterway. All spills will be cleaned up immediately. Major equipment cleaning and maintenance shall not be conducted along any of the pipeline or transmission line construction corridors.

3.1.2 Erosion Control measures

Erosion control measures will be implemented to reduce erosion associated with construction and various project structures. Erosion control measures available for application include revegetation, use of slope protection systems, soil moisture control systems, temporary structures to reduce the impacts from surface runoff during construction, and permanent engineered structures, such as culverts and ditches, to re-direct surface runoff upon completion of construction.

3.1.2.1 Surface Runoff control

3.1.2.1.1 Temporary construction control measures

Temporary control measures are used to re-direct surface runoff, decrease the velocity of surface runoff, capture suspended sediment, and stabilize exposed soil. These measures are most commonly employed during construction. Straw bale dikes, sandbag dikes, and siltation fences, will be installed as necessary along construction perimeters. Because the majority of construction will take place during months of very low precipitation use of these control measures is likely to be limited to the power plant and switchyard areas.

Aeolian erosion of disturbed soil is likely to be of more widespread concern during the construction period. Abatement measures will be taken wherever necessary to limit the production of dust from wind erosion in amounts damaging to property, cultivated vegetation, or causing nuisance to persons living or traveling in the vicinity. The following control practices will be employed to reduce aeolian erosion: limit speed of construction vehicles, dust watering, and covering spoil piles and applying dust suppressants if the spoil pile will not be disturbed for a period longer than 21 days. Section 8.9.3.1 of the license application provides a more detailed description of how temporary erosion control measures will be implemented.

3.1.2.1.2 Engineered structures

Engineered structures may be used to support, reinforce, or protect a slope or facility. These structures are primarily for sites where other alternatives will not be effective. In general, engineered structures will be applied on steep, highly erodible slopes or in situations where it is impractical to use a non-structural alternative because of site use. Engineered structures may include retaining walls, slope drains, and structures specifically designed to protect drainage ditches/canals. Due to the topography of the area, it is not anticipated that these measures will be required.

3.1.2.2 Slope Protection

Slope protection systems are designed to facilitate establishment of vegetation on slopes where inclination, aspect, or the rate of ongoing surface erosion requires reinforcement of the growing vegetation while root structures are being established. Slope protection systems usually consist of some type of mesh to hold the seed or seedlings in place, supported by weights or pinning to keep the mesh from migrating down the slope. The use of such protection systems is expected to be extremely limited for this project.

3.1.2.3 Revegetation

The objectives of revegetation include establishment of root structures to hold soil in place, reduction of the intensity of falling rain on surficial soils, providing obstacles that reduce the rate of surface runoff, and minimize the loss of wildlife habitat in the area. Establishment of vegetation provides long-term (usually permanent), relatively low cost and maintenance-free erosion protection. Revegetation is not a suitable solution for stopping active mass wasting, because the new vegetation will move downslope with the mass of soil/rock. Thus, in the few areas susceptible to mass wasting, such as steep road embankments disturbed during pipeline construction, care will be exercised to prevent the initiation of mass wasting.

The main biological and ecological benefits of using local native plants in restoration and revegetation work are straightforward. Such material is genetically adapted to specifics of the local climates and microclimates, resulting in better establishment and longevity of those plants. Revegetation with native species (Table 1) also provides wildlife habitat for species in the area, such as Swainson's hawk and the giant garter snake. Indiscriminate use of non-native species, and non-locally adapted native species, potentially disrupts natural ecosystem processes by introducing weeds, as well as genetically native gene pools. Although the specifics of such impacts are being debated, most biologists would agree that the use of locally adapted plant material in environmental restoration activities is the preferred approach.

Disturbed areas will be provided with permanent vegetative cover. Seeding operations will take place after the slopes and other areas have received final grading. In addition, any concentrated flow of water will be diverted from the seeding area. The intent of the grading operation is to provide a reasonably smooth surface free of rills and gullies. Prior to seedbed preparation the soil may be tested to determine existing nutrient conditions. Chemical fertilizer, humus, manure, or other appropriate organic soil supplement(s) shall

be applied if the soil tests show that existing fertility of the topsoil was lost as a result of construction activities.

A range of seedbed preparation methods shall be used, after final grading is complete. The seedbed preparation method used for any individual site shall depend on various factors including size of area, slope, potential for erosion and landowner requirements. The seedbed shall be prepared to a depth of 3 to 4 inches, where possible, by harrowing, disking or mechanical raking to provide a firm seedbed. Seed will be dispersed by dry broadcasting where slopes are less than 2:1. Manually operated cyclone-type spreaders will be employed to uniformly broadcast the seed. After broadcasting, the seed will be manually raked, on contour, into the top 3/8-inches of soil.

Hydroseeding may be employed for slopes greater than 2:1. Hydroseeding shall consist of mixing and applying seed with fiber and water. Hydroseed mix shall be applied at a rate of 1,500 lbs/acre of fiber mulch, 80 lbs/acre of organic tackifer and seed mix, as described in Table 1 *Erosion Control Seed Mix.* Organic tackifier shall be Ecology Control, Terratack III or other tackifier of similar quality. Mixing of materials for application with hydroseeding equipment shall be performed in a tank with a built-in continuous agitation system of sufficient operation capacity to produce a homogeneous mixture, and a discharge system that will apply the mixture at a continuous and uniform rate.

To reduce aeolian erosion and erosion from surface runoff, sloped and other critical areas will be mulched after seeding. Mulch materials will consist of straw or hay free from grain, wheatseed, and mold. The mulch will be applied at a rate of approximately 1,500 lbs/acre as soon as possible after seeding. The mulch will be spread uniformly over the seeded area and then punched into the soil using a mulch tiller, a modified sheepsfoot roller, or a weighted agricultural disc.

3.1.3 Non-storm-water Management

Non-storm water discharges will be controlled to the extent feasible. Appropriate measures will be taken to ensure construction water does not pollute receiving waters. Portable sanitary facilities will be provided for construction workers, as necessary. Construction water will be limited to the quantities necessary to give sufficient dust and wind erosion control, provide sufficient moisture for compaction of soils, and to wash aggregate.

3.2 Operation

3.2.1 Storm-water management monitoring

Disturbed areas, and areas used for storage of materials, that are exposed to precipitation will be inspected for evidence of, or the potential for, pollutants entering the drainage system. After stabilization measures are in place for any portion of the construction site, inspections will be conducted at least once every month during summer months, and at least every two weeks during periods of significant rainfall, greater than 1.0 inch/week.

3.2.2 Erosion Control Monitoring

The inspection and maintenance schedule will be finalized during construction to ensure that erosion control requirements are being met. Initially construction activities will be monitored for erosion control effectiveness on a daily basis, starting with the initial disruption of surface conditions. Monitoring frequency may be extended if daily monitoring is determined to be excessive. However, monitoring during construction will be at least weekly. In addition to the regularly scheduled monitoring and inspection program, inspection will also occur following special events, such as significant large rainfall, spills, or discharges from construction activities. This schedule will be continued until all disturbed areas are stabilized. An *Erosion Control/Storm Inspection Log* will be maintained that documents field inspections and any maintenance and/or repair work performed. Where significant erosion has occurred, information on intensity and type of erosion shall be recorded, and the area will be repaired as necessary. The log shall also note areas that cannot be immediately repaired due to saturated soils or inaccessibility to equipment, and an estimate of when repairs will be initiated.

3.2.3 Monitoring effectiveness of revegetation

Vegetation restoration will be monitored following the completion of construction. Areas where vegetation is not re-established, or where erosion takes place will be identified, and appropriate remedial actions implemented. Potential actions will include additional seeding, installation of irrigation systems to promote vegetation growth, regrading, or installation of engineered structures to control surface-runoff. Corrective actions will be implemented as soon as feasible, but not later than the start of the next rainy season.

Vegetation monitoring will be conducted as part of routine project maintenance activities, and after major storm events. Areas that have been re-seeded will be monitored at least

annually for a period of 2 years following seeding. When needed, additional remedial measures will be implemented as part of the project maintenance program.

Table F1. Erosion Control Seed Mix

Scientific Name	Common Name	Seed Application (lbs/acre)
Bromus carinatus	California Native Brome	9
Melica californica	California Melicgrass	4.5
Elymus glaucus	Blue Wild Rye	6
Eschscholzia californica	California Golden Poppy	1
Lupinus succulintus	Arroyo Lupine	1.5
Vulpia myuros	Zorro Fescue	7
Total		29

APPENDIX G— AVIAN COLLISION MONITORING PLAN FOR SUTTER POWER PLANT ELECTRIC TRANSMISSION LINE AND HRSG STACK IMPACTS

INTRODUCTION

Project Description

Calpine Corporation (Calpine) is requiring a new 4.0-mile 230kV electric transmission line to connect their proposed Sutter Power Plant (SPP) project to existing Western Area Power Administration (Western) lines. The new electric transmission line will parallel existing roadways south from the proposed SPP site to the east levee of the Sutter Bypass (Figure G-1). The SPP also requires construction of two 145-foot tall Heat Recovery Steam Generator (HRSG) stacks at the plant site.

The transmission line route follows county roads. Sutter County is in the Pacific Flyway and is wintering grounds for large flocks of ducks, geese, cranes, and shorebirds. Several special-status birds winter in the project area, including Aleutian Canada goose, peregrine falcon, bald eagle, greater sandhill crane, and Swainson's hawk. Other raptors in the area include red-tailed hawk, Northern harrier, white-tailed kite, and turkey vulture. Public and agency concerns about project impacts warrant post-construction monitoring for avian collisions with the transmission lines and HRSG stacks. Agencies (USFWS and CDFG) are concerned that populations of special-status species could be adversely affected by collisions with the lines or stacks. Hunters are concerned about lines causing population decline of game birds such as geese, ducks, pheasants, and dove, however, they are also concerned that transmission lines will deter birds from coming into areas that they use as hunting grounds.

Transmission Line and HRSG Stack Descriptions

The proposed power poles are 106-foot tall, single metal poles with double circuit-upswept arms (Figure G-2). Two parallel ground wires will be strung from the top of the poles for protection from lightening. The ground wires are normally thinner in diameter than conductor wires and do not conduct electricity. The ground wires will include fiberoptic lines as communication conductors between the plant and switchyard. Cement footings for the power poles will be augured into the ground, spaced approximately 750 feet to 800 feet apart. Western will construct the lines for the project and are expected to begin construction in the fall of 1999.

The proposed HRSG stacks are 145 feet tall with a diameter of 18.5 feet each and will be positioned within the security fence of the plant site (Figure G-3). The stacks are 175 feet apart and constructed of steel. Red airplane collision avoidance lights will be placed at the top of the stacks. Nitrogen and oxygen are the primary gases expelled by the HRSG stacks.

Mitigation Measures

Mitigation measures were developed during the Application For Certification (AFC) and Endangered Species Act (ESA) Section 7 consultation for the SPP project. The USFWS, CDFG, and CEC were consulted for appropriate measures that would minimize avian impacts from collisions and electrocutions. The transmission line route was chosen to minimize the crossing of open areas potentially used as forage by migratory birds and raptors. The mitigation measures also include designing the conductor wires for spacing greater than the wing spans of large birds (43 inches on the vertical and 60 inches on the diagonal) to prevent electrocutions. The top ground wire will be fitted with Bird Flight Diverters (BFDs) to visually enhance the wire and subsequently deflect birds from colliding with hard to see wires. Annual monitoring of the lines will be conducted to determine if the lines are a significant impact to waterfowl and special-status birds that forage and/or nest in the area.

The top ground wire will be marked with BFDs along the proposed route (Figure G-1). Studies have shown BFDs may reduce avian collisions by 57% to 89% (APLIC 1994). The BFDs are preformed high-impact PVC spirals that thread onto the shield wires (Figure G-4). They are 7 to 15 inches long with two 7-inch tall spirals. Optimal spacing is 5 meters apart. The BFDs can be staggered if more than one ground wire is used to achieve the optimal 5-meter spacing (Figure G-4). They come in gray or yellow with UV stabilizers for exposure to sunlight. The BFDs are spun onto the ground wire after it is pulled into place on the poles.

OBJECTIVES OF MONITORING PLAN

Incidental Take

Projects subject to federal and state Endangered Species Act and Migratory Bird Treaty Act provisions require consultation with the USFWS, NMFS, and CDFG on project impacts to listed species. During the SPP project impact analysis, Calpine anticipated that special-status birds might be incidentally taken as a result of implementing the proposed project. A Biological Assessment for the SPP project was submitted to the

USFWS and NMFS to initiate formal Section 7 consultation on April 22, 1998, describing potential project impacts to special-status species and proposed mitigation measures that minimize impacts. The CEC initiated consultation with the CDFG. The USFWS, NMFS, and CDFG will issue Biological Opinions (BO) and a Memorandum of Understanding (MOU), respectively, that will identify the amount or extant of Incidental Take allowed by the project. Incidental take is defined as take (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect a listed species) that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Incidental take of listed species could occur incidental of the SPP project if special-status birds collide with the electric transmission lines or HRSG stacks.

The special-status bird species anticipated to be in the project area include bald eagle, peregrine falcon, greater sandhill crane, Aleutian Canada goose, and Swainson's hawk. These species are either listed as threatened or endangered by the USFWS and/or the CDFG. The proposed spacing of the conductor wires will most likely eliminate electrocution hazards to large birds, however, collisions could occur with the top ground wire or conductor wires.

The significance criteria used in this monitoring plan are the number of each listed bird species allowed by USFWS and CDFG to be taken incidental to the project. The significance criteria (number of birds allowed) will be defined in the BOs and MOU. This monitoring plan describes the methods that will be used to determine if the significance criteria are exceeded and whether BFDs deflect the waterfowl and special-status bird species sufficiently to meet the USFWS and CDFG Incidental Take requirements.

METHODS

Installation of Bird Flight Diverters

Western and/or Calpine will install the BFDs during construction of the transmission line following the recommended spacing and locations (Figure G-4). The BFDs will be placed on the ground wires after the wires are threaded onto the power poles. They will be staggered over the two ground wires to be spaced five meters apart so that each wire supports one-half of the markers. Conductor wires are normally large enough in diameter to be seen by birds in flight and should not require marking with BFDs.

Monitoring for Bird Collisions

Because the new electric transmission line and HRSG stacks will be constructed in an area known to be habitat for several special-status birds, monitoring is required by the USFWS to determine if the line adversely affects populations of these birds. Calpine

recognizes the need to protect special-status species from project impacts. This monitoring plan will focus on evaluating the number of special-status birds that may be killed from collisions with the top ground wire and conductor wires. The significance criteria used in this monitoring plan are the number of each special-status bird species allowed to be taken incidental to the project as defined by the USFWS and CDFG. The agencies and CEC will be notified when any special-status species is found dead from collisions during quarterly dead bird searches. Waterfowl and other non-listed birds will be monitored for collisions with the lines and HRSG stacks and will be included in the annual reports to the USFWS, CDFG, and CEC.

Dead Bird Searches

Field searches for dead birds and feather spots (location where feathers are left after removal of carcass by predator or scavenger) will be conducted along the new electric transmission line and in the area around the HRSG stacks on-site to determine if the project causes significant impacts to birds. Monitoring the transmission line for avian collisions will begin after construction is complete and BFDs are installed. Monitoring avian collisions with the HRSG stacks will occur after construction of the SPP is complete.

Analysis of the winter and summer dead bird searches includes evaluation of the field search results, computation of bias estimates and estimated total collisions (see below), and a comparison of observed collision mortality relative to the significance criteria.

The searchers will follow a zig-zag pattern through the search areas to allow observations of the entire area. Two people will simultaneously conduct the surveys on either side of the lines.

When dead birds are found, the following information will be collected: map location of each dead bird, species, sex, age (adult or juvenile), approximate time of death, physical condition (broken bones, burns, open wounds, gunshot wounds, discoloration, damage by scavengers, etc.), and probable cause of death. These data will be recorded on field data sheets (Figure G-5).

Searchers

Qualified biologists familiar with the above mentioned special-status birds will conduct the dead bird searches under supervision of the Designated Biologist. Additional information may also be obtained from SPP operations personnel that may find dead birds during daily activities. This information will be included in the annual reports. A

search bias will be calculated for each searcher (see section on Search Bias below) that will be included in the estimate of total collisions.

Dogs will not be used to conduct searches as there are too many variables in their results (wind, temperature, vegetation height) and a search bias would have to be calculated for each dog. Search equipment includes: binoculars, spotting scope, pin flags, and bird tags.

Search Area

Dead bird searches will be conducted along the marked 4.0-mile electric transmission line. The width of the search area is determined with relation to the height of the powerline poles (APLIC 1994). The searches will be conducted in a corridor 45 meters (147.6 feet) from the outer conductors on either side of the 230-kV transmission line (APLIC 1994).

Searches for dead birds around the HRSG stacks will be conducted in a 55-meter (180.4 feet) radius from the stacks. Most of this area is within the security fenceline of the SPP site.

Documentation of Results and Reporting

All data collected by each searcher during the dead bird searches will be recorded on data sheets in the field. Figure G-5 presents a sample data sheet that will be used. The data sheets will be included with a description of activities in the annual monitoring reports to the CEC. Monitoring reports will be submitted by March 31 of each monitoring year.

Monitoring Schedule

Aleutian Canada goose, peregrine falcon, greater sandhill crane, and bald eagle are expected to be in the project area as early as October and could be found through March. Swainson's hawks are expected to be in the project area from March through September. Surveys for dead bird searches along the transmission line and HRSG stacks will focus on the winter migration period when the majority of birds are in the area. Searches will be conducted once a month in December, January, and February to include the migratory birds and once in July to include the period when juvenile Swainson's hawks are most likely to fledge. The designated biologist will notify the Sutter NWR manager of the scheduled bird searches before going out each time. The Sutter NWR may conduct their own bird searches along the existing PG&E and Western transmission lines near the refuge simultaneously for comparison purposes.

The dead bird searches will be conducted for the first three years after the startup of the SPP and electric transmission line (expected fourth quarter of 2000). If monitoring shows non-significant impacts to migratory and special-status birds from the project at the end of three years, Calpine will request from the CEC, USFWS, and CDFG a reduction in monitoring frequency or cessation of monitoring. Annual monitoring reports will be submitted to the CEC by March 31 of each monitoring year.

DATA ANALYSIS

Biases can occur in searches for dead and injured birds. Four biases are identified that could cause an underestimation of the number of birds that collide with transmission lines: search bias, removal bias, crippling bias, and habitat bias (APLIC 1994). In order to compensate for the underestimation of avian collisions, these biases will be analyzed and included in the estimated total bird collisions for the project.

Search Bias

A search bias takes into consideration a searcher's ability and experience, terrain, and vegetation. A bias is measured for each searcher. Dead birds are randomly placed in the search area and the searcher tries to locate as many of the planted birds as possible. A search bias will be calculated for each searcher for each season of the year to adjust for changes in vegetation heights. The percent of "planted" birds not found determines the search bias. The formula for calculations is as follows:

SB=(TDBF/PBF) – TDBF,

Where SB = search bias, TDBF = total dead birds and feather spots found in the search area, and PBF = proportion of planted birds found during the recovery.

Example: if 8 dead birds are found, including 4 out of 5 of the planted birds:

SB = (8/(4/5)) – 8 = 2 birds will not be found by this particular searcher

Removal Bias

A removal bias is determined to consider the number of birds scavengers remove from the search area before a search. To measure a removal bias, a number of dead birds are marked and placed in the search area and the condition of the birds are monitored daily for one week. Removal bias is the percentage of missing birds with no trace remaining after one week. A removal bias will be calculated for each season of the year. The formula to determine removal bias is:

RB = (TDBF + SB)/PNR – (TDBF + SB),

Where RB = removal bias by scavengers, PNR = proportion of "planted birds not removed by scavengers, TDBF = total dead birds found, and SB = search bias.

Example: if 8 dead birds are found and 4 out of 5 planted birds are recovered:

RB = (8 + 2)/(4/5) – (8 + 2) = 2.5 birds are expected to be removed by scavengers

Habitat Bias

A habitat bias is used only when some portion of a search area is not accessible because of water or dense vegetation (i.e. Gilsizer Slough). The habitat bias estimates the percent of unsearchable habitat for each transmission line segment. Habitat bias should only be used in limited situations where unsearchable habitat is finely interspersed with searchable habitat and where searchers can demonstrate the number of birds found in searchable and unsearchable habitats are similar. Habitat bias should only be included in the calculation for estimate of total collisions if credible numbers are calculated on-site. The formula to determine habitat bias is:

HB = (TDBF + SB + RB)/PS – (TDBF + SB + RB),

Where HB = habitat bias, and PS = proportion of area that is searchable

Example: if 95 percent of the search area is searchable:

HB = (8 + 2 + 2)/(95/100) – (8 + 2 + 2) = 0.6 birds may not be found

Crippling Bias

A crippling bias is determined to consider the number of birds that fall or move outside the search area. Crippling bias is difficult to obtain (time and effort are involved in monitoring flights and collisions) and estimates from other studies may be inappropriate or misleading. Crippling bias should only be used in the estimate of total collisions if credible numbers are obtained on-site. The formula to determine crippling bias is:

CB = (TDBF + SB + RB + HB)/PBK – (TDBF + SB + RB + HB),

Where CB = crippling bias and PBK = the proportion of observed collisions falling within the search area.

Example: if 4 out 5 birds that collide with the lines land in the search area, then:

CB = (8 + 2 + 2 + 0.6)/(4/5) – (8 + 2 + 2 + 0.6) = 3.15 birds are expected to collide and go out of the search area

Estimate of Total Collisions (ETC)

An estimate of total avian collisions can be calculated using the field search results and the above bias estimates. The ETC adds the total dead birds and feather spots found and each of the calculated biases. An ETC will be calculated for each special-status species found during the dead bird searches. The formula to determine ETC is:

ETC = TDBF + SB + RB + HB + CB,

Where ETC is the estimate of total avian collisions with the segment of line studied.

Example: if 8 birds are found during the search, then:

ETC = 8 + 2 + 2 + 0.6 + 3.15 = 15.75 birds are estimated to be killed from collisions with the wires in this segment

Habitat bias and crippling bias should be eliminated if reliable calculations are not available.

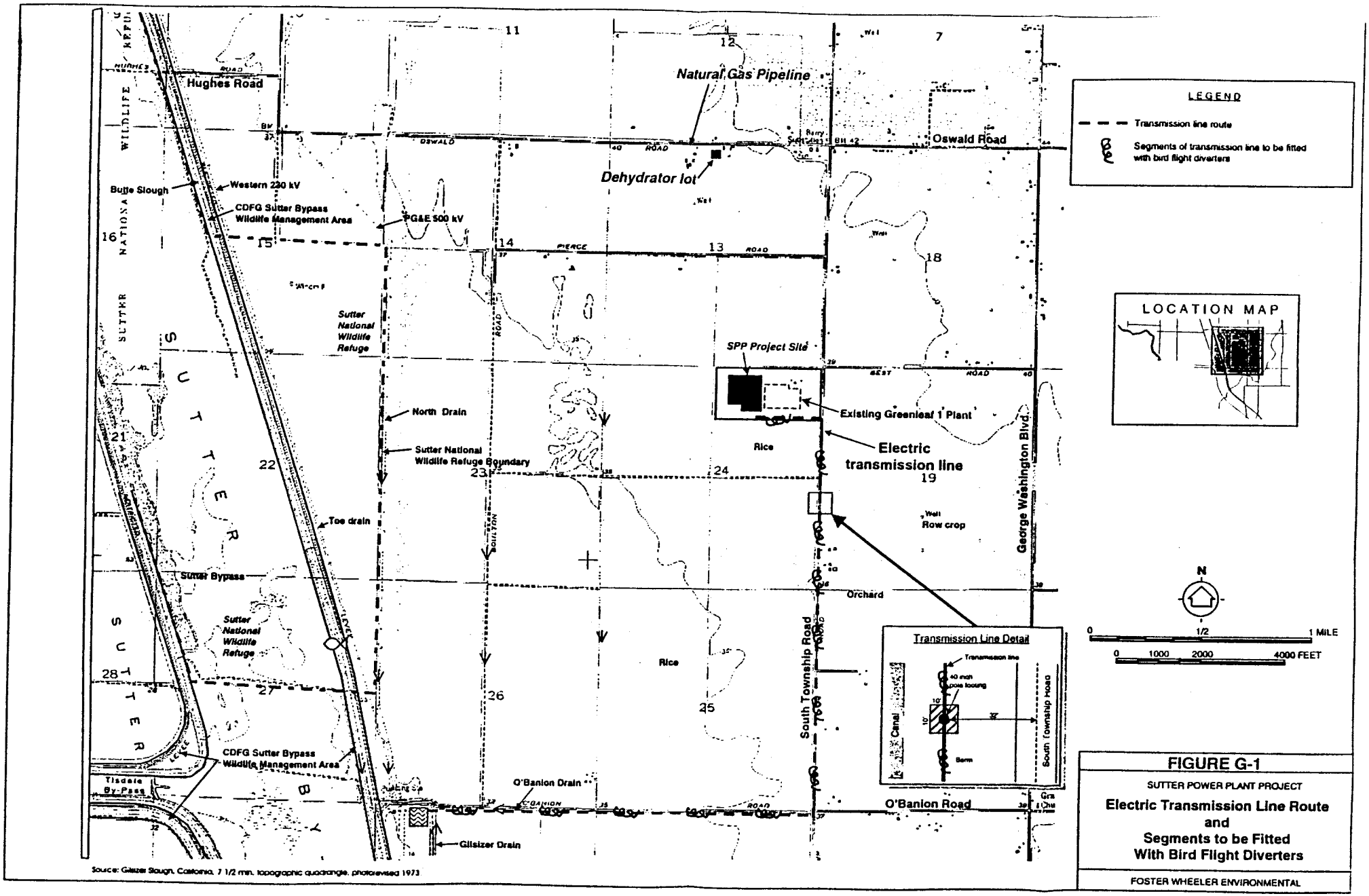
The estimate of total collisions will be determined for each special-status species and averaged over the first three-year monitoring period. The estimate of total collisions will be compared to the significance criteria set forth by the USFWS and CDFG. If the results of the dead bird searches are above the significance criteria after the first three years of monitoring, the monitoring program will continue on an annual basis and remedial actions may be implemented. If monitoring results show a decrease in the number of special-status birds incidentally taken by the project during the first three years or over the following three years, Calpine will ask for a decrease in frequency or cessation of monitoring. If during the dead bird searches large numbers of migratory and/or special-status birds are recorded during the dead bird searches, the USFWS, CDFG, and CEC will be notified immediately.

REMEDIAL ACTIONS

If it is determined by Calpine and verified by the USFWS, CDFG, and CEC that the electric transmission line and/or HRSG stacks causes significant impacts to migratory and special-status birds, remedial actions to decrease the incidental take at or below the significance criteria will be implemented.

Remedial actions may include:

- Increase the number of BFDs along the top ground wires,
- Add BFDs to the conductor wires,
- Implement a study plan to determine the cause of excess avian collisions,
- Provide off-site compensation of breeding habitats, and/or
- Reinitiate formal consultation with USFWS and/or CDFG.



Source: Gilsizer Slough, California, 7 1/2 min. topographic quadrangle, photorevised 1973

FIGURE G-1

SUTTER POWER PLANT PROJECT

Electric Transmission Line Route and Segments to be Fitted With Bird Flight Diverters

FOSTER WHEELER ENVIRONMENTAL

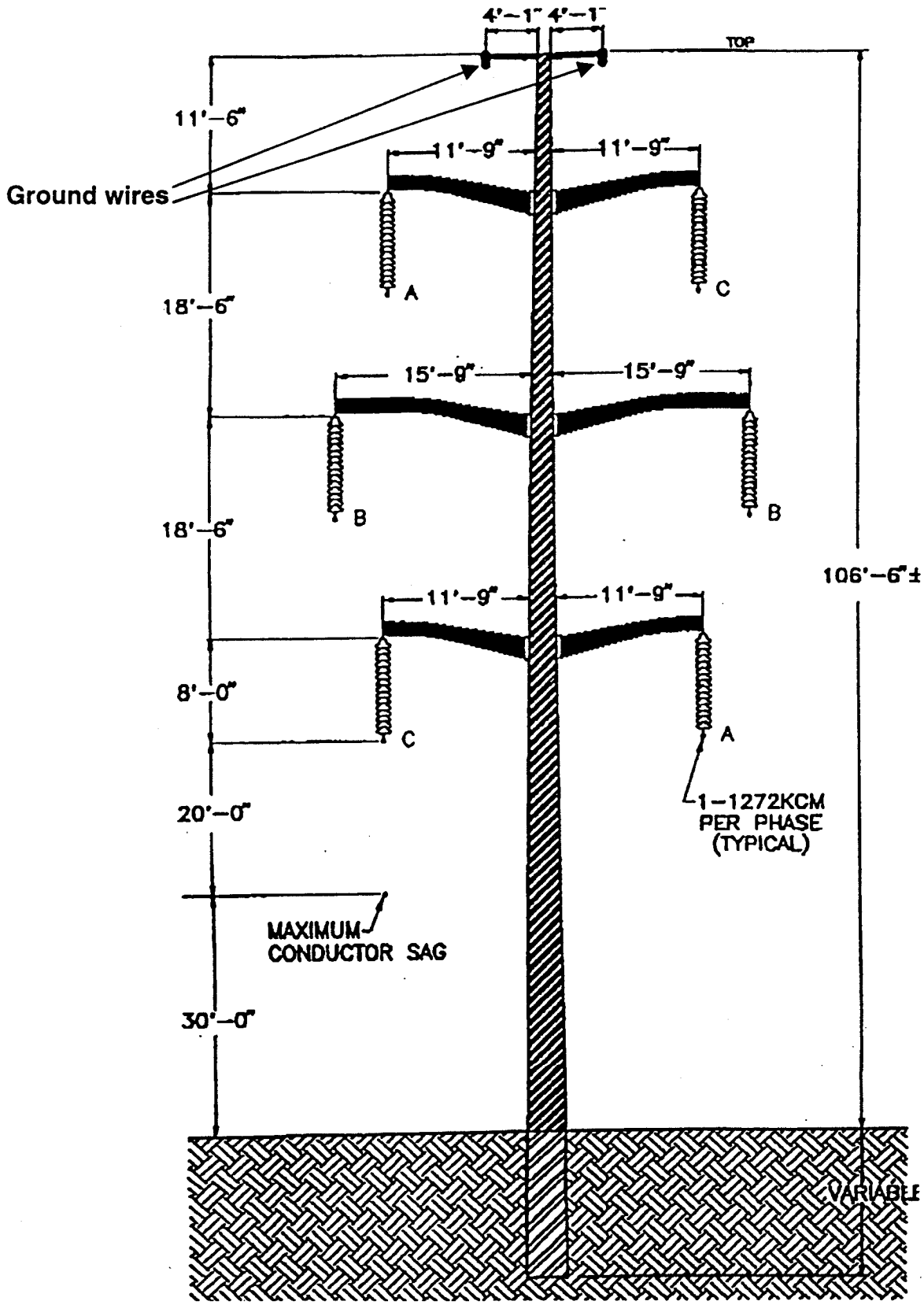
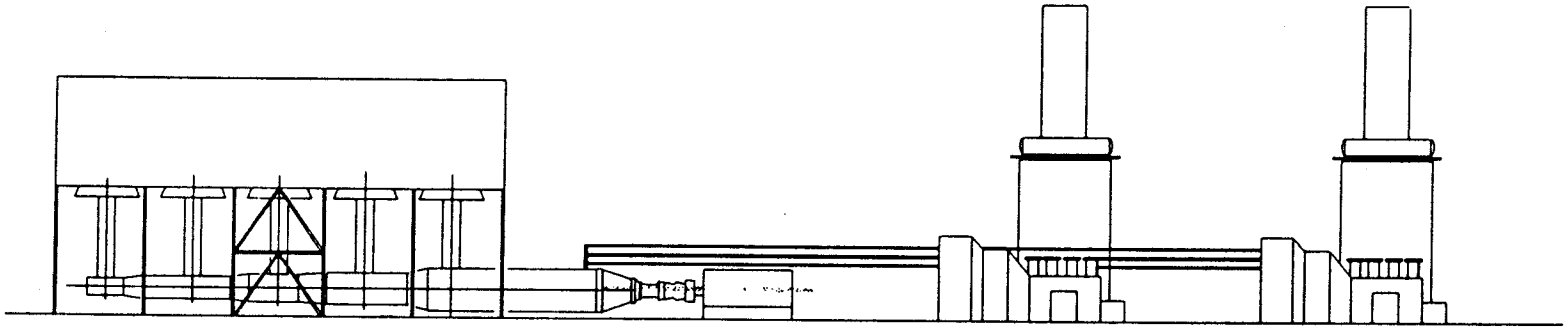


FIGURE G-2

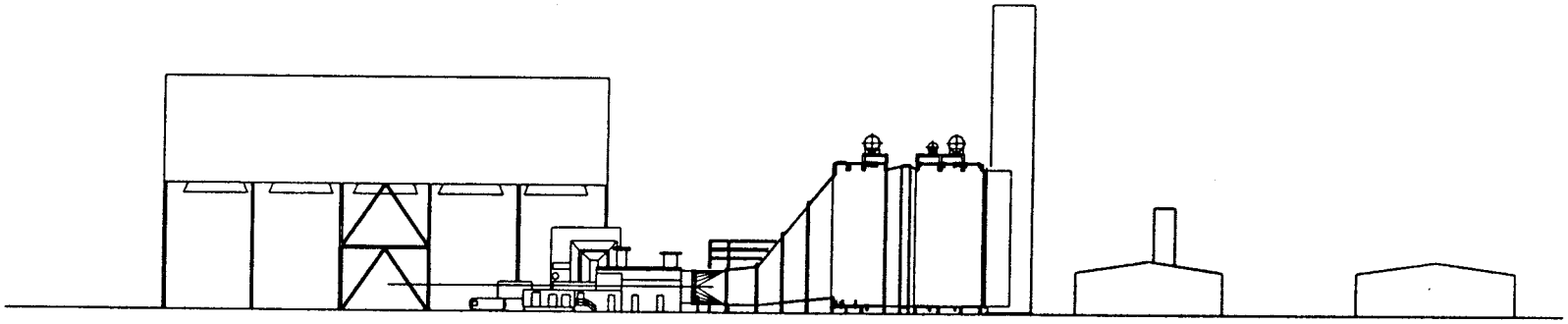
SUTTER POWER PLANT PROJECT

230kV Transmission Line Pole Design

FOSTER WHEELER ENVIRONMENTAL



ELEVATION LOOKING NORTH



ELEVATION LOOKING WEST

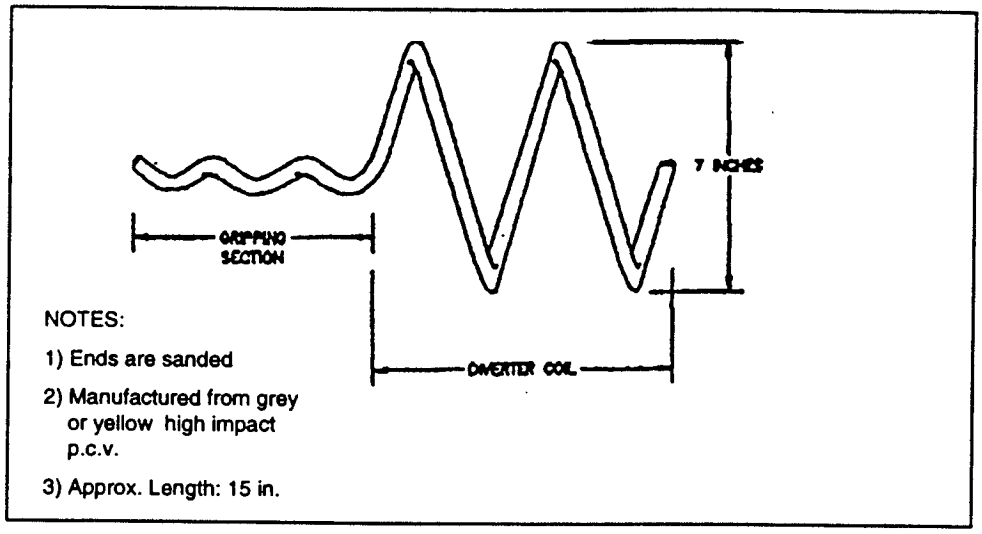
0 30 60 90 120FT

FIGURE G-3

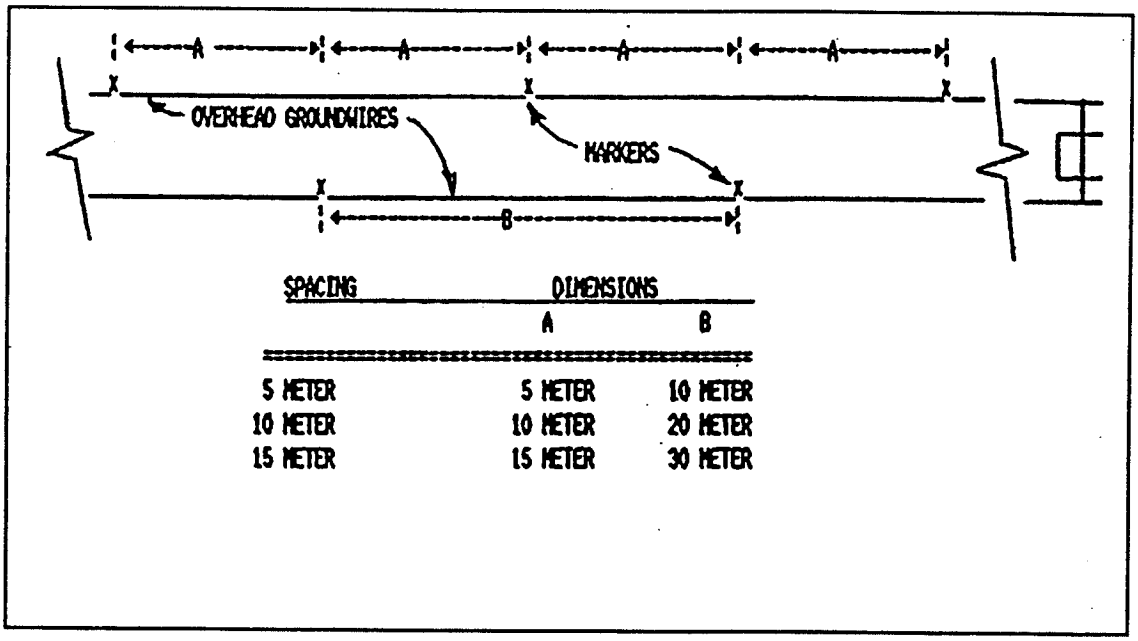
SUTTER POWER PLANT PROJECT

ELEVATIONS

Foster Wheeler Environmental



Dulmison bird flight diverter (BFD-7)



Marker spacing diagram for overhead groundwires

FIGURE G-4

SUTTER POWER PLANT PROJECT

EXAMPLE OF BIRD FLIGHT DIVERTER AND SUGGESTED SPACING ON GROUND WIRES

FOSTER WHEELER ENVIRONMENTAL

Figure G-5. Avian Collision Data Sheet.

Project: Survey objective: Page____of____

Date: Observer(s): Individual search bias:

T-line segment: Time start:

Equipment: Time end:

Weather conditions:

(wind direction/speed, precipitation, visibility, cloud cover, temperature)

Time	Location ID on Map	Species	Sex	Age	Approximate Time of Death	Physical Condition	Probable Cause of Death	Remarks

REFERENCES

APLIC (Avian Power Line Interaction Committee). 1994. Mitigating Bird Collisions with Power Lines: The State of the Art in 1994. Edison Electric Institute. Washington, D.C.

Brown, W., and Drewien, R. 1995. Evaluation of Two Power Line Markers to Reduce Crane and Waterfowl Collision Mortality. Wildlife Society Bulletin, 1995. 23(2): 217-227.

APPENDIX H—CONDITIONS OF CERTIFICATION

(forthcoming)

1. CALIFORNIA ENERGY COMMISSION CONDITIONS OF CERTIFICATION FOR BIOLOGICAL RESOURCES
2. CLEAN WATER ACT SECTION 404 PERMIT
3. CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD WATER QUALITY CERTIFICATION (CWA SECTION 401 PERMIT)
4. CALIFORNIA DEPARTMENT OF FISH AND GAME MEMORANDUM OF UNDERSTANDING
5. CALIFORNIA DEPARTMENT OF FISH AND GAME STREAMBED ALTERATION AGREEMENT OR WAIVER
6. UNITED STATES FISH AND WILDLIFE SERVICE AND NATIONAL MARINE FISHERIES SERVICE BIOLOGICAL OPINIONS

Appendix 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

Sierra Nevada Customer Service Region

STATE OF CALIFORNIA

Energy Resources Conservation
And Development Commission

In the Matter of:	)	Docket No. 97-AFC-2
Application for Certification for the Sutter Power Plant Project	)	BRIEF ON VISUAL RESOURCE IMPACTS

I. INTRODUCTION

Staff evaluated both the power plant and the transmission line for their impacts on visual resources. Staff determined that both the line and the power plant would cause significant impacts. With mitigation measures, including foliage screening, painting, and eliminating the steam plume with dry cooling, Staff concluded that the impact of the power plant itself was less than significant. (RT, 145:19.)[1] However, even after all mitigation agreed to by Calpine was applied, the impact of the transmission line would still be significant. (RT 145:20-23.)

Staff and Calpine each considered additional mitigation that might reduce the visual impact to less than significant levels. Measures considered included undergrounding the line, undergrounding the 12kV and 69kV lines on the opposite side of South Township Road, and an alternative transmission line route that would avoid South Township Road and O'Banion Road altogether. (RT 145:24-26.)

Upon investigation, each of these mitigation measures proved either infeasible or undesirable. (RT 146:1-10.) Undergrounding the transmission line would be significantly more expensive, and the Western Area Power Administration (WAPA) indicated that it would not be willing to build or operate such a line. Undergrounding the Pacific Gas & Electric (PG&E) lines on South Township Road was also expensive and probably infeasible, given that it is contrary to PG&E's policy to underground 69 kV lines. The alternative route across fields west of the power plant would have had impacts on agriculture and biological resources, including higher mortality to various birds (including state and federally listed species) because of proximity to the Sutter

[1] RT refers to the November 16, 1998, Reporter's Transcript unless a different date is indicated. Where a colon appears, the number preceding it is the page number; the number following the colon is the line number.

National Wildlife Refuge and the crossing of seasonally flooded rice fields. (See Exh. 51, p. 281.)

Acknowledging the limits of mitigation measures, Staff ultimately concluded that the impact of the transmission line to visual resources was "significant" under the California Environmental Quality Act (CEQA). Calpine provided its own assessment, concluding that the impact was "less than significant." The disagreement is addressed in this brief.

II. THE VISUAL IMPACT OF THE TRANSMISSION LINE IS SIGNIFICANT.

A. The landscape includes sensitive scenic resources.

The project viewshed is rural in character, with rice fields and orchards the prevalent agricultural elements. (FSA, p. 255.) The WAPA 230 kV and PG&E 500 kV transmission lines are visible from South Township Road, but are more than two miles distant, near the Sutter Bypass. (Ibid.) Sutter County describes the roadways along the nearby Sacramento River as "visually and aesthetically scenic." (FSA, p. 259.) The dominant physical feature in the area is the geographic formation known as the Sutter Buttes, which are visible from the viewshed. (Ibid.) Although there are no scenic roads or corridors in the project vicinity, views that include the Sutter Buttes are generally of high quality, and the scenic value of the Buttes is recognized in the County General Plan. (Ibid.)

The transmission line would run south from the power plant for about two miles adjacent to South Township Road, then turn west for approximately two miles adjacent to O'Banion Road. There are residences on South Township Road and east of South Township Road on O'Banion Road that will view the line, and whose view of the Sutter Buttes will be at least partly obstructed by the line. (FSA, p. 346, RT 163.) Sensitive receptors include not only residents in the area but travelers on the roads. (FSA, p. 259.)

B. The transmission line would be visually dominating from the vicinity of South Township and O'Banion roads.

The Staff analyzed visual impacts through the use of "Key Observation Points," or "KOPs", which are used to represent visual impacts from different general perspectives. (FSA, p. 259, 314.) Staff determined that the transmission line would cause a significant visual impact on the view area represented by KOP 5, the perspective from approximately 200 yards south of O'Banion on South Township Road. (FSA, p. 266.)

The visual impact at KOP 5 is depicted in visual simulations provided by the applicant. (See FSA, Vis. Res. Fig. 16; Priestley, Fig. Vis-12.) Currently, the only visual element rising above local orchards and residences is the wooden-

pole PG&E line, with poles less than 50 feet in height. (See FSA, Vis. Res. Fig. 15.) The proposed transmission line will become a new, dominating visual element more than 100 feet in height and with arms more than 30 feet across. (Exhibit 46.) The change in view created by the line will therefore be significant to viewers in the KOP 5 area, including the residents at the corner, residents further east from the corner, and travelers. (RT 156.)

The poles for the transmission line will be directly in the view of the Sutter Buttes for residents at the corner of O'Banion and further east on O'Banion. (RT 163-165, 12/1 RT 184-185.) For road travelers north from the intersection, the new poles "would cause a tunnel view effect," with overhead lines on both sides of the road on poles that contrast in form and scale. (FSA, p. 344.) These visual changes are "a substantial adverse effect on a scenic vista," and will "substantially degrade the existing visual quality of the site and its surroundings," two CEQA Guideline criteria for determining whether a visual impact is significant. (Cal. Code of Regs., tit. 14, Appendix G.)

III. CALPINE'S CRITICISMS OF THE STAFF'S CONCLUSIONS ARE WITHOUT MERIT.

A. Calpine's visual analysis is neither objective nor replicable by other analysts.

Calpine provided their own witness to challenge the Staff's conclusion that the visual impact was significant. His testimony criticized the Staff methodology and provided a different assessment, concluding that the impact was less than significant.

Calpine's witness criticized the Staff's method for being based on the Bureau of Land Management's (BLM) method. (Exh. 26, p. 57.) The basis for this criticism was never revealed, nor did the witness identify a published method he considered superior. (Ibid.) His criticism of Staff's use of the BLM method apparently concerns the use of matrices that assign ratings to different landscape features, while failing to "specify the criteria or thresholds that would allow another rater to apply the system." (Ibid.)

Calpine's argument implies that the Staff method is too simple, and needs even more criteria and elaboration to achieve replicability by other users. Yet, rather than offering a more sophisticated and objective approach, Calpine's witness provided instead an amorphous "overall landscape context". (Exh. 26, p. 58.)

This approach is not discussed in the published literature (RT 85-86), nor are there any identified rules, guidelines, or criteria for its application. (RT 84-86.) Under questioning, the Calpine witness could not describe how another

analyst would apply his approach. (See RT 80-85.) Important assumptions about such criteria as viewer sensitivity and scale dominance are not disclosed in the analysis, making it a "black box." (RT 148-149.) There is absolutely no evidence in the record supporting Calpine's suggestion that its seat-of-the-pants assessment is more objective and replicable than the BLM-based approach used by Staff.

A major problem with Calpine's "overall" approach is that it fails to assess the visual dominance of the line for viewers in the vicinity of KOP 5. (RT 81-83.) Likewise, it failed to even mention the "tunneling effect" of the view from KOP 5. (RT 72:17-18.)

This omission is significant, in that Calpine's visual analyst predecessor had identified this visual effect as "moderate to high." (Exh. 10, Vis. Res. Data Request No. 6.) This assessment was based on "the visibility of two different transmission poles, the smaller existing wooden poles along the east side of South Township Road and the larger proposed steel poles along the west side."" (Ibid.) No other impact was identified by Calpine as "moderate to high" in significance. (11/16 TR 74-75.) Thus, while Calpine's earlier analyst labeled this impact as the most severe impact associated with the transmission line, Calpine's witness did not even address it in his testimony. (RT 72:18, 159.)

B. Calpine's basis for concluding that the impact is less than significant is based on criteria that are illogical.

Calpine's conclusion that the impact of the line from KOP 5 would be less than significant is based on reasoning that does not withstand scrutiny. The heart of that reasoning is on pages 67 and 68 of Exhibit 26, where Calpine provides the reasons it does not believe the visual impact to be significant.

1. "Power lines of varying voltage are visually prominent and not unexpected elements in rural portions of the Sacramento Valley landscape region."

This statement, while true, is irrelevant to the issue of whether the project transmission line has a significant impact on visual resources. "Visual prominence," which the applicant agreed means "conspicuous, highly visible" (RT 48:6), is entirely consistent with a significant impact. Likewise, that a given construction is "not unexpected" is totally irrelevant to impact significance. In modern society all sorts of projects—new freeways, high rise buildings, shopping malls, television towers—are "not unexpected." Yet this scarcely diminishes their visual impact, nor does it render such impact less than significant.

The statement is also potentially misleading in that it fails to distinguish distribution lines (carried on small poles similar to telephone poles) from large transmission lines (i.e., 230 kV and above) that require much larger metal structures to carry their conductors. (RT 153-154.) Other than the PG&E and WAPA transmission lines two miles west of the project, Calpine's witness could not name any other major transmission lines in the project vicinity. (RT 64.)

Finally, this criterion indicates the underlying flaw of the amorphous "overall" approach used by Calpine's witness. The significance of an impact must be tied to the impact on viewers and locations. It needs to consider the dominance of the new element in the visual context. To label something "not unexpected" says little meaningful about its visual impact.

2. "The proposed alignment of the transmission line with the roads and other features of the areas rectilinear landscape would make them consistent with the overall structure of the areas landscape."

Ironically, "rectilinear alignment" actually serves to increase the visual impact of transmission lines to all but birds and aviators. This is because these alignments usually follow roadways, and roadways increase the number of sensitive receptors in the form of travelers and residences. (TR 52-53, 155:20-24.)

3. "Very small numbers of viewers would be affected."

Calpine's witness acknowledged that his analysis does not specify how many viewers must be affected for an impact to be significant. (RT 91.) He was unable to identify any policy, rule, or guideline in CEQA or the National Environmental Policy Act setting a minimum number of viewers for a finding of significance. (RT 89-90.) He was unaware of any public agency having adopted "thresholds of significance" regarding numbers of affected viewers (RT 90), and was unaware of any BLM policy regarding viewer numbers. (Ibid.)[2]

4. "The scenic qualities of this area have not been given formal or informal recognition and are not subject to any plans, policies, or regulations designed to protect them."

While relevant, this factor is only one of many that is important for determining impact significance. (RT 156.) Calpine's witness acknowledged that most visual resources are not subject to such formal protection. (RT 60-61.) He further acknowledged that formal recognition is not essential for an impact to be significant. (RT 60.)

[2] In fact, the BLM method would allow impacts to be described as unacceptable even where the number of viewers is quite small. (TR 152:15-21.)

As Calpine acknowledged, most of the world's visual attributes have not been formally assessed or protected, be they in small neighborhoods or the countryside. This hardly prevents them from having scenic value, or from having that value impaired by new, visually dominant projects. The County's General Plan gives formal recognition to views of the Sutter Buttes in the General Plan (FSA, p. 259); however, this recognition occurred only in 1996. (12/1 RT 187.) Presumably such values existed before formal recognition.

5. "The steel pole towers have a form that would make them consistent with the forms of the many wood poles that align roads in the area."

The opposite is true. The proposed structures would include three large crossarms to carry the six conductors as well as a smaller crossarm to carry the two shield wires. (RT 157; Exh. 46.) By contrast, the existing poles have only two relatively short crossarms carrying only small conductors. (Ibid.) Most important, the new steel poles will be much larger than the existing wooden poles—more than doubling their height. (Ibid.)

Calpine's contention is belied by the comparison of the new and existing transmission lines on South Township Road depicted in Exhibit 46. The contrast between the new and old poles is in reality even greater than depicted in Exhibit 46, in that the exhibit illustrates only scale. The difference between wood and steel poles makes the contrast between the exiting poles and the new poles even greater.

IV. CONCLUSION

Appendix G of the CEQA Guidelines asks the analyst to evaluate whether the project would "have a substantial adverse impact on a scenic vista." Staff has concluded that the transmission line on South Township Road would have such an impact on viewers who live and drive in the vicinity of KOP 5. The views of the Sutter Buttes from this area are without doubt a scenic vista. The evidence indicates that the transmission poles will obstruct that vista for residents in the KOP 5 area and travelers headed north from KOP 5.

Calpine has criticized the Staff approach, contending that it harbors unclear assumptions that make it hard to replicate. Yet it offers no real alternative, presenting only an entirely subjective "overall" analysis that is impossible for an analyst to replicate. The criteria Calpine sets forth for finding "less than significant" impacts do not, when scrutinized, make sense.

The Staff visual analysis is a conventional analysis based on the predominant model used for this purpose. It arrives at a common-sense result that is best verified by

standing at the corner of South Township and O'Banion Roads and imagining the visual impact of a transmission line of the magnitude proposed.

Dated: December 9, 1998

Respectfully submitted,

DICK RATLIFF
Senior Staff Counsel

Appendix L

Department of Interior
Letter to Western;
Dated Jan. 6, 1999

Sierra Nevada Customer Service Region

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
600 Harrison Street, Suite 515
San Francisco, California 94107-1376

January 6, 1999

ER 98/734

Loreen McMahon
Environmental Project Manager
Sierra Nevada Region
Western Area Power Administration
114 Parkshore Drive
Folsom, CA 95630-4710

Dear Ms. McMahon:

The Department of the Interior has reviewed the Draft Environmental Impact Statement (DEIS) for the Sutter Power Project, Sutter County, California, and has no comments to offer.

Thank you for the opportunity to comment on this document.

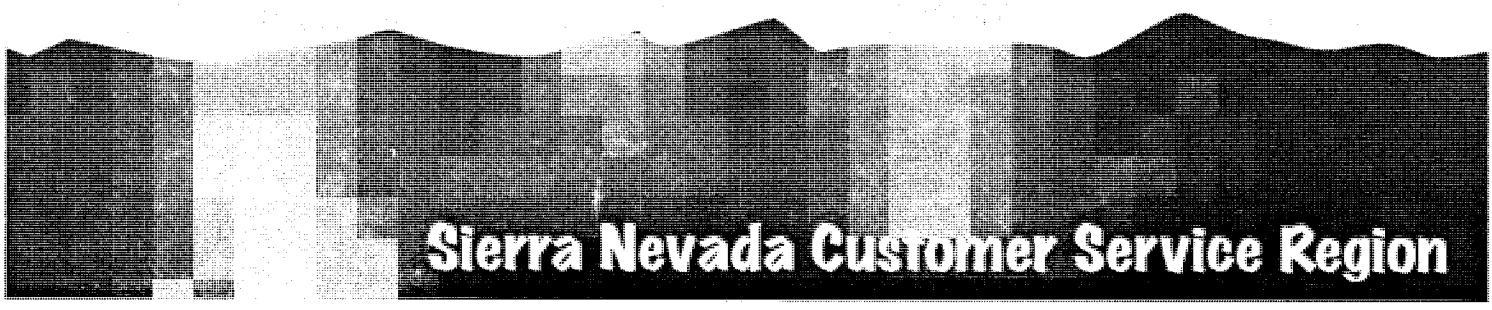
Sincerely,

Patricia Sanderson Port
Regional Environmental Officer

cc: Director, OEPC (w/orig. incoming)
Regional Director, FWS, Region I
Paul Richins, Project Manager, California Energy Commission

Appendix M

Calpine Corporation Letter to California Energy Commission Regarding Process Water Mitigation; Dated Feb. 26, 1999



CALPINE

SUTTER POWER PLANT
POST OFFICE BOX 3330
YUBA CITY, CALIFORNIA 95992
530.821.0180
530.671.7435 (FAX)

February 26, 1999

Mr. Paul Richins
Project Manager
California Energy Commission
1526 9th Street, MS-15
Sacramento, CA 95814-5512

Subject: 97-AFC-2 (Sutter Power Plant) – Process Water Mitigation

Dear Mr. Richins:

Calpine Corporation has made a decision on how it will handle the process water generated from the Sutter Power Plant. In September 1998 we proposed a mitigation package that included a Dry Cooling Tower and zero discharge program. However, at that time we had not decided on which of the three possible methods would be used to "dispose" of the process water. The following outlines the processes that will be utilized:

Make-up Water

Make-up water for the steam cycle will be derived from a water treatment system utilizing a combination of Multimedia filters, Reverse Osmosis Membranes, degasifier, and an offsite regenerated demineralizer system. These components are all proven technologies regarding performance and reliability. The offsite regeneration of the demineralizer negates the need for the acid and caustic storage and handling systems to be on the site. The demineralized water will be stored in a 126,000-gallon stainless steel storage tank, providing over 24 hours of storage at base load operation.

Wastewater

Wastewater from the plant will be handled in two ways with most of the wastewater being recycled. That which is not recycled will be directed to the zero discharge treatment system. The recycled wastewater which includes the multimedia filter backwash, evaporative cooler (Combustion Turbine inlet air cooler) blowdown, plant equipment drains, and the boiler blowdown will go to a settling basin, where the solids will settle out of the water. The water discharge from the settling basin will be directed back into the water supply, upstream of the water treatment system.

The wastewater from the water treatment system will be forwarded to the zero discharge system. This system includes an evaporator, which converts most of the water into steam that is returned back into the steam system. The effluent from the evaporator is converted to a cake by a crystallizer. The cake will be sent to a landfill along with the facility's normal solid waste

disposal. Other power plants with similar zero discharge systems confirm the non-hazardous classification is likely. If, during the operation of the plant, the waste were determined to be hazardous, the waste would be sent to a hazardous waste landfill.

Sanitary waste

The sanitary waste will be processed in an on-site packaged sewage treatment plant. The effluent reclaimed water from the plant will be recycled back to the water treatment system.

Potable water/ Domestic water

A domestic water supply system will supply water throughout the plant for lavatories, eye wash stations, etc. The domestic water is raw well water that is chlorinated and filtered. Calpine will provide bottled water for drinking purposes.

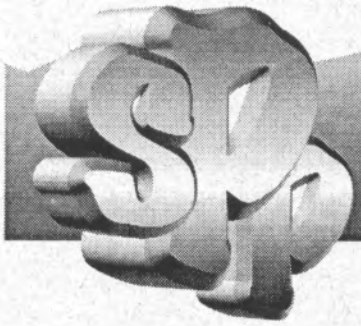
Please call me at 707-527-6700, ext. 727 if you have any questions or need more information.

Sincerely,

Charlene L. Wardlow

Charlene L. Wardlow
Environmental Manager

cc: CEC Docket Unit (12 copies + original)
Sutter Power Plant Service List



Appendix N

State of California,
Office of Historic Preservation (SHPO)
Letter to Western;
Dated March 2, 1999

Sierra Nevada Customer Service Region

STATE OF CALIFORNIA – THE RESOURCES AGENCY GRAY DAVIS, Governor

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
P.O. BOX 942896
SACRAMENTO, CA 94296-0001
(916) 653-6624 Fax (916) 653-6624
calshpo@mail2.quiknet.com

March 2, 1999

Reply To:WAPA981217X

Ms. Loreen McMahon
Environmental Project Manager
Department of Energy
Western Area Power Administration
114 Parkshore Drive
Folsom CA 95630-4710

Re: Sutter Power Project, Yuba City Vicinity

Dear Ms. McMahon:

Thank you for consulting me about the subject undertaking in accordance with 36 CFR Part 800, regulations implementing Section 106 of the National Historic Preservation Act.

Your recent letter also attempted to address the questions I had asked about the timing of the Section 106 consultation process relative to release of the DEIS. You may recall that my comments emphasized the propriety and advantages of initiating the Section 106 consultation process as far in advance of DEIS release as possible in order to demonstrate that a federal agency is implementing in good faith the requirements of 36 CFR § 800.1(b) pgrph. 2 and 36 CFR § 800.3(c).

You accounted for the timing issue I raised largely by saying that timing was a consequence of the way in which the California Energy Commission regulates power plant siting. However, your letter does not dissuade me from thinking that this issue also exists in part because of WAPA's deferential accommodation to the Commission's process. This accommodation is clearly of concern to me.

Pursuant to 36 CFR 800, WAPA has notified me that the undertaking will affect no historic properties. I assume that what WAPA may in fact have meant to say was that there are no historic properties that may be affected by the undertaking (36 CFR § 800.4[d]). Please let me know if my interpretation is incorrect.

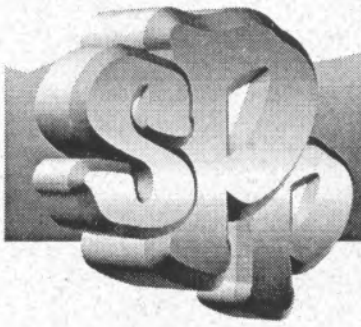
Based on my review of the documentation submitted, I do not object to WAPA's determination. However, I suggest that conducting consultation with Native Americans exclusively by letter is not reasonable or sufficient. I saw no evidence in your submittal that any follow-up efforts were made to contact Native Americans by other means.

Page 38 of the Foster-Wheeler report lists conditions of certification imposed by the Commission to address potential project impacts on cultural resources. In view of WAPA's "no properties" determination, I do not understand why the Commission's conditions include provisions for anything other than monitoring and addressing discovery situations. Is the condition pertaining to pre-construction reconnaissance and staking intended to address minor alignment changes of some sort? If not, then what is the purpose of this condition?

I appreciate this opportunity to comment on the undertaking. If you have any questions, please call Hans Kreutzberg at 653-9107.

Sincerely,

Daniel Abeyta, Acting
State Historic Preservation Officer



Appendix O

Complete Table of Conditions of Certification for the SPP (from Draft EIS, Presiding Members Decision and the Revised Presiding Members Proposed Decision)

Sierra Nevada Customer Service Region

California Energy Commission's
Conditions of Certification
Revised Presiding Members Proposed Decision
March, 1999

COC #	Description	Verification
	NEED CONFORMANCE (NO CONDITIONS)	
	AIR QUALITY	
AQ-1	As part of the requirements for Condition SOIL&WATER-3 for the preparation of a grading and erosion control plan for the project site, the project owner shall include and identify in that plan the following: ▪ the location of all paved roads, parking and laydown areas; ▪ the location of all roads, parking areas and laydown areas that are surfaced with gravel; ▪ the location of all roads, parking areas and laydown areas that are treated with magnesium chloride dust suppressant or equivalent; and ▪ the location of all dirt storage piles	At least 30 calendar days prior to the start of grading on the project site, the project owner shall submit for review and approval to the Commission Compliance Project Manager (CPM) in writing, and with construction drawings, a City/County of Sutter-approved erosion and sediment control plan. This plan shall include the delineation of the control measures discussed above for all roads, parking areas and laydown areas, and the location of all dirt storage piles.
AQ-2	The project owner shall perform the following mitigation measures during the construction phase of the project: a. The areas of disturbance within the construction site shall be watered so that they are visibly wet, twice or more daily, as necessary. This condition shall not apply on rainy days when precipitation exceeds 0.1 inch. b. Any graded areas where construction ceases shall be treated with a magnesium chloride (or equivalent) dust suppressant within fifteen days, or sooner if windy conditions create visible dust beyond the project site boundary. c. Magnesium chloride (or equivalent) dust suppressant or fabric covers shall be applied to any dirt storage pile within three days after the pile is formed, or sooner if windy conditions create visible dust beyond the project site boundary. d. Prior to entering public roadways, all truck tires shall be visually inspected and, if found to be dirty, cleaned of dirt using water spraying or methods of equivalent effectiveness, subject to CPM approval. e. At least 500 yards from construction site entrances, public roadways shall be cleaned on a weekly basis, or when there are visible dirt tracks on the public roadways, by either mechanical sweeping or water flushing. f. A speed limit sign shall be posted at the entrance of the construction site, to limit vehicle speed to no more than 15 miles per hour on unpaved areas. g. All construction equipment shall be properly maintained to detect and prevent mechanical problems that may cause excess emissions. h. No construction equipment shall be kept idling when not in use for more than 30 minutes.	The project owner shall maintain a daily log of water truck activities, including the number of gallons of water used to reduce the dust at the construction sites. A log or record of the frequency of public road cleaning shall also be maintained. These logs and records shall be available for inspection by the CPM during the construction period. The project owner shall identify, in the monthly construction reports, the area(s) that the project owner shall cover or treat with dust suppressants. The project owner shall make the construction site available to the District staff and the CPM for inspection and monitoring.
AQ-3	Prior to the start of construction (defined as any construction-related vegetation clearance, ground disturbance and preparation, and site excavation and soil remediation activities), the project owner shall provide the CPM with the following information: the name, telephone number, resume, and indication of availability of the on-site Environmental Coordinator. ***Protocol***: The resume shall include appropriate education and/or experience in Environmental management or coordination such as monitoring hazardous waste site remediation, experience as an inspector with an air pollution control district, or experience as an environmental health and safety project manager. The CPM will review the qualifications of, and must approve in writing, the project owner's designated Environmental Coordinator prior to the start of construction.	At least 30 days prior to the start of construction, the project owner shall submit to the CPM for review and written approval the information required above.

AQ-4	The on-site Environmental Coordinator shall be on-site every work day during site preparation. Duties: The on-site Environmental Coordinator shall inspect and ensure that all fugitive dust mitigation measures during the site preparation phase of construction are properly implemented including, but not limited to, the mitigation measures specified in Condition AQ-2. The primary responsibility of the Environmental Coordinator is to insure that no fugitive dust emissions are being emitted beyond the property line under control by the project owner.	The Environmental Coordinator will prepare a daily report of construction activities and appropriate fugitive dust mitigation measures employed by the project owner. A summary of the daily reports shall be included in the monthly compliance report to the CPM. If any complaints by the public are received, or if the project owner does not agree to comply with instructions given by the Environmental Coordinator, or if any other fugitive dust issue, in the judgment of the Environmental Coordinator, needs to be brought to the attention of the CPM, the Environmental Coordinator shall contact the CPM immediately.
AQ-5	The on-site Environmental Coordinator will exercise the authority to halt any on-site activity, temporarily stop activities, or direct activities to proceed under a modification of the mitigation requirements of Condition AQ-2, if, in the opinion of the Environmental Coordinator, the project owner is not complying with the requirements of Condition AQ-2 or fugitive dust emissions are noticed beyond the project boundary.	
AQ-6	For all utility trenching activities, the project owner shall implement the following control measures if necessary to prevent fugitive dust emissions: a. To top layer of soil shall be pre-wetted prior to excavation; b. Travel surfaces shall be wetted with the use of a water truck; and c. All exposed soil areas shall be wetted by the use of hose spraying.	District staff and the CPM may inspect utility trenching sites at any time to monitor compliance for this Condition.
AQ-7	The facility shall not discharge from any source whatsoever such quantities of air contaminants or other materials that cause a public nuisance. (District General ATC Permit Condition a).	As part of the semiannual Air Quality Reports (as required by AQ-43), the project owner shall include the date and time when any accidental release of air contaminants or other materials occur. The Air Quality Report shall also include the reason for the accidental release and measures taken to correct it.
AQ-8	The facility shall not emit particulate emissions from any single source which exceed an opacity equal to or greater than twenty percent (20%) for a period aggregating more than three (3) minutes in any one (1) hour, excluding uncombined water vapor. (District General ATC Permit Condition b).	As part of the semiannual Air Quality Reports (as required by AQ-43), the project owner shall include an explanation and the date, time, and duration of any violation of this Condition.
AQ-9	The facility shall not discharge into the atmosphere from any source particulate matter in excess of 0.3 grains per cubic foot of gas at standard conditions. When the source involves a combustion process, the concentration must be calculated to 12 per cent carbon dioxide (CO 2). (District General ATC Permit Condition c).	As part of the annual Air Quality Reports, the project owner shall submit to the District and CPM the annual source test and specify the level of particulate matter in grains per cubic foot of gas at standard conditions.
AQ-10	The facility shall not discharge in any one hour from any source whatsoever fumes in total quantities in excess of the amounts as prescribed for and shown in District's Rule 3.3 Table of Allowable Rate of Emission Based on Process Weight Rate. (District General ATC Permit Condition d).	As part of the semiannual Air Quality Reports (as required by AQ-43), the project owner shall indicate the date, time, and duration of any violation of this Condition.
AQ-11	The facility shall not discharge into the atmosphere, from any single source of emission whatsoever, any sulfur oxides in excess of 0.2 percent by volume (2,000 ppm) collectively calculated as sulfur dioxide (SO 2). (District General ATC Permit Condition e).	As part of the annual Air Quality Reports, the project owner shall submit to the District and CPM the annual source test and specify the level of sulfur oxides in percent by volume of gas at standard conditions.
AQ-12	Project owner shall not build, erect, install, or use any article, machine, equipment or other contrivance to conceal an emission which would otherwise constitute a violation of the Health and Safety Code of the State of California or of these Rules and Regulations. (FRAQMD General ATC Permit Condition f).	Refer to AQ-34 through AQ-36. The project owner shall obtain approval from the District and the CPM prior to installing any new equipment that results in releasing air contaminants.
AQ-13	Project owner shall take every reasonable precaution not to cause or allow the emissions of fugitive dust from being airborne beyond the property line from which the emission originates, from any construction, handling or storage activity, or any wrecking, excavation, grading, clearing of land or solid waste disposal operation. Reasonable precautions shall include, but are not limited to: use, where possible, of water or chemicals for control of dust in the demolition of existing buildings or structures, construction operations, construction of roadways, or the clearing of land; application of asphalt, oil, water, or suitable chemical on dirt roads, material stockpiles, and other surfaces which can give rise to airborne dusts; other means approved by the Air Pollution Control Officer. (FRAQMD General ATC Permit Condition g).	Refer to conditions AQ-1 through AQ-6.

AQ-14	In the case of shut-down or re-start of air pollution equipment for necessary scheduled maintenance, the intent to shut down such equipment shall be reported to the Air Pollution Control Officer at least twenty-four (24) hours prior to the planned shutdown. Such prior notice may include, but is not limited to, the following: a. Identification of the specific equipment to be taken out of service as well as its location and permit number; b. The expected length of time that the air pollution control equipment will be out of service; c. The nature and quantity of emissions of air contaminants likely to occur during the shut-down period; d. Measures such as the use of off-shift labor and equipment that will be taken to minimize e. The reasons that it would be impossible or impractical to shut down the source operation during the maintenance period. (FRAQMD General ATC Permit Condition h).	As part of the semiannual Air Quality Report (as required by AQ-43), the project owner shall include the dates of the equipment maintenance schedule including when each piece of equipment will be shut-down and when it will start-up.
AQ-15	In the event that any emission source, air pollution control equipment, or related facility breaks down in such a manner which may cause the emission of air contaminants in violation of any permit condition or applicable rules or regulations, other than as exempted herein, the licensee shall immediately notify the Air Pollution Control Officer of such failure or breakdown and subsequently provide a written statement giving all pertinent facts, including the estimated duration of the breakdown. The Air Pollution Control Officer shall be notified when the condition causing the failure or breakdown has been corrected and the equipment is again in operation. (FRAQMD General ATC Permit Condition i).	As part of the semiannual Air Quality Report (as required by AQ-43), the project owner shall include the date and duration of all equipment breakdowns, the cause of the breakdown, how it was corrected, and the measures that will be used to prevent the problem from occurring again.
AQ-16	Project owner shall submit an application for a Federal Operating Permit Title-V within 12 months after operational startup. (FRAQMD General ATC Permit Condition j).	The project owner shall submit to the CPM a copy of the report at the time of filing with the District.
AQ-17	Project owner shall prepare and submit to the District a Toxic Hot Spots emission inventory by the first month of August following the first full calendar year of facility operational history. (FRAQMD General ATC Permit Condition k).	As part of the semiannual Air Quality Report (as required by AQ-43), the project owner shall submit to the District and the CPM an inventory of all Toxic Hot Spots emissions.
AQ18	PSD permit must be obtained from the USEPA before commencement of facility operations. (FRAQMD General ATC Permit Condition L).	At least 90 days prior to commencement of facility operations, the project owner shall submit to the CPM a copy of the PSD permit from the US EPA.
AQ-19	The equipment is subject to the federal NSPS codified at 40 CFR Part 60, Subparts A (General Provisions), Db (Standards of Performance for Industrial-Commercial-Institutional Steam Generating Systems), and GG (Standards of Performance for Stationary Gas Turbines), Compliance with all applicable provisions of these regulations is required. (FRAQMD General ATC Permit Condition m).	As part of the first semi-annual Air Quality Report, the project owner shall submit to the District and CPM a copy of a statement of compliance with the above federal applicable provisions and regulations.
AQ-20	AQ-20 Project owner shall meet the provisions of the Federal Acid Rain Program Title-IV by filing an Acid Rain permit 24 months before operational startup and by certifying EMS or NOx and O 2 within 90 days.	The project owner shall provide the District and the CPM with a copy of the Acid Rain permit within 90 days after the permit is approved. Refer to AQ-33 for verification.
AQ-21	Project owner shall file an RMP with the Sutter County office in charge of the prevention of accidental releases prior to operational startup. (FRAQM General ATC Permit Condition o).	Refer to Hazardous Materials condition and verification HazMat-2.
AQ-22	The Authority To Construct (ATC) is not transferable from one location to another, or from one person to another without the written approval of the APCO. (FRAQMD General ATC Permit Condition p).	At least sixty days in advance, the project owner shall notify, in writing, the District and the CPM of any intended transfer of ownership or location and obtain written approval prior to any transfer.
AQ-23	District personnel shall be allowed access to the plant site and pertinent records at all reasonable times for the purposes of inspections, surveys, collecting samples, obtaining data, reviewing and copying air contaminant emission records and otherwise conducting all necessary functions related to this permit. (FRAQMD General ATC Permit Condition q).	During site inspection, the project owner/operator shall make the plant logs available to the District, California Air Resources Board (CARB), and Commission staff.
AQ-24	Project owner shall maintain a copy of all District permits at the facility. (FRAQMD General ATC Permit Condition r).	During site inspection, the project owner/operator shall make all plant permits available to the District, California Air Resources Board (CARB), and Commission staff.

AQ-25	Combustion turbine exhaust stacks shall exhaust at a height of 145 feet and the maximum diameter shall not exceed 18 feet. (FRAQMD General ATC Permit Condition s).	The project owner/operator shall make the site available for inspection to the District, California Air Resources Board (CARB), and Commission staff.
AQ-26	Project owner shall submit to the District and the Energy Commission ERC option contracts or final signed contracts for the project's ERC liability, except for PM10, as listed in condition AQ-42 prior to the Energy Commission's Final Decision on the project. (FRAQMD General ATC Permit Condition t).	At least 10 days prior to the Commission adoption of the final decision on the project, the Project owner shall have provided copies of all option contracts or signed contracts required by this Condition.
AQ-27	This condition has been deleted.	
AQ-28	Calpine has produced evidence indicating that it has an enforceable right to ERCs located in another District. These ERCs cannot be used until the District Board adopts an approving resolution and enters into an MOU with the other District. The District intends to act on the resolution and MOU as soon as practicable after CEC completes an environmental analysis document and the criteria in Section 15253, Subdivision (b) of the CEQA Guidelines are met. (FRAQMD General ATC Permit Condition v).	At least 30 days prior to the start of construction, Project owner shall provide a copy of the signed MOU to the CPM.
AQ-29	Project owner may substitute interpollutant offsets of VOCs (ROCs) for NOx at a 2.0 to 1.0 interpollutant offset ratio pursuant to Rule 10.1, Section E.2, d. (FRAQMD General ATC Permit Condition w).	The project owner shall submit to the District and the CPM a copy of the offsets calculations that satisfy AQ-42 if it chooses to use the interpollutant substitution offset ratio specified in this Condition.
AQ-30	The facility shall exclusively use California PUC pipeline quality natural gas as fuel. The fuel gas total sulfur and heat content will be determined and reported to the District by collecting and analyzing a sample on a monthly basis or by providing monthly certification of the natural gas total sulfur and/or heat content issued by the natural gas distributor. (FRAQMD General ATC Permit Condition x).	As part of the semi-annual Air Quality Report (as required by AQ-43), the project owner shall submit to the District and CPM a copy of the natural gas analysis or certification issued by the natural gas distributor to satisfy this Condition.
AQ-31	All basic and control equipment is to be operated and maintained in accordance with vendors' recommended practices and procedures. (FRAQMD General ATC Permit Condition y).	Refer to AQ-14 verification.
AQ-32	The maximum heat input allowed to each permitted internal and external combustion emissions unit, expressed in MMBtu units on a High Heating Value basis (HHV), shall not exceed the limits indicated in the table below: (FRAQMD specific ATC Permit Condition a). Emission Unit / MMBtu/hour / MMBtu/day(1) / MMBtu/year (2) CTG-1 / 1,900 / 45,600 / 16,644,000 CTG-2 / 1,900 / 45,600 / 16,644,000 Duct Burners-1 / 170 / 4,080 / 928,200 Duct Burners-2 / 170 / 4,080 / 928,200 (1) Based on 24 hour-day (2) Based on 365 days/year	As part of the semi-annual Air Quality Reports (as required by AQ-43), the project owner shall document the date and time when the hourly fuel consumption exceeds the hourly limits included in this Condition. The reports shall include a summary of hourly and daily fuel consumption in MMBtu [high heating value (HHV)] for all the cases indicated in the table above. The January Air Quality Report shall also include information on the amount of fuel consumed, in MMBtu (HHV), in the prior calendar year.

AQ-33	The following definitions and limitations shall apply: (FRAQMD specific ATC Permit Condition b). (1) Startups are defined as the time period commencing with the introduction of fuel flow to the gas turbine and ending when the NOx concentrations do not exceed 2.5 ppmvd at 15% O2 averaged over 1-hour. (2) Cold Startups are those that occur after the CTG has not been in operation for more than 72 hours. (3) For each CTG, the Cold Startup shall not exceed 180 consecutive minutes. (4) Hot Startups are startups that are not Cold Startups. (5) The maximum allowable NOx emissions for Hot and Cold Startups from each CTG shall not exceed 519 lb/day. (6) For each CTG, the Hot Startup shall not exceed 60 consecutive minutes. (7) Shutdowns are defined as the time period commencing with a 15 minute period during which the 15 minute average NOx concentrations exceed 2.5 ppmvd at 15% O2 and ending when the fuel flow to the gas turbine is discontinued. (8) For each CTG, the Shutdown shall not exceed 60 consecutive minutes (9) The maximum duration of Cold Startups per CTG shall be 150 hours per year and 39 hours per calendar quarter. (10) The maximum duration of Hot Startups per CTG shall be 250 hours per year, and 63 hours per calendar quarter. (11) The maximum duration of Shutdowns per CTG shall be 300 hours per year, and 76 hours per calendar quarter. (12) Compliance with the above yearly limits shall be calculated based on a rolling 12 month average. (13) All emissions during startups and shutdowns shall be included in all calculations of daily and annual mass emissions required by this permit. (14) For each CTG the maximum number of Duct Burner hours of operation shall not exceed 5,460 per calendar year. (15) For each CTG the maximum number of Power Augmentation Steam Injection hours shall not exceed 2,000 per calendar year. (16) For each CTG the maximum hourly emission rates (lbs/hr) (for a cold startup not to exceed 120 minutes of uncontrolled emissions) are given in the table below averaged over any rolling three hour period, except for the NOx emission rate, which will be averaged over one hour period: [see AQ-33 (16) on page 42] (17) For maximum project daily emissions (lbs./day) are given in the table below: [see Table AQ-33 (17) on page 42] (18) The maximum quarterly emissions for the facility are given in the table below: [see Table AQ-33 (17) on page 42] (19) The maximum annual calendar year emissions (tons/year) for the facility are given in the table below: [see Table AQ-33 (19) on page 42]	As part of the semi-annual Air Quality Report (as required by AQ-43), the project owner shall provide all data required in this Condition. In the semi-annual Air Quality Reports (as required by AQ-43), the project owner shall indicate the date, time, and duration of any violation to the NO x, and VOC limits presented in this Condition. The project owner shall include in the semi-annual Air Quality Reports (as required by AQ-43) daily and annual emissions as required in this Condition.
AQ-34	The BACT emission limits (including duct burner emissions) specified in Conditions (a), (b), (c), (d), and (e) apply under all operating load rates except during CTG startups and shutdowns, as defined in Condition AQ-33. (FRAQMD specific ATC Permit Condition c). (a) NOx emission concentrations shall be limited to 2.5 ppmvd @ 15% O2 on a 1 hour rolling average (based on readings taken at 15 minute intervals) and with a maximum of 10 ppmvd ammonia slip. (b) CO emission concentrations shall be limited to 4.0 ppmvd @ 15% O2, on a calendar day average. (c) VOC emission concentrations shall be limited to 1 ppmvd @ 15% O2, on a calendar day average. (d) PM10 emissions shall be limited to 11.5 pounds per hour, on a calendar day average. (e) SO2 emission concentrations shall be limited to 1 ppmvd @ 15% O2, on a calendar day average.	At least sixty (60) days before conducting a source test, the project owner shall submit to the District and the CPM for their review, a detailed performance annual source test procedure designed to satisfy the requirements of this Condition. The project owner shall incorporate the District's and Commission's comments on or modifications to the procedure if any are received. The project owner shall also notify the District and the CPM within seven (7) working days before the project begins initial operation and/or plans to conduct source tests as required by this Condition. All source test results shall be submitted to the CPM and District within 30 days of the date of the tests.

AQ-35	Each CTG set exhaust vent stack shall be equipped with NOx and % oxygen (O2) CEMs in order to analyze and record exhaust gas flow rate and concentrations. CO, PM10, SO2, and VOC emissions shall be monitored by the CEMs, using source test derived algorithms as indicated in AQ-36 below. In the event that test results show that CO emission limits are exceeded, the APCO may require CEMs for recording concentrations of CO. (a) The NOx CEMs shall have the capability of recording NOx concentrations during all operating conditions, including startups and shutdowns. **(b)** Relative accuracy testing shall be performed on the CEMs on a semi-annual basis or as required by the Acid Rain permit provisions in Title 40, CFR, Part 75, Appendix B. (FRAQMD specific ATC Permit Condition d).	At least one hundred and twenty (120) days before initial operation, the project owner shall submit to the District and the CPM a continuous emissions monitoring procedure. Within sixty (60) days of receipt of the procedure, the District and the CPM will advise the project owner of the acceptability of the procedure. Based on the results of the source test identified in AQ-36, the District and CPM may require CEMs for recording concentrations of CO.
AQ-36	Within ninety days after the start of commercial operation of the SPP, source testing shall be performed to determine the mass emission rates and concentrations of NOx, CO, VOC, and SO2 emissions at four different steady-state CTG load rates over the expected operating range of either combustion turbine, as required by 40 CFR 60.335.c (2). The source testing will be used to determine compliance with the permitted emission limits indicated in Specific ATC Permit Conditions AQ-33 and AQ-34. Source testing shall be conducted to determine PM10 mass emissions and concentrations while the CTG is operating at 100 percent load with and without the duct burners, firing at the maximum rated capacity or 170 MMBtu/hr (HHV), whichever is greater. (a) The source testing results shall be used to develop predictive emission algorithms to estimate mass emission rates for CO, VOC, and SO2, and PM10 emissions. (b) Source testing to determine the mass emission rates and concentrations of NOx shall be conducted annually after the initial source test indicated in a) above. **(c)** Source testing to determine the mass emission rates and concentrations of CO, VOC, SO2 and PM10 shall be conducted annually. The Air Pollution Control Officer may waive annual source testing requirements if prior test results indicate an adequate compliance margin has been maintained. (FRAQMD specific ATC Permit Condition e).	At least sixty (60) days before the start of commercial operation of the project, the project owner shall submit to the District and the CPM for review a detailed performance test procedure necessary to comply with this Condition. The project owner shall incorporate the District and CPM's comments on or modifications to the procedure. At least sixty (60) days prior to any subsequent annual compliance source tests, the project owner shall submit to the District and the CPM for review any proposed changes to the original source test procedure. The project owner shall incorporate the District's and CPM's comments on or modifications to the annual source test procedure. The project owner shall also notify the District and the CPM within seven (7) working days before the project begins initial operation and/or plans to conduct source testing as required by this Condition. Source test results shall be submitted to the District and the CPM within 30 days of the date of the tests.
AQ-37	Source tests to determine ammonia slip shall be conducted within ninety days after commercial operation of the SPP and thereafter as required by the APCO. (FRAQMD specific ATC Permit Condition f).	Please refer to AQ-36 verification.
AQ-38	Verification: The maximum allowable ammonia injection rate to each of the SCR systems shall be 25 pounds per hour under normal operating condition. This injection rate may be adjusted based on source tests results. (FRAQMD specific ATC Permit Condition g).	Please refer to AQ-34 verification.
AQ-39	Verification: Within ninety days after beginning commercial operation of the SPP, cold startup, hot startup, and shutdown source tests shall be conducted to determine the emissions of CO and NOx. The APCO may approve the use of the NOx CEMS readings in lieu of source testing if annual Relative Accuracy Testing Audits (RATA) testing is provided. (FRAQMD specific ATC Permit Condition h).	Within ninety days after the start of commercial operation of the project, the project owner shall submit to the District and the CPM for review a detailed performance source test procedure designed to satisfy the requirements of this Condition. The project owner shall incorporate the District's and Commission's comments on or modifications to the procedure. The project owner shall also notify the District and the CPM within seven (7) working days before the project begins commercial operation and/or plans to conduct source test as required by this Condition. Source test results shall be submitted to the District within 30 days of the date of the tests.
AQ-40	Records and logs of all data generated by CEMS and algorithms shall be maintained for a period of five (5) years. (FRAQMD specific ATC Permit Condition i).	During site inspection, the project owner shall make all data generated by the CEMS and algorithm, and included in the plant logs for a period of five years, available to the District, California Air Resources Board (CARB), and the Commission staff.

AQ-41	The project owner shall provide calendar quarterly reports to the District in a format determined in consultation with the District. The calendar quarterly reports shall include the following: CEMS and predictive algorithm emissions data; CTG and duct burner fuel use and operating hours; power augmentation steam injection rates and hours of operation; ammonia injection rates; emission control systems and CEMS hours of operation including the time, date, duration, and reason for any malfunctions of these systems; the number of hot startups, cold startups, and shutdowns; and the electrical and steam production rates. These data shall be averaged on a daily basis, except where required to demonstrate compliance with an emission limitation. (FRAQMD specific ATC Permit Condition j).	Within 30 days of the end of the calendar quarter, the project owner shall provide to the District and CPM the data required in this Condition.
AQ-42	Prior to the start of construction, the SPP facility must provide ERC certificates for NOx, ROC, and PM10, as indicated in the table below [see page 42]. The ERC sources are Atlantic Oil Company, Ranch A, Ranch B, Ranch C, Ranch D, Ranch E, Spreckles Sugar Company, Tri Union, and Rosboro Lumber. Alternative sources of offsets may be used if they meet the criteria applied to these sources and are approved by the District and CPM. (FRAQMD specific ATC Permit Condition k).	At least 30 days prior to the start of construction, the project owner must submit a copy of the required ERC certificates to the CPM and the District.
AQ-43	The project owner must file a semi-annual air quality report with the CPM documenting the information required by these conditions and verifications.	The semi-annual Air Quality report (as required by AQ-43) must be submitted to the CPM within 30 days of the end of the 6 month reporting period.
AQ-44	The project owner must remeasure traffic on roads used to determine PM10 mitigation at a time of year which avoids traffic volumes associated with annual rice harvest activities. Results of the remeasurement shall be reported to the CPM and the APCO for their joint determination of whether PM10 mitigation measures must be modified as a result of the additional traffic measurements.	Within 90 days of certification the project owner shall consult with the CPM and APCO on mutually agreeable time(s) of year to take the additional traffic measurements.
	PUBLIC HEALTH	
PH-1	Unless a screening health risk assessment performed by the project owner pursuant to CAPCOA Guidelines shows that health risks to the public are not significant, the project owner will require its contractor(s) to construct natural gas dehydrators using a design which vent emissions from glycol regeneration tanks through packed-chilled condensers to minimize hazardous air emissions.	Prior to construction of the dehydrators, the project owner will provide the CPM with copies of the Authority to Construct for the dehydrators from the Colusa County Air Pollution Control District and the Feather River Air Quality Management District.
	LAND USE	
LAND USE-1	Calpine's Planned Development (PD) site plan shall include agricultural buffers that comply with the Sutter County buffer design and maintenance guidelines to minimize conflicts between the industrial nature of the site and adjacent agricultural use. Calpine's PD site plan shall be submitted to the satisfaction of the Sutter County Board of Supervisors.	At least 30 days prior to the start of construction, the project owner shall submit to the Energy Commission Compliance Project Manager (CPM) a copy of the adopted PD site plan.
LAND USE-2	Development and use of the property shall be limited as set forth in the Planned Development Plan adopted by the Sutter County Board of Supervisors. Additionally, that portion of the site which is part of the Sutter Power Project (SPP) and its ancillary facilities shall be used in conformance with the certification issued by the Energy Commission. Only that portion of the site which is part of the SPP and its ancillary facilities shall be under the authority and jurisdiction of the Energy Commission. Sutter County will maintain authority and jurisdiction on the remainder of the site. Any development, land improvement, building construction or use of the land (including that pertaining solely to existing Greenleaf 1) which is not in conformity with the adopted Planned Development Plan shall be subject to subsequent approval of a planned development amendment and environmental review by Sutter County. Any development, land improvement, building construction or use of the land which is not in conformity with the adopted Planned Development Plan and which relates to the SPP or its ancillary facilities, shall be reported to the CPM to determine whether a certification amendment is necessary.	At least 30 days prior to the start of construction, the project owner shall submit to the CPM a copy of the adopted PD site plan.
LAND USE-3	Calpine shall ensure compliance with all applicable criteria of Colusa County's use permit for the dehydrator and that portion of the pipeline within Colusa County. In addition, Calpine shall ensure compliance with all applicable criteria of Colusa County's grading permit criteria (Colusa County Code Chapter 9, Ordinance No. 414 - Land Grading and Leveling). Calpine shall provide a letter from the Colusa County Planning Director stating that all applicable criteria have been satisfactorily met.	At least 30 days prior to the start of construction of the natural gas pipeline, the project owner shall submit to the CPM a copy of the letter from Colusa County stating that all applicable criteria have been met to the satisfaction of the Colusa County Planning Director.

LAND USE-4	Calpine shall pave a new runway to allow for year round use by members of the local agricultural industry. The location of the new runway shall be to the satisfaction of the Sutter County Board of Supervisors.	At least 30 days prior to the start of construction of the runway, the project owner shall submit to the CPM a copy of a letter from the Sutter County Board of Supervisors stating that the location of the new runway, timing of onstruction, and method of paving have been agreed upon to the satisfaction of the Sutter County Board of Supervisors.
LAND USE-5	Where indicated by safety concerns, the transmission line shall have a minimum clearance of 42 feet from the ground to the conductor at maximum sag and the transmission line shall be designed to satisfy the safety concerns of Sutter Extension Water District and Sutter County (on behalf of aerial applicator safety, and public safety), including any applicable provisions of Article 86, State of California High Voltage electrical Safety Order, section 2946.	At least 30 days prior to the start of construction the project owner shall submit to the Compliance Project Manager a copy of a letter from the Sutter County Board of Supervisors stating that the Board of Supervisors has conferred with Calpine and the Sutter Extension Water District to agree on any measures necessary to ensure compliance of the transmission line with the applicable provision of Article 86, State of California High Voltage Electrical Safety Orders, Section 2946.
LAND USE-6	Calpine, or any successive landowner, shall grant to Sutter County the development rights and an open area easement on the portion of the subject property that is not identified for development on the proposed development plan reviewed by the Board of Supervisors. The grant shall preclude Calpine and future owners of the land from expanding the facility beyond the 16 +/- acre area of the footprint and its related facilities (e.g. drainage facilities, evaporation ponds) approved as part of this request, unless the agreement is rescinded by a resolution adopted by the Board of Supervisors. The grant and easement shall run with the land and be recorded to give future property owners notice of its existence.	Prior to any site preparation work and prior to the issuance of a building permit for any construction on the project site, the project owner shall execute a conveyance of development rights and perpetual open area easement to the county of Sutter. A copy of the recorded agreement shall be provided to the CPM at least 30 days prior to the initiation of any earth moving activities.
LAND USE-7	The project owner shall place underground the existing 12 kV PG&E line which runs parallel to O'Banion Road from the South Township Road to the east levee of the Sutter Bypass. Encroachment permits shall be obtained from the Sutter County Public Works Department for any construction work done in the County right-of-way.	Prior to placing underground the 12 kV PG&E line, the project owner shall provide to the CPM a copy of the Encroachment permit issued by the County Public Works Department. Prior to construction of the 230 kV line from the plant site to the switching station, the project owner shall submit to the CPM verification in the form of a letter that the 12 kV PG&E line has been placed underground.
	SOCIOECONOMICS	
SOCIO-1	The project owner and its contractors and subcontractors shall recruit employees and procure materials and supplies within Sutter County first unless: ▪ to do so will violate federal and/or state statutes; ▪ the materials and/or supplies are not available; or ▪ qualified employees for specific jobs or positions are not available; or ▪ there is a reasonable basis to hire someone for a specific position from outside the local area.	At least 30 days prior to the start of construction, the project owner shall submit to the California Energy Commission (CEC) Compliance Project Manager (CPM) copies of contractor, subcontractor, and vendor solicitations and guidelines stating hiring and procurement requirements and procedures. In addition, the project owner shall notify the CEC CPM in each Monthly Compliance Report of the reasons for any planned procurement of materials or hiring outside the local regional area that will occur during the next two months. The CEC CPM shall review and comment on the submittal as needed.
SOCIO-2	The project owner shall provide a letter to the CEC CPM outlining the agreement between the project owner and Sutter County on the amount of fees and timing of payments the project owner will provide to cover project-specific impacts associated with hazardous materials handling and fire protection.	At least 30 days prior to the start of construction, the project owner shall submit to the CPM a copy of the agreement with the Sutter County Fire Department which states the amount of fees and timing of payment the project owner will provide to cover project-specific impacts associated with hazardous materials handling and fire protection.

VISUAL RESOURCES		
VIS-1	Prior to first electricity generation, the project owner shall treat the project structures, buildings, and tanks visible to the public in non-reflective colors to blend with the agricultural setting. ***Protocol:*** The project owner shall submit a treatment plan for the project to the California Energy Commission Compliance Project Manager (CPM) for review and approval. The treatment plan shall include: ▪ specification, and 11" x 17" color simulations, of the treatment proposed for use on project structures, including structures treated during manufacture; ▪ a detailed schedule for completion of the treatment; and, ▪ a procedure to ensure proper treatment maintenance for the life of the project. If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall submit to the CPM a revised plan. After approval of the plan by the CPM, the project owner shall implement the plan according to the schedule and shall ensure that the treatment is properly maintained for the life of the project. For any structures that are treated during manufacture, the project owner shall not specify the treatment of such structures to the vendors until the project owner receives notification of approval of the treatment plan by the CPM. The project owner shall not perform the final treatment on any structures until the project owner receives notification of approval of the treatment plan from the CPM. The project owner shall notify the CPM within one week after all precolored structures have been erected and all structures to be treated in the field have been treated and the structures are ready for inspection.	Not later than 60 days prior to ordering any structures that are to be color treated during manufacture, the project owner shall submit its proposed plan to the CPM for review and approval. If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall submit to the CPM a revised plan. Not less than thirty days prior to first electricity generation, the project owner shall notify the CPM that all structures treated during manufacture and all structures treated in the field are ready for inspection. The project owner shall provide a status report regarding treatment maintenance in the Annual Compliance Report..
VIS-2	Any fencing for the project shall be non-reflective. ***Protocol:*** At least 30 days prior to ordering the fencing the project owner shall submit to the CPM for review and approval the specifications for the fencing documenting that such fencing will be non-reflective. If the CPM notifies the project owner that revisions of the specifications are needed before the CPM will approve the submittal, the project owner shall submit to the CPM revised specifications. The project owner shall not order the fencing until the project owner receives approval of the fencing submittal from the CPM. The project owner shall notify the CPM within one week after the fencing has been installed and is ready for inspection.	At least 60 days prior to ordering the non-reflective fencing, the project owner shall submit the specifications to the CPM for review and approval. If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal. The project owner shall notify the CPM within seven days after completing installation of the fencing that the fencing is ready for inspection
VIS-3	Prior to first electricity generation, the project owner shall design and install all lighting such that light bulbs and reflectors are not visible from public viewing areas and illumination of the vicinity and the nighttime sky is minimized. To meet these requirements: ***Protocol:*** The project owner shall develop and submit a lighting plan for the project to the CPM and the Sutter County Community Services Department for review and approval. The lighting plan shall require that: ▪ Lighting is designed so that exterior light fixtures are hooded, with lights directed downward or toward the area to be illuminated and so that backscatter to the nighttime sky is minimized. The design of this outdoor lighting shall be such that the luminescence or light source is shielded to prevent light trespass outside the project boundary; ▪ High illumination areas not occupied on a continuous basis such as maintenance platforms or the main entrance are provided with switches or motion detectors to light the area only when occupied; ▪ A lighting complaint resolution form (similar in general format to that in Visual Attachment 1, which follows these Conditions) will be used by plant operations, to record all lighting complaints received and document the resolution of those complaints. All records of lighting complaints shall be kept in the on-site compliance file. If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall prepare and submit to the CPM a revised plan. Lighting shall not be installed before the plan is approved. The project owner shall notify the CPM when the lighting has been installed and is ready for inspection.	At least 60 days before ordering the exterior lighting, the project owner shall provide the lighting plan to the CPM and to the Sutter County Community Services Department for review and approval. If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, within 30 days of receiving that notification the project owner shall submit to the CPM a revised plan. The project owner shall notify the CPM within seven days of completing exterior lighting installation that the lighting is ready for inspection

VIS-4	By December 1 of the year in which ground disturbance related to construction of the power plant begins, the project owner shall implement a landscape plan that meets the requirements of the Sutter County Zoning Code and provides a continuous screen of the proposed power plant from sensitive view areas. The screen shall be created along the northern and southern boundaries of the Calpine property and along the eastern boundary of the Calpine property parallel to South Township Road. Protocol: The project owner shall submit to the CEC CPM for review and approval a specific plan describing its landscaping proposal, stating that it conforms to Sutter County's Zoning Code and has been approved by the County. The plan shall include, but not be limited to: ▪ a detailed landscape plan, at a reasonable scale, which includes a list of proposed tree and shrub species and sizes and a discussion of the suitability of the plants for the site conditions and mitigation objectives. One objective shall be to provide year-round screening. To meet this objective evergreen species shall be used. This may require a berm to raise the tree roots above the water table. Another objective shall be to provide screening at least 75 feet tall for the total distance to be screened, except where clearance beneath the proposed transmission line requires shorter trees. Another objective shall be to use species that grow rapidly. The plan shall propose species and spacing to achieve these objectives. Trees to be planted shall be the optimal size to reach full height as rapidly as possible. ▪ maintenance procedures, including any needed irrigation; and ▪ a procedure for replacing unsuccessful plantings If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall prepare and submit to the CPM a revised plan. The trees and shrubs shall not be planted before the plan is approved. The project owner shall notify the CPM when the trees and shrubs have been planted and are ready for inspection.	At least 90 days prior to the start of commercial operation of the project, the project owner shall submit the proposed landscape plan for the project to the CPM for review and approval. The CPM will respond to the project owner within 15 days of receipt of the landscaping plan. The project owner shall submit any required revisions within 30 days of notification by the CPM. The CPM will respond to the project owner within 15 days of receipt of the revised documents. The project owner shall notify the CPM within seven days after completing the proposed planting that the planting is ready for inspection.
VIS-5	Prior to first electricity generation at the Sutter Power Project, to reduce the contribution of the Sutter Power Project to cumulative visual impacts, the project owner shall have the Greenleaf 1 facilities painted to match the colors of the Sutter Power Project. ***Protocol:*** The project owner shall submit a treatment plan for the project to the California Energy Commission Compliance Project Manager (CPM) for review and approval. The treatment plan shall include: ▪ specification, and 11" x 17" color simulations, of the treatment proposed for use on project structures. ▪ a detailed schedule for completion of the treatment; and, ▪ a procedure to ensure proper treatment maintenance for the life of the project. f the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall submit to the CPM a revised plan. After approval of the plan by the CPM, the project owner shall implement the plan according to the schedule and shall ensure that the treatment is properly maintained for the life of the project. The project owner shall not perform the final treatment on any structures until the project owner receives notification of approval of the treatment plan from the CPM. The project owner shall notify the CPM within one week after all structures have been treated and the structures are ready for inspection.	At least 60 days prior to first commercial electricity generation at the Sutter Power Project, the project owner shall submit its proposed plan to the CPM for review and approval. If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, within 30 days of receiving that notification, the project owner shall submit to the CPM a revised plan. The project owner shall notify the CPM when all structures have been treated and are ready for inspection. The project owner shall provide a status report regarding treatment maintenance in the Annual Compliance Report.

VIS-6	Prior to first electricity generation, to offset the contribution of the Sutter Power Project to cumulative lighting impacts, the project owner shall have the lighting at the Greenleaf 1 Power Plant modified such that light bulbs and reflectors are not visible from public viewing areas and illumination of the vicinity and the nighttime sky is minimized. To meet these requirements: ***Protocol:*** The project owner shall develop and submit a lighting modification plan for the project to the CPM for review and approval. The lighting plan shall require that: • Exterior light fixtures are hooded, with lights directed downward or toward the area to be illuminated and backscatter to the nighttime sky is minimized. The luminescence or light source shall be shielded to prevent light trespass outside the project boundary; • High illumination areas not occupied on a continuous basis such as maintenance platforms or the main entrance shall be provided with switches or motion detectors to light the area only when occupied; • A lighting complaint resolution form (following the general format of that in attachment 1) will be used by plant operations, to record all lighting complaints received and document the resolution of those complaints. All records of lighting complaints shall be kept in the on-site compliance file. If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall prepare and submit to the CPM a revised plan. Lighting modifications shall not be made before the plan is approved. The project owner shall notify the CPM when the lighting modifications have been made and are ready for inspection.	At least 60 days prior to first electricity generation on the Sutter Power Project the project owner shall provide the lighting modification plan to the CPM for review and approval. If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, within 30 days of receiving that notification the project owner shall submit to the CPM a revised plan. The project owner shall notify the CPM within seven days after completing exterior lighting modifications that the lighting is ready for inspection.
VIS-7	To minimize potential visual impacts, the project owner shall place all electrical transmission poles so as to not be directly in front of any residence and, to the extent possible, so as to not be directly in the view of the Sutter Buttes from any residence. ***Protocol:*** At least 60 days prior to construction of the transmission line, the project owner shall submit a plan to the CPM showing: • all proposed pole locations; • all residences within one-quarter mile of the proposed transmission line route that have a view of the transmission line; and • the line of sight from each of the residences toward the Sutter Buttes. If the CPM notifies the project owner that re submit to the CPM a revised plan. Transmission line pole placement shall not begin before the plan is approved. The project owner shall notify the CPM when the poles have been installed and are ready for inspection.	At least 60 days prior to beginning transmission line construction, the project owner shall provide the electrical transmission pole plan to the CPM for review and approval. If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, within 30 days of receiving that notification the project owner shall submit to the CPM a revised plan. The project owner shall notify the CPM within seven days after completing transmission line construction that the line is ready for inspection.
BIOLOGICAL RESOURCES		
BIO-1	Construction-site and/or ancillary facilities preparation (described as any ground disturbing activity other than allowed geotechnical work) shall not begin until an Energy Commission Compliance Project Manager (CPM) approved designated biologist is available on site. ***Protocol:*** The designated biologist must meet the following minimum qualifications: 1) a bachelor's degree in biological sciences, zoology, botany, ecology, or a closely related field; 2) three years of experience in field biology or current certification of a nationally recognized biological society, such as the Ecological Society of America or The Wildlife Society; 3) one year of field experience with resources found in or near the project area; and 4) ability to demonstrate to the satisfaction of the CPM the appropriate education and experience for the biological resource tasks that must be addressed during project construction and operation. If, within 30 days of receiving the proposed designation, the CPM determines that the proposed designated biologist is unacceptable, the project owner shall submit another individual's name and qualifications for consideration. If the approved designated biologist needs to be replaced, the project owner shall obtain approval of a new designated biologist by submitting to the CPM the name, qualifications, address, and telephone number of the proposed replacement. No disturbance will be allowed in any designated sensitive area(s) until the CPM approves a new designated biologist and that designated biologist is on-site.	At least 30 days prior to the start of rough grading, the project owner shall submit to the CPM for approval, the name, qualifications, address, and telephone number of the individual selected by the project owner as the designated biologist. If a designated biologist is replaced the information on the proposed replacement as specified in the Condition must be submitted in writing at least ten working days prior to the termination or release of the preceding designated biologist.

BIO-2	The CPM approved designated biologist shall perform the following duties: 1) advise the project owner's supervising construction or operations engineer on the implementation of the biological resource Conditions of Certification; 2) supervise or conduct mitigation, monitoring, and other biological resource compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as wetlands and special status species; and 3) notify the project owner and the CPM of any non-compliance with any Condition.	The designated biologist shall maintain written records of the tasks described above, and summaries of these records shall be submitted along with the Monthly Compliance Reports to the CPM.
BIO-3	The project owner's supervising construction and operating engineer shall act on the advice of the designated biologist to ensure conformance with the biological resource Conditions of Certification. ***Protocol:*** The project owner's supervising construction and operating engineer shall halt, if needed, all construction activities in areas specifically identified by the designated biologist as sensitive to assure that potential significant biological resource impacts are avoided. The designated biologist shall: 1) tell the project owner and the supervising construction and operating engineer when to resume construction; and 2) advise the CPM if any corrective actions are needed or have been instituted.	Within two working days of a designated biologist's notification of non-compliance with a Biological Resources Condition or a halt of construction, the project owner shall notify the CPM by telephone of the circumstances and actions being taken to resolve the problem or the non-compliance with a Condition. For any necessary corrective action taken by the project owner, a determination of success or failure will be made by the CPM within five working days after receipt of notice that corrective action is completed, or the project owner will be notified by the CPM that coordination with other agencies will require additional time before a determination can be made.
BIO-4	The project owner shall develop and implement a Worker Environmental Awareness Program in which each of its own employees, as well as employees of contractors and subcontractors who work on the project site or related facilities (including any access roads, storage areas, transmission lines, water and gas lines) during construction and operation, are informed about biological resource sensitivities associated with the project (see General Conditions of Compliance). ***Protocol:*** The Worker Environmental Awareness Program: 1) shall be developed by the designated biologist and consist of an on-site or classroom presentation in which supporting written material is made available to all participants; 2) must discuss the locations and types of sensitive biological resources on the project site and adjacent areas; 3) must present the reasons for protecting these resources; 4) must present the meaning of various temporary and permanent habitat protection measures; and 5) must identify who to contact if there are further comments and questions about the material discussed in the program. The specific program can be administered by a competent individual(s) acceptable to the designated biologist. Each participant in the on-site Worker Environmental Awareness Program shall sign a statement declaring that the individual understands and shall abide by the guidelines set forth in the program material. Each statement shall also be signed by the person administering the Worker Environmental Awareness Program. The signed statements for the construction phase shall be kept on file by the project owner and made available for examination by the CPM for a period of at least six (6) months after the start of commercial operation. Signed statements for active operational personnel shall be kept on file by the project owner for the duration of their employment and for six months after their termination.	At least 30 days prior to the start of rough grading, the project owner shall provide copies of the Worker Environmental Awareness Program and all supporting written materials prepared by the designated biologist and the name and qualifications of the person(s) administering the program to the CPM for approval. The project owner shall state in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date.
BIO-5	Prior to the start of any ground disturbance activities, the project owner shall enter into an Endangered Species Memorandum of Understanding (MOU) with the California Department of Fish and Game (CDFG) (per Section 2081 of the California Endangered Species Act) and implement the terms of the agreement.	At least 60 days prior to the start of rough grading, the project owner shall submit to the CPM a copy of the final CDFG Endangered Species MOU.
BIO-6	Prior to construction, the project owner shall provide final copies of the Biological Opinions per Section 7 of the federal endangered species act obtained from the U.S. Fish and Wildlife Service (USFWS) and incorporate the terms of the agreement into the Biological Resources Mitigation Implementation and Monitoring Plan.	At least 60 days prior to the start of rough grading, the project owner shall submit to the project CPM copies of the final USFWS Biological Opinion.

BIO-7	The project owner shall acquire either a Streambed Alteration Agreement or written verification that this permit is not necessary from the California Department of Fish and Game for project impacts to drainages, and implement the terms of the agreement.	At least 45 days prior to the start of rough grading, the project owner shall provide the CPM with a copy of the California Department of Fish and Game Streambed Alternation Agreement or written verification that this permit is not necessary for this project.
BIO-8	The project owner shall ensure the following measures are implemented to avoid or mitigate project impacts to giant garter snakes: 1) Avoid trenching or auguring activities within 200 feet of giant garter snake habitat from October 2 through April 30. 2) Have the designated biologist on site during construction activities that occur between October 1 and May 1. The designated biologist shall possess a permit as required under Section 10(a)1(A) of the federal Endangered Species Act to capture or relocate snakes. 3) Within 24 hours prior to commencement of construction activities, the site shall be inspected for snakes by the designated biologist. Observed snakes should be reported and cleared to an area that will not be affected by construction within the next 24 hours. If a snake is encountered during construction activities, the designated biologist should be contacted and take appropriate measures to ensure the snake will not be harmed. 4) Avoid obstructing the flow of water through the canals (dewatering). Any dewatered habitat must remain dry for at least 15 consecutive days after April 15 and 15 consecutive days prior to excavating or filling dewatered habitat. 5) Prevent runoff from construction activities from entering giant garter snake habitat. 6) Restrict vegetation clearing to the minimal area necessary to facilitate construction activities. Mark and avoid giant garter snake habitat in or adjacent to the project that will not be directly affected by construction activities. 7) Provide replacement habitat at a location acceptable to USFWS and CDFG to compensate for habitat lost (BIO-13). 8) Mow, rather than disk, to control vegetation on-site. Mower blades should be raised to at least 6 inches during the snake's active period of May 1 to October 1. 9) Conduct activities to clear vegetation in the irrigation canals as necessary to minimize disturbance to snake habitat and in accordance with methods approved by CDFG and USFWS. 10) Eliminate wastewater discharge as described in Condition SOILS&WATER 2.	At least 45 days prior to rough grading, the project owner shall provide to the project CPM for review and approval written documentation (BRMIMP, BIO-12) that the above measures will be or have been accomplished by the licensee and specifying the procedures used or that will be used to implement these measures.
BIO-9	The project owner shall ensure the following measures are implemented to mitigate or avoid project impacts to Swainson's hawks: 1) The designated biologist shall conduct preconstruction surveys during March through June during construction years to determine if an active nest site is within 0.5 mile of construction activities. 2) Design the project to avoid removal of nest trees and to avoid placement of the transmission line within 0.1 mile of nest trees. 3) The designated biologist shall monitor construction activities that occur within 0.5 mile of an active nest site between March 1 and August 15 or until fledglings are no longer dependent on the nest tree. The monitoring plan shall be acceptable to CDFG. 4) Provide replacement habitat at a location acceptable to CDFG to compensate for the loss of habitat (BIO-13). 5) Protect on-site Swainson's hawk foraging habitat not taken by the power plant foot print in perpetuity or provide replacement habitat at a location and ratio acceptable to CDFG and establish an endowment account adequate to provide funds for the perpetual maintenance and management of the replacement habitat.	At least 45 days prior to rough grading, the project owner shall provide to the project CPM for review and approval written documentation (BRMIMP, BIO-12) that the above measures will be accomplished by the applicant and specifying the procedures used or that will be used to implement these measures.

BIO-10	The project owner shall ensure the following measures are implemented to mitigate or avoid project impacts to migratory birds: 1) Powerlines shall be constructed following recommendations in Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996 (Avian Powerline Interaction Committee 1996). 2) Powerlines located in sensitive areas (e.g. over Gilsizer Slough and through potential foraging or flyway areas) shall be fitted with bird flight diverters placed on the ground wire at 16.4-foot (5-meter) intervals. Sensitive areas shall be identified in the Biological Resources Mitigation Implementation and Monitoring Plan (Condition BIO-12). 3) Between October through March, measures shall be taken in areas of high migratory bird use (such as Gilsizer Slough) to flush birds from the construction area prior to stringing wires. 4) Develop a monitoring plan to analyze whether the transmission line and HRSG stacks are causing significant impacts from avian collision and/or electrocutions. If it is determined that significant impacts are occurring, propose remedial mitigation measures to be implemented. A report presenting the monitoring data and a discussion of the mitigation effectiveness shall be provided annually for 10 years following the completion of construction. If it can be shown that impacts to birds from the project are not occurring, licensee has the option to request staff to decrease the frequency or cease monitoring. 5) Underbuild distribution lines whenever possible. Underbuilt lines should be spaced below conductors to provide a vertical clearance of at least 43 inches. 6) If an evaporation pond is used to store the evaporater brine, the evaporation must be screened or otherwise modified to eliminate the potential for birds and wildlife to enter the pond. 7) Eliminate wastewater discharge as described in Condition SOILS&WATER 2.	At least 45 days prior to rough grading, the project owner shall provide to the project CPM for review and approval written documentation (BRMIMP, BIO-12) that the above measures will be accomplished by the licensee and specifying the procedures used or that will be used to implement these measures. The avian collision/electrocution monitoring plan annual report shall be provided to the project CPM no later than December 31 for each year monitoring is required.
BIO-11	The project owner shall ensure the following measures are implemented to mitigate or avoid project impacts to wetlands: 1) Provide in-kind replacement habitat at a location acceptable to USFWS for wetlands impacted by the project (BIO-13). 2) Establish an endowment account adequate to provide funds for the perpetual maintenance and management of the replacement habitat. 3) Mark and avoid all wetlands on site that will not be directly taken by the power plant footprint and all wetlands along Hughes Road in the Sutter National Wildlife Refuge. 4) Protect on-site wetlands not taken by the power plant foot print in perpetuity or provide replacement habitat at a location and ratio acceptable to USFWS and establish an endowment account adequate to provide funds for the perpetual maintenance and management of the replacement habitat. 5) Use an air cooled condenser to eliminate wet cooling tower evaporation and incorporate drains designed to route contaminated runoff away from the remaining wetlands or develop and implement a monitoring program to ensure the wetlands remaining on-site are not degraded by project operations. The program shall include parameters acceptable to USFWS that monitor hydrologic quality and productivity, and identify and defend reference or control wetlands for comparative analysis. If it is determined that the on-site wetlands are being negatively impacted, propose remedial mitigation measures to be implemented. A report presenting the monitoring data and a discussion of the mitigation effectiveness shall be provided annually for the life of the project. If it can be shown that the wetlands are not being negatively impacted, licensee has the option to request Staff to decrease the frequency or cease monitoring. 6) Place a construction cloth over all remaining wetlands located within 500 feet of construction and related roads during construction activities. 7) Place the pipeline under or in the shoulder of Hughes Road.	At least 45 days prior to rough grading, the project owner shall provide to the project CPM for review and approval written documentation (BRMIMP, BIO-12) that the above measures will be accomplished by the licensee and specifying the procedural terms for implementing these measures. The wetland monitoring plan annual report shall be provided to the project CPM no later than July 1 for each year monitoring is completed.

BIO-12	The project owner shall submit to the CPM for review and approval a copy of the final Biological Resources Mitigation Implementation and Monitoring Plan. Protocol: The Biological Resources Mitigation Implementation and Monitoring Plan shall identify: ▪ all sensitive biological resources to be impacted, avoided, or mitigated by project construction and operation; ▪ all conditions agreed to in the USFWS Biological Opinion and CDFG Endangered Species Memorandum of Understanding; ▪ all mitigation, monitoring and compliance conditions included in the Commission's Final Decision; ▪ all conditions agreed to in the USACE Clean Water Act Permits; ▪ all conditions specified in the CDFG Streambed Alteration Permit, if required; ▪ required mitigation measures for each sensitive biological resource; ▪ required habitat compensation, including provisions for acquisition, enhancement and management, for any loss of sensitive biological resources; ▪ a detailed plan for protecting the existence and monitoring the integrity of the wetlands remaining on-site; ▪ a detailed description of measures that will be taken to avoid or mitigate temporary disturbances from construction activities; ▪ all locations, on a map of suitable scale, of laydown areas and areas requiring temporary protection and avoidance during construction; ▪ aerial photographs of all areas to be disturbed during project construction activities - one set prior to site disturbance and one set subsequent to completion of mitigation measures. Include planned timing of aerial photography and a description of why times were chosen; ▪ monitoring duration for each type of monitoring and a description of monitoring methodologies and frequency; ▪ performance standards to be used to help decide if/when proposed mitigation is or is not successful; ▪ all remedial measures to be implemented if performance standards are not met; and ▪ a process for proposing plan modifications to the CPM and appropriate agencies for review and approval.	At least 45 days prior to rough grading, the project owner shall provide the CPM with the final version of the Biological Resources Mitigation Implementation and Monitoring Plan for this project, and the CPM will determine the plan's acceptability within 15 days of receipt of the final plan. The project owner shall notify the CPM five working days before implementing any modifications to the Biological Resource Mitigation Implementation and Monitoring Plan. Within 30 days after completion of construction, the project owner shall provide to the CPM, for review and approval, a written report identifying which items of the Biological Resource Mitigation Implementation and Monitoring Plan have been completed, a summary of all modifications to mitigation measures made during the project's construction phase, and which condition items are still outstanding.
BIO-13	The project owner shall provide a non-refundable $617,125 (less any discount negotiated with Wildlands, Inc.) in the form of a check or money order to Wildlands Incorporated to acquire and manage lands as compensation for the loss of habitat from SPP construction and operation. ***Protocol:*** Final determination of compensatory acres required will be determined by CEC after the project owner has submitted a final design of the project or by assuming a worse case estimate. The total number of compensatory acres shall account for the total number of acres lost for each habitat type impacted (Swainson's hawk habitat, wetland habitat, and giant garter snake habitat). If any habitat disturbance occurs beyond that covered by the $ 617,125 non-refundable amount, the project owner shall provide additional funds at current 1998 values of $52,000 per wetland acre, $ 1,500 per Swainson's hawk habitat acre, and $19,500 per giant garter snake habitat acre at ratios established by the CPM in consultation with USFWS and CDFG. The additional funds will be provided to Wildlands, Incorporated. Additional disturbance shall be determined by black and white aerial photographs taken before and after construction at a scale of 1" = 200' as specified in BIO-12.	Within sixty (60) days after the Commission Decision is issued, the project owner shall provide the CPM a copy of the land purchase agreement between the project owner and Wildlands, Incorporated. At least ten (10) days prior to construction, the project owner shall provide the CPM a copy of the check or money order delivered to Wildlands Incorporated. Within ninety (90) days prior to the start of construction, the project owner shall provide the CPM with aerial photos taken before construction. Within one hundred eighty (180) days after construction, the project owner shall provide the CPM aerial photos taken after construction and an analysis of the amount of any habitat disturbance additional to that determined in the FSA and compensated for by lands purchased. The CPM will notify the project owner of any additional amount of funds required to compensate for additional habitat disturbances at the adjusted market value at the time of construction.

NOISE		
NOISE-1	At least 15 days prior to the start of rough grading, the project owner shall notify all residents within one mile of the site, by mail or other effective means, of the commencement of project construction. At the same time, the project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the construction and operation of the project. If the telephone is not staffed 24 hours per day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This telephone number shall be posted at the project site during construction in a manner visible to passersby. This telephone number shall be maintained until the project has been operational for at least one year.	The project owner shall transmit to the CPM in the first Monthly Construction Report following the start of rough grading a statement, signed by the project manager, attesting that the above notification has been performed, and describing the method of that notification. This statement shall also attest that the telephone number has been established and posted at the site.
NOISE-2	NOISE-2 Throughout the construction and operation of the project, the project owner shall document, investigate, evaluate, and attempt to resolve all project related noise complaints. ***Protocol***: The project owner or authorized agent shall: ▪ use the Noise Complaint Resolution Form (see next page for example), or functionally equivalent procedure acceptable to the CPM, to document and respond to each noise complaint; ▪ attempt to contact the person(s) making the noise complaint within 24 hours; ▪ conduct an investigation to determine the source of noise related to the complaint; ▪ if the noise is project related, take all feasible measures to reduce the noise at its source; and ▪ submit a report documenting the complaint and the actions taken. The report shall include: a complaint summary, including final results of noise reduction efforts; and if obtainable, a signed statement by the complainant stating that the noise problem is resolved to complainant's satisfaction.	Within 30 days of receiving a noise complaint, the project owner shall file a copy of the Noise Complaint Resolution Form, or similar instrument approved by the CPM, with the Sutter County Community Services Department and with the CPM documenting the resolution of the complaint. If mitigation is required to resolve a complaint, and the complaint is not resolved within a 30 day period, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is finally implemented.
NOISE-3	Prior to the start of project construction, the project owner shall submit to the CPM for review a noise control program. The noise control program shall be used to reduce employee exposure to high noise levels during construction and also to comply with applicable OSHA standards.	At least 30 days prior to the start of rough grading, the project owner shall submit to the CPM the above referenced program.
NOISE-4	The project owner shall conduct steam blows only during the hours of 7:00 a.m. to 8:00 p.m. weekdays, and 8:00 a.m. to 8:00 p.m. weekends and holidays. The project owner shall use a modern, low-pressure, continuous, "quiet" steam blow process and shall submit a description of this process, with expected noise levels and projected hours of execution, to the CPM.	At least 15 days prior to the first low-pressure continuous steam blow, the project owner shall submit to the CPM drawings or other information describing the process, including the noise levels expected and the expected time schedule for execution of the process.
NOISE-5	The project owner shall conduct a public notification program to alert residents within one mile of the site prior to the start of steam blow activities. The notification shall include a description of the purpose and nature of the steam blow(s), the proposed schedule, the expected sound levels and the explanation that it is a one-time operation and not a part of normal plant operations.	At least 15 days prior to the first steam blow(s), the project owner shall notify all residents within one mile of the site of the planned steam blow activity, and shall make the notification available to other area residents in an appropriate manner. The notification may be in the form of letters to the area residences, telephone calls, fliers or other effective means. Within five (5) days of notifying these entities, the project owner shall send a letter to the CPM confirming that they have been notified of the planned steam blow activities, including a description of the method(s) of that notification.

NOISE-6	Upon the project first achieving an output of 80 percent or greater of rated capacity, the project owner shall conduct a 25-hour community noise survey, utilizing the same monitoring sites employed in the pre-project ambient noise survey as a minimum. The survey shall also include the octave band pressure levels to ensure that no new pure-tone noise components have been introduced. If the results from the survey indicate that operation of the power plant causes noise levels in excess of 45 dBA (leq) measured at the nearest residence, additional mitigation measures shall be implemented to reduce noise to a level of compliance with this limit. No single piece of equipment shall be allowed to stand out as a dominant source of noise.	Within 30 days after first achieving an output of 80 percent or greater of rated output, the project owner shall conduct the above described noise survey. Within 30 days after completing the survey, the project owner shall submit a summary report of the survey to the Sutter County Community Services Department and the CPM. Included in the report will be a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limits, and a schedule, subject to CPM approval, for implementing these measures. Within 30 days of completion of installation of these measures, the project owner shall submit to the CPM a summary report of a new noise survey, performed as described above and showing compliance with this condition.
NOISE-7	The project owner shall conduct an occupational noise survey to identify the noise hazardous areas in the facility. The survey shall be conducted within thirty (30) days after the facility is in full operation, and shall be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations sections 5095-5100 (Article 105) and Title 29, Code of Federal Regulations, Part 1910. The survey results shall be used to determine the magnitude of employee noise exposure. The project owner shall prepare a report of the survey results and, if necessary, identify proposed mitigation measures that will be employed to comply with the applicable California and federal regulations.	Within 30 days after completing the survey, the project owner shall submit the noise survey report to the CPM. The project owner shall make the report available to OSHA upon request.
TRAFFIC AND TRANSPORTATION		
TRANS-1	The project owner shall comply with California Department of Transportation (Caltrans) and Sutter County limitation on vehicle sizes and weights. In addition, the project owner or its contractor shall obtain necessary transportation permits from Caltrans and all relevant jurisdictions for both rail and roadway use.	In monthly compliance reports, the project owner shall submit copies of any oversize and overweight transportation permits received during that reporting period. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation.
TRANS-2	The project owner or its contractor shall comply with California Department of Transportation (Caltrans) and Sutter County limitations for encroachment into public rights-of-way and shall obtain necessary encroachment permits from Caltrans and all relevant jurisdictions.	In monthly compliance reports, the project owner shall submit copies of any encroachment permits received during that reporting period. In addition, the project owners shall retain copies of these permits and supporting documentation in its compliance file for at least six months after the start of commercial operation.
TRANS-3	The project owner shall ensure that all federal and state regulations for the transport of hazardous materials are observed.	The project owner shall include in its monthly compliance reports copies of all permits and licenses acquired by the project owner and/or subcontractors concerning the transport of hazardous substances.
TRANS-4	The project owner shall require all truck deliveries using Highway 99 to use Oswald Road and South Township Road to the site and all truck deliveries using Highway 20 to use George Washington to Oswald Road and then South Township Road to the site.	The project owner shall include this specific route in its contracts for truck deliveries and maintain copies onsite for inspection by the CPM.
TRANS-5	All oversized equipment delivered by rail shall use the following route to the project site: Clark Road west to Broadway, south on Broadway to Nostra Road, west on Nostra Road to North Township, south on North Township to the SPP site. If the project owner finds another rail spur to be more advantageous, the project owner shall consult with Sutter County and request in writing approval for the use of that route from the CPM.	The project owner shall include this specific route in its contracts for oversized equipment delivery and maintain copies onsite for inspection by the CPM. If another route than that described in Condition of Certification TRANS-5 is found advantageous by the project owner, the project owner shall request approval in writing for the use of that route at least 30 days in advance of the use date.

TRANS-6	Prior to the start of construction, the project owner shall consult with Sutter County and will prepare a construction traffic control plan and implementation program which includes addressing the timing of heavy equipment and building materials deliveries; signing, lighting and traffic control device placement for natural gas pipeline and transmission line construction; and establishing construction work hours outside of peak traffic periods.	Thirty days prior to construction, the project owner shall provide to the CPM and to Sutter County Public Works Department for review and approval a copy of its construction traffic control plan and implementation program.
TRANS-7	Based on determination of primary roadways to be used in the traffic control plan and implementation program and following construction of the power plant and all related facilities, the licensee shall repair those primary roadways to original or as near original condition as possible.	Thirty days prior to construction, the licensee shall photograph the primary roadways. The licensee shall provide the CPM and Sutter County with a copy of these photographs. Within 30 days of the completion of project construction, the licensee will meet with the CPM and Sutter County Public Works Department to determine and receive approval for the actions necessary and schedule to complete the repair of those roadways to original or as near original condition as possible.
	SOIL AND WATER RESOURCES	
SOIL & WATER-1	The Sutter Power Project will utilize a 100 percent dry cooling technology. Wet or wet/dry cooling technology will not be used.	Once operation has begun, the Calpine shall provide to the CPM in the annual compliance report, a record of the average month groundwater consumption, the monthly average groundwater levels as measured in the project well(s), and the monthly average total dissolved solid (TDS) concentration in the project water supply.
SOIL & WATER-2	No project wastewater streams shall be discharged to surface water.	The volume and method of disposal for all wastewater streams shall be provided to the CEC CPM in the annual compliance report.
SOIL & WATER-3	Prior to the initiation of any earth moving activities, the project owner shall submit a final erosion control and revegetation plan for staff approval. The final plan shall contain all the elements of the draft plan contained in Calpine Data Response No. 33, dated March 4, 1998, with changes made to address the final design of the project.	The final erosion control and revegetation plan shall be submitted to the CPM for approval at least 30 days prior to the initiation of any earth moving activities.
SOIL & WATER-4	Prior to beginning any clearing, grading or excavation activities associated with construction of the power plant, transmission and gas lines, the project owner must submit a notice of intent to the State Water Resources Control Board to indicate that the project will operate under provisions of the General Construction Activity Storm Water Permit. As required by the general permit, the project owner will develop and implement a Storm Water Pollution Prevention Plan (SWPPP).	At least two weeks prior to the start of construction, the project owner will submit to the CPM a copy of the Storm Water Pollution Prevention Plan (SWPPP) for review and approval. This includes SWPPPs Developed for all linear facilities.
SOIL & WATER-5	The project owner shall submit to the California State Water Resources Control Board a notice of intent to comply with the provisions of the General Industrial Activities Storm Water Permit. The project owner shall develop and implement the required Storm Water Pollution Prevention Plan.	At least thirty 30 days prior to operation, the project owner shall submit to the CPM a copy of the Storm Water Pollution Prevention Plan that was prepared.
SOIL & WATER-6	The project owner shall provide on-site retention of stormwater during periods of high runoff to ensure that the project will not contribute to drainage problems. Periods of high runoff shall be considered 10-year, 24-hour storms or greater. The project owner shall prepare a report evaluating potential effects of stormwater runoff from the project site on downstream drainage facilities. Specifically, this report shall identify the volume of runoff anticipated from the proposed site for the twenty-five and 50-year, 24-hour storm, how this runoff will be accommodated on-site and the ability of the field drains, the North Drain and Pump Plant No. 2 to accommodate these flows, especially during 10-year, 24-hour or greater storms. The plan shall identify any improvements needed to be made to these facilities to ensure their ability to accommodate stormwater flows from the project. The plan shall also verify that the project's use of these drainage facilities and any necessary improvements to them has been coordinated with all public and private entities that own and/or are responsible for the operation and maintenance of all downstream drainage facilities affected by project runoff.	Thirty (30) days prior to the start of construction, the project owner shall submit for review and approval to the CEC CPM and the Sutter County Department of Public Works the proposed drainage plan.

SOIL & WATER-7	All sanitary wastewater shall be disposed into a sewage disposal system constructed and operated under permit from the Regional Water Quality Control Board or constructed to standards established by the Sutter County Environmental Health Division.	Prior to any earth moving activities or the issuance of a building permit, the project owner shall submit to the CPM a copy of the permit and waste discharge requirements or a copy of the permit from the County Environmental Health Division.
HAZARDOUS MATERIAL MANAGEMENT		
HAZ-1	The project owner shall not use any hazardous material in reportable quantities, as specified in Code of Federal Regulations, Part 40, Subpart F, Section 68.130, that is not listed in Tables 5.8-4 and 5.8-5 of the AFC (Ex. 4.), unless approved in advance by the California Energy Commission's Compliance Project Manager (CPM).	The project owner shall provide, in the Annual Compliance Report, a list of hazardous materials contained at the facility in reportable quantities.
HAZ-2	The project owner shall provide a Risk Management Plan and Process Safety Management Plan to the Sutter County Fire Department and the Energy Commission CPM for review and approval at the time the plans are first submitted to the U.S. Environmental Protection Agency (EPA) and the California Occupational Safety and Health Administration (Cal OSHA). The project owner shall reflect all recommendations of the Sutter County Fire Department and CPM in the final document. A copy of the final plans, reflecting all comments, shall be provided to the Sutter County Fire Department and the CPM once approved by EPA and Cal OSHA.	At least sixty (60) days prior to the delivery of anhydrous ammonia to the facility, the project owner shall provide the final approved plans listed above to the CPM.
HAZ-3	The project owner shall provide a letter from the Sutter County Fire Department indicating that adequate funding for fire protection resources has been identified and that such funding will be available to the Department as needed to ensure adequate emergency response capability.	At least 30 days prior to delivery of anhydrous ammonia to the facility, the project owner shall provide a copy of the letter described above from the Sutter County Fire Department.
WASTE MANAGEMENT		
WASTE-1	The project owner shall obtain a hazardous waste generator identification number and hazardous waste treatment permit for neutralization facilities from the Department of Toxic Substances Control prior to generating any hazardous waste.	The project owner shall keep copies of the identification number and permit on file at the project site and notify the CPM via the monthly compliance report of their receipt.
WASTE-2	The project owner shall notify the CPM of any waste management-related enforcement action taken or proposed to be taken against it, or against any waste hauler or disposal facility or treatment operator that the owner contracts with.	The project owner shall notify the CPM in writing within 10 days of becoming aware of an impending enforcement action.
WASTE-3	Prior to the start of both construction and of operation, the project owner shall prepare and submit to the Sutter County Community Services Department and the CPM a waste management plan for all wastes generated during construction and operation of the facility, respectively. The plans shall contain, at a minimum, the following: ▪ A description of all waste streams, including projections of frequency, amounts generated and hazard classifications; and ▪ Methods of managing each waste, including treatment methods and companies contracted with for treatment services, waste testing methods to assure correct classification, methods of transportation, ▪ disposal requirements and sites, and recycling and waste minimization/reduction plans.	No less than 30 days prior to the start of construction, the project owner shall submit the construction waste management plan to the Sutter County Community Services Department and the CPM for review. The operation waste management plan shall be submitted no less than 60 days prior to the start of project operation. The project owner shall submit any required revisions within 30 days of notification of the need for such revisions by the CPM (or mutually agreed upon date).

WORKER SAFETY AND FIRE PROTECTION		
SAFETY-1	The project owner shall submit to the CPM a copy of the Project Construction Safety and Health Program as follows: ▪ Construction Injury and Illness Prevention Program ▪ Construction Fire Protection and Prevention Plan ▪ Personal Protective Equipment Program ***Protocol:*** The Construction Injury and Illness Prevention Program and the Personal Protective Equipment Program shall be submitted to the California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA) Consultation Service, for review and comment concerning compliance of the program with all applicable Safety Orders. The Construction Fire Protection and Prevention Plan shall be submitted to the Sutter County Fire Department for review and acceptance.	At least 30 days prior to the start of construction, or a date agreed to by the CPM, the project owner shall submit to the CPM a copy of the Project Construction Safety and Health Program, incorporating Cal/OSHA's Consultation Service comments, and a letter from the Sutter County Fire Department stating that they have reviewed and accepted the Construction Fire Protection and Prevention Plan and the Personal Protective Equipment Program.
SAFETY-2	The project owner shall submit to the CPM a copy of the Project Operation Safety and Health Program containing the following: ▪ Operation Injury and Illness Prevention Plan ▪ Emergency Action Plan ▪ Operation Fire Protection Plan ▪ Personal Protective Equipment Program ***Protocol:*** The Operation Injury and Illness Prevention Plan, Emergency Action Plan, and Personal Protective Equipment Program shall be submitted to the California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA) Consultation Service, for review and comment concerning compliance of the program with all applicable Safety Orders. The Operation Fire Protection Plan and the Emergency Action Plan shall be submitted to the Sutter County Fire Department for review and acceptance.	At least 30 days prior to the start of operation, the project owner shall submit to the CPM a copy of the final version of the Project Operation Safety & Health Program. It shall incorporate Cal/OSHA Consultation Service comments and a letter from the Sutter County Fire Department stating that they have reviewed and accepted the specified elements of the proposed Operation Safety and Health Plan. The project owner shall notify the CPM that the Project Operation Safety and Health Program (Injury and Illness Prevention Plan, Fire Protection Plan, the Emergency Action Plan, and Personal Protective Equipment requirements), including all records and files on accidents and incidents, is present on-site and available for inspection.
SAFETY-3	The project owner shall design and install all exterior lighting to meet the requirements contained in the Visual Resources Conditions of Certification and in accordance with the American National Standards Practice for Industrial Lighting, ANSI/IES- RP-7.	Within 60 days after construction is completed, the project owner shall submit a statement to the CPM that the illuminance contained in ANSI/IES RP-7 were used as a basis for the design and installation of the exterior lighting.

CULTURAL RESOURCES		
CUL-1	Prior to the start of project construction (defined as any construction-related vegetation clearance, ground disturbance and preparation, and site excavation activities), the project owner shall provide the California Energy Commission Compliance Project Manager (CPM) and Western with the name(s) and qualifications of its designated cultural resource specialist and mitigation team members. The designated cultural resource specialist shall be responsible for implementing all the cultural resource Conditions of Certification, using qualified personnel to assist him or her in project-related field surveys, monitoring, data collection and artifact recovery, mapping, mitigation, analysis of recovered cultural resources and data, or report preparation. After CPM and Western approval of the Cultural Resource Monitoring and Mitigation Plan (described below in condition CUL-3), the designated cultural resource specialist and team shall be available to implement the mitigation plan prior to, and throughout construction of the project. ***Protocol:*** The project owner shall provide the CPM and Western with a resume or statement of qualifications for its designated cultural resources specialist and mitigation team members. The resume(s) shall include the following information: 1) The resume for the designated cultural resource specialist shall demonstrate that the specialist meets the following minimum qualifications: a graduate degree in archaeology, anthropology, California history, or cultural resource management; at least three years of cultural resource mitigation and field experience in California, including at least one year's experience leading cultural resource field surveys; leading site mapping and data recording; marshalling equipment necessary and leading archaeological resource recovery operations; preparing recovered materials for analysis and identification; recognizing the need for appropriate sampling and/or testing in the field and in the lab; directing the analyses of mapped and recovered materials and data; completing the identification and inventory of recovered cultural materials; and the preparation of appropriate reports to be filed with the receiving curation repository, the appropriate regional information center(s), the State Historic Preservation Officer, Western and the CPM. 2) The resume for the designated cultural resource specialist shall include a list of specific projects the specialist has previously worked on; the role and responsibilities of the specialist for each project listed; and the names and phone numbers of contacts familiar with the specialist's work on these referenced projects. 3) If additional personnel will be assisting the designated cultural resource specialist in project-related field surveys, monitoring, data and artifact recovery, mapping, mitigation, material analysis, or report preparation, the project owner shall also provide names, addresses, and resumes for these itigation team members. 4) If the CPM and Western determine that the qualifications of the proposed cultural resource specialist are not in concert with the above requirements, the project owner shall submit another individual's name and qualifications for consideration. 5) If the previously approved, designated cultural resource specialist is replaced prior to completion of project mitigation, the project owner shall obtain CPM and Western approval of the new designated cultural resource specialist by submitting to the CPM and Western the name and qualifications of the proposed replacement specialist, at least ten (10) days prior to the termination or release of the preceding designated cultural resource specialist.	At least ninety (90) days prior to the start of construction on the project, the project owner shall submit the name and resume for its designated cultural resource specialist to the CPM and Western for review and written approval. Thirty (30) days prior to start of construction, the project owner shall confirm in writing to the CPM, who will notify Western, that the previously approved designated cultural resource specialist and the team of assistants are prepared to implement the monitoring and mitigation measures for cultural resources, as described in the Cultural Resources Monitoring and Mitigation Plan, prepared per condition CUL-3, below. At least ten (10) days prior to the termination or release of a designated cultural resource specialist, the project owner shall obtain CPM and Western approval of the new designated cultural resource specialist by submitting to the CPM and Western the name and resume of the proposed replacement specialist.

CUL-2	Prior to the start of project construction, the project owner shall provide the designated cultural resource specialist and the CPM with maps and drawings for the Sutter Power Plant project. The final center lines and right-of-way boundaries shall be provided on 7.5 minute quad maps, and the location of all the various areas where surface disturbance may be associated with project-related access roads, storage yards, laydown sites, pull sites, pump or pressure stations, Sutter Bypass switching station, on-site switchyard, electrical tower or pole footings, etc. Where the potential for impacts to significant cultural resources has been identified, the designated cultural resource specialist may request, and the project owner shall provide, enlargements of portions of the 7.5 minute maps presented as a sequence of strip maps for the linear facility routes. The strip maps shall show mile-post markers and the detailed locations of proposed access roads, storage or laydown sites, tower or pole footings, and any other areas of disturbance associated with the construction and maintenance of linear facilities.	At least ninety (90) days prior to the start of construction on the project, the project owner shall provide the designated cultural resource specialist, the CPM, and Western with final maps at appropriate scale(s) and drawings for all project facilities. Copies of all requests for more detailed maps by the designated cultural resource specialist shall also be submitted in writing to the CPM. There is no need to include Western in this submittal.
CUL-3	Prior to the start of project construction, the designated cultural resource specialist shall prepare a draft Cultural Resources Monitoring and Mitigation Plan to identify general and specific measures to minimize potential impacts to significant cultural resources. The CPM will review, and must approve in writing, the draft Cultural Resources Monitoring and Mitigation Plan. The CPM will provide copies of the draft plan to Western so that Western may submit this plan to the SHPO for concurrence prior to the project owner taking any actions under the approved monitoring and mitigation plan. ***Protocol***: The Cultural Resources Monitoring and Mitigation Plan shall include, but not be limited to, the following elements and measures: a. A discussion of the sequence of project-related tasks, such as any final pre-project surveys, fieldwork, flagging or staking; construction monitoring; mapping and data recovery; preparation for recovery of cultural resources; preparation of recovered materials for analysis, identification, and inventory; preparation of preliminary and final reports; and preparation of materials for curation. b. An identification of the person(s) expected to assist with each of the tasks identified in a, above, and a discussion of the mitigation team leadership and organizational structure, and the inter-relationship of tasks and responsibilities. c. Where sensitive areas are to be monitored during construction or avoided during operation, the designated cultural resource specialist shall identify measures such as flagging or fencing to prohibit or otherwise restrict access to sensitive resource areas. The discussion should address how these measures will be implemented prior to the start of construction and how long they will be needed to protect the resources from project-related effects. d. Where the need for monitoring of project construction activities has been determined by Western, the designated cultural resource specialist, in consultation with the CPM, will establish a schedule for the monitor(s) to be present. If the designated cultural resource specialist determines that the likelihood of encountering cultural resource or sites in certain areas is slight, monitoring may be discontinued in that location. e. If cultural resources are encountered are exposed during project-related grading, excavation, augering, and/or trenching, the designated cultural resource specialist shall have the authority to halt or redirect construction in the immediate vicinity of the find until the specialist can determine the significance of the find. The designated cultural resource specialist shall act in accordance with the following procedures: ▪ The project owner, or designated representative, shall inform the CPM and Western within one working day of the discovery of any potentially significant cultural resources and discuss the specific measure(s) proposed to mitigate potential impacts to these resources. ▪ The designated cultural resource specialist, representatives of the project owner, Western, and the CPM shall confer within 5 working days of the notification of the CPM, if necessary, to discuss any mitigation measures already implemented or proposed to be implemented, and to discuss the disposition of any finds. ▪ The SHPO will be consulted on potential eligibility, effect, and proposed mitigative measures. As the federal lead agency, Western will initiate the consultations with the SHPO. ▪ All required data recovery and cultural resource impact mitigation shall be completed as expeditiously as possible. f. All isolates encountered will be recorded and mapped; all lithic scatters	At least sixty (60) days prior to the start of construction on the project, the project owner shall provide the CPM and Western with a copy of the draft Cultural Resources Monitoring and Mitigation Plan prepared by the designated cultural resource specialist. The CPM and Western will provide written approval or disapproval of the proposed Cultural Resources Monitoring and Mitigation Plan within 15 days of receipt of the submittal. If the draft plan is not approved, the project owner, the designated cultural resource specialist, the CPM, and Western shall meet to discuss comments and work out necessary changes.

	and/or cultural resource sites will be recorded and mapped and all diagnostic artifacts will be collected for analysis; and all recovered cultural resource materials will be prepared and delivered for curation into a retrievable storage collection in a public repository or museum which meets the Title 36 Code of Federal Regulations 79 standards for the curation of cultural resource materials. g. The identification of the public institution that has agreed to receive any maps and data, records, reports, and any cultural resource materials recovered during project-related monitoring and mitigation work. Also include a discussion of any requirements or specifications for materials delivered for curation and how they will be met. The name and phone number of the contact person at the institution shall be included as well.	
CUL-4	Prior to the start of project construction, the project owner shall conduct a pre-construction reconnaissance and staking in all areas expected to be affected by construction and operation of the proposed project and its associated linear facilities. The staking of the linear facilities shall use the final design, centerlines, rights-of-way, and mile posts delineated in the construction drawings and maps prepared under condition of certification CUL-2. The designated cultural resource specialist will use the mile post stakes and boundary markers to identify sensitive areas with the potential to produce cultural resources and for implementation of specific measures, as described in condition CUL-8, below.	A least thirty (30) days prior to the start of construction, the project owner will complete a pre-construction reconnaissance and staking of the post miles and right-of- way boundaries in all areas expected to be affected by construction and operation of the proposed project and its associated linear facilities.
CUL-5	Prior to the start of construction on the project, the designated cultural resource specialist shall prepare an employee training program. The designated cultural resource specialist shall submit the training program to the CPM and Western for review and written approval. ***Protocol***: The training program will address the potential to encounter cultural resources during project-related site preparation and construction activities, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources. The training program shall also include the set of reporting procedures that workers are to follow if any cultural resources are encountered during project activities. This training program may be combined with other training programs prepared for paleontological and biological resources, hazardous materials, or any other areas of interest or concern.	At least thirty (30) days prior to the start of construction on the project, the project owner shall submit to the CPM and Western for review, comment, and written approval, the proposed employee training program and set of reporting procedures the workers are to follow if cultural resources are encountered during project construction. Western may be required to submit this training plan to the SHPO for concurrence as part of the consultation process. The CPM and Western shall provide written approval or disapproval of the employee training program and set of procedures within 15 days after receipt of the submittal. If the draft training program is not approved, the project owner, the designated cultural resource specialist, the CPM, and Western shall confer as needed to achieve any necessary changes.
CUL-6	Prior to the start of construction, and throughout the project construction period as needed for all new employees, the project owner and the designated cultural resource specialist shall provide the approved training to all project managers, construction supervisors, and workers who operate ground-disturbing equipment. The project owner and construction manager shall provide the workers with the approved set of procedures for reporting any cultural resources that may be discovered during project-related ground disturbance.	Prior to the start of construction, and throughout the project construction period as needed for all new employees, the project owner and the esignated cultural resource specialist shall present the CPM- and Western-approved training program on the potential for project impacts to sensitive cultural resources. The training shall include a set of reporting procedures for cultural resources encountered during project activities. The project owner shall provide documentation in the Monthly Compliance Report to the CPM that the employee training and the set of procedures have been provided to all project managers, construction supervisors, and to all workers.

CUL-7	Throughout the project construction period, the project owner shall provide the designated cultural resource specialist with a current schedule of anticipated weekly project activity and a map indicating the area(s) where construction activities will occur. The designated cultural resource specialist shall consult daily with the project superintendent or construction field manager to confirm the area(s) to be worked on the next day(s). Throughout the monitoring and mitigation phase of the project, the designated cultural resource specialist shall maintain a daily log of monitoring and mitigation activities carried out by the specialist and members of the cultural resource mitigation team. The designated cultural resource specialist shall prepare summary reports on monitoring activities, any cultural resource finds and recovery efforts, and the progress or status of the resource monitoring, mitigation, preparation, identification, and analytical work being conducted for the project. Copies of these summaries shall be included in the Monthly Compliance Reports filed with CPM by the project owner. The CPM will forward copies of these summary reports to Western. The designated cultural resource specialist may informally discuss the cultural resource monitoring and mitigation activities with their Energy Commission technical counterpart at any time.	The project owner shall include, in the Monthly Compliance Reports to the CPM, a summary of the daily logs prepared by the designated cultural resource specialist; the CPM will forward copies to Western.
CUL-8	The designated cultural resource specialist shall be present at the construction site at all times when construction-related grading, excavation, trenching, and/or augering occurs in areas that lie within the natural river levee zone (found to be generally associated with the Shanghai-Nueva-Columbia soils group). Project areas where the natural levee zones may be found include the switchyard site, and portions of the 16-inch and the 4-inch natural gas pipeline routes. Using the mile posts and boundary stakes placed by the project owner, the designated cultural resource specialist shall monitor the route of the 16-inch natural gas pipeline, between Mile Post (MP) 8.97 to 9.51; MP 10.42 to MP 11.41; and MP 12.1 to 13.70. For the route of the 4-inch natural gas pipeline, areas to be monitored full-time are from MP 0.00 to MP 1.60. Other sections of the linear facility routes may be monitored as deemed necessary by the CPM and Western.	The project owner shall include, in the Monthly Compliance Reports to the CPM, a summary of the daily logs prepared by the designated cultural resource specialist; the CPM will forward copies to Western.
CUL-9	If buried human remains are encountered during project-related grading, excavation, augering, and/or trenching, the construction crew shall halt or redirect construction in the immediate vicinity of the find and immediately contact the county coroner and the designated cultural resource specialist. If the coroner determines that the find is of Native American origin, the coroner shall notify the Native American Heritage Commission (NAHC) to request a determination of "most likely descendant". The NAHC is required to notify the descendant(s) and request that they inspect the burial and make recommendations for treatment or disposal. If Native American remains are encountered on federally managed land (within the Sutter National Wildlife Reserve), the US Fish and Wildlife Service is required to follow the procedures of the Native American Graves Protection and Repatriation Act, to repatriate the remains.	The designated cultural resource specialist shall notify the County Coroner, the project owner, the CPM, and Western if any buried human remains are encountered during project construction activities.
CUL-10	The project owner, through the designated cultural resource specialist, shall ensure the recovery, preparation for analysis, analysis, identification and inventory, the preparation for curation, and the delivery for curation of all significant cultural resource materials encountered and collected during the monitoring, data recovery, mapping, and mitigation activities related to the project.	The project owner shall maintain in its compliance files, copies of signed contracts or agreements with the designated cultural resource specialist and other qualified research specialists. These specialists will ensure the necessary recovery, preparation for analysis, analysis, identification and inventory, and preparation for curation of all significant cultural resource materials collected during monitoring, data recovery, mapping, and mitigation activities for the project. The project owner shall keep these files on-site and available for periodic audit by the CPM, for a period of at least two years after completion of the approved Final Cultural Resources Report.

CUL-11	The project owner shall ensure preparation of a Preliminary Cultural Resources Report following completion of data recovery and site mitigation work. The preliminary report is to be prepared by the designated cultural resource specialist and submitted to the CPM and Western for review and written approval. Western will provide copies of the preliminary report to the SHPO. ***Protocol***: The preliminary report shall include (but not be limited to) preliminary information on the survey report(s), methodology, and recommendations; site records and maps; determinations of significance; data recovery and other mitigation activities; discussion of possible results and findings of any analysis to be conducted on recovered cultural resource materials and data; proposed research questions that may be answered, or that may have been raised by the data from the project; related information such as maps, diagrams, charts, photographs and other appropriate materials; and an estimate of the time needed to complete the analysis of recovered cultural resource materials and prepare a final report. As the Federal lead agency, Western will provide a standard report format to be followed by the designated cultural resource specialist. If no cultural resource materials are recovered during project-related construction activities, the approved preliminary report shall also serve as the final report and shall be filed with appropriate entities, as described in conditions CUL-13 and CUL-14.	Within ninety (90) days following completion of the data recovery and site mitigation work, the project owner shall submit a copy of the Preliminary Cultural Resources Report to the CPM and Western for review, comment, and written approval.
CUL-12	The project owner will ensure preparation of a Final Cultural Resources Report by the designated cultural resource specialist, if cultural resource materials are found and recovered during project-related monitoring and mitigation. This final report shall be submitted to the CPM and Western for review and written approval. ***Protocol***: The final report shall include (but not be limited to) the survey report(s), methodology, and recommendations; site records and maps; description and inventory list of recovered cultural resource materials; determinations of sensitivity and significance; summary of data recovery and other mitigation activities; results and findings of any special analyses conducted on recovered cultural resource materials and data; research questions answered or raised by the data from the project; and the name and location of the public institution receiving the recovered cultural resource materials for curation. As the lead federal agency, Western will provide a standard report format to be followed by the designated cultural resource specialist.	The project owner shall submit a copy of the draft Final Cultural Resources Report to the CPM and Western for review, comment, and written approval. The report shall be submitted to the CPM and Western within ninety (90) days following completion of the analysis of the recovered cultural materials and preparation of related information. The project owner shall submit a copy of the final cultural resources report to the CPM and Western for review and written approval.
CUL-13	The project owner shall ensure that Western is provided with an original (or an original-quality) copy of the approved Final Cultural Resources Report, and other copies necessary to submit to the public institution receiving the recovered data and materials for curation, to the SHPO, and to the appropriate regional archaeological information center(s). A legible copy of the approved Final Cultural Resource Report shall be filed with the CPM, with a request for confidentiality, if needed to protect any sensitive resources or sites. The report copy sent to the curating institution and to the appropriate regional information centers shall include the information required by 36 Code of Federal Regulations 79 and the regional archaeological information centers.	The project owner shall maintain in its compliance files, copies of all documentation related to the filing of the original materials and the approved final cultural resources report with the public institution receiving the recovered data and materials for curation, with the appropriate regional archaeologic information repository(ies), and the SHPO. If no cultural resource materials were recorded or recovered, then the approved Preliminary Cultural Resources Report shall serve as the final report and is to be filed with these same agencies.
CUL-14	Within thirty (30) days following filing of the Final Cultural Resources Report with the CPM, Western, and the appropriate entities, the project owner, through the designated cultural resource specialist, shall deliver for curation all cultural resource materials collected during data recovery and mitigation for the project. The materials shall be delivered for curation into a public repository which meets the U.S. Secretary of Interior requirements for the curation of cultural resource materials.	The project owner shall maintain in its project history or compliance files, copies of signed contracts or agreements with the museum(s), niversity(ies), or other appropriate public repository(ies) by which the project owner has provided for delivery for curation of all the cultural resource materials collected during data recovery and site mitigation for the project.

PALCONTOLOGIC RESOURCES		
PAL-1	Prior to the start of project construction (defined as any construction-related vegetation clearance, ground disturbance and preparation, and site excavation activities), the project owner shall provide the California Energy Commission Compliance Project Manager (CPM) with the name(s) and qualifications of its designated paleontologic resources specialist and mitigation team members. The designated paleontologic resources specialist shall be responsible for implementing all the Conditions of Certification and for using qualified personnel to assist him or her in project-related field surveys; monitoring; fossil stabilization, removal, and transport; data collection and mapping; direction and implementation of mitigation procedures; matrix sampling, screen washing, and other micro-fossil recovery techniques; preparation and analysis of recovered fossils and data; identification and inventory of recovered fossils; preparation of recovered fossils for delivery and curation; and report preparation. After CPM approval of the Paleontologic Resources Monitoring and Mitigation Plan, described below in Condition PAL-4, the designated paleontologic resources specialist and team shall be available to implement the mitigation plan prior to, and throughout construction of the project. ***Protocol:*** The project owner shall provide the CPM with a resume or statement of qualifications for its designated paleontologic resources specialist and mitigation team members. The resume(s) shall include the following information: 1) The resume for the designated paleontologic resource specialist shall demonstrate that the specialist meets the following minimum qualifications: a graduate degree in paleontology or geology, or paleontologic resource management; at least three years of paleontologic resource mitigation and field experience in California, including at least one year's experience leading paleontologic resource field surveys; leading site mapping and data recording; marshalling and use of equipment necessary for fossil recovery, sampling, and screen washing; leading fossil recovery operations; preparing recovered materials for analysis and identification; recognizing the need for appropriate sampling and/or testing in the field and in the lab; directing the analyses of mapped and recovered fossil materials; completing the identification and inventory of recovered fossil materials; and the preparation of appropriate reports to be filed with the receiving curation repository, the University Museum of Paleontology at Berkeley, all appropriate regional information center(s), and the Commission. 2) The resume for the designated paleontologic resource specialist shall include a list of specific projects the specialist has previously worked on; the role and responsibilities of the specialist for each project listed; and the names and phone numbers of contacts familiar with the specialist's work on these referenced projects. 3) If additional personnel will be assisting the designated paleontologic resources specialist in project-related field surveys, monitoring, data and fossil recovery, mapping, mitigation, fossil analysis, or report preparation, the project owner shall also provide names, addresses, and resumes for these paleontology resource team members. 4) If the CPM determines that the qualifications of the proposed paleontologic resources specialist are not in concert with the above requirements, the project owner shall submit another individual's name and qualifications for consideration. 5) If the previously approved, designated paleontologic resources specialist is replaced prior to completion of project mitigation, the project owner shall obtain CPM approval of the new designated paleontologic resources specialist by submitting the name and qualifications of the proposed replacement to the CAM, at least ten (10) days prior to the termination or release of the preceding designated paleontologic resources specialist.	At least ninety (90) days prior to the start of construction on the project, the project owner shall submit the name and resume for its designated paleontologic resources specialist, to the CPM for review and approval. The CPM shall provide written approval or disapproval of the proposed paleontologic resources specialist. Thirty (30) days prior to start of construction, the project owner shall confirm in writing to the CPM that the previously approved, designated paleontologic resources specialist and the team of assistants are prepared to implement the monitoring and mitigation measures for paleontologic resources, as described in the CPM-approved Paleontologic Resources Monitoring and Mitigation Plan, prepared per Condition PAL-4, below. At least ten (10) days prior to the termination or release of a designated paleontologic resource specialist, the project owner shall obtain CPM approval of the new designated paleontologic resource specialist by submitting to the CPM the name and resume of the proposed replacement specialist.

PAL-2	Prior to the start of project construction, the project owner shall provide the designated paleontologic resource specialist and the CPM with maps and drawings for the Sutter Power Plant Project. The final center lines and right-of-way boundaries shall be provided on 7.5 minute quad maps, and the location of all the various areas where surface disturbance may be associated with project-related access roads, storage yards, laydown sites, pull sites, pump or pressure stations, switchyards, electrical tower or pole footings, etc. Where the potential for impacts to significant paleontologic resources has been identified, the designated paleontologic resources specialist may request, and the project owner shall provide, enlargements of portions of the 7.5 minute maps presented as a sequence of strip maps for the linear facility routes. The strip maps would show post mile markers and the detailed locations of proposed access roads, storage or laydown sites, tower or pole footings, and any other areas of disturbance associated with the construction and maintenance of linear facilities.	At least ninety (90) days prior to the start of construction on the project, the project owner shall provide the designated paleontologic resource specialist and the CPM with final maps at appropriate scale(s) and drawings for all project facilities. Any request for more detailed maps by the designated paleontologic resource specialist shall also be submitted in writing to the CPM.
PAL-3	Prior to the start of project construction, the designated paleontologic resource specialist shall prepare a draft Paleontologic Resources Monitoring and Mitigation Plan to identify general and specific measures to minimize potential impacts to sensitive paleontologic resources. The CPM will review and must approve in writing the draft Paleontologic Resources Monitoring and Mitigation Plan. After CPM approval, the project owner's designated paleontologic resource specialist and designated paleontologic resource team shall be available to implement the Monitoring and Mitigation Plan, as needed throughout project construction. ***Protocol:*** The Paleontologic Resources Monitoring and Mitigation Plan shall include, but not be limited to, the following elements and measures: a. A discussion of the sequence of project-related tasks, such as any final pre-project surveys, fieldwork, flagging or staking; construction monitoring; mapping and data recovery; fossil preparation and recovery; preparation for analysis, identification, and inventory; preparation of preliminary and final reports; and preparation of materials for curation. b. An identification of the person(s) expected to assist with each of the tasks identified in a, above, and a discussion of the mitigation team leadership and organizational structure, and the inter-relationship of tasks and responsibilities. c. Where sensitive areas are to be avoided during construction and/or operation, the designated paleontologic resource specialist shall identify measures such as flagging or fencing to prohibit or otherwise restrict access to sensitive resource areas. The discussion should address how these measures will be implemented prior to the start of construction and how long they will be needed to protect the resources from project-related effects. d. Where monitoring of project construction activities is deemed necessary by the designated paleontologic resource specialist, the specialist will determine the size or extent of the areas where monitoring is to occur and will establish a schedule for the monitor(s) to be present. If the designated specialist determines that the likelihood of encountering fossil resources in certain areas is slight, monitoring may be discontinued in that location. e. If fossil-bearing sediments or fossil materials are encountered on the surface or are exposed during project-related grading, augering, and/or trenching, the designated paleontologic resource specialist shall have the authority to halt or redirect construction in the immediate vicinity of the find until he or she can determine the significance of the find. The designated paleontologic resources specialist shall act in accordance with the following procedures: ▪ The project owner, or its designated representative, shall inform the CPM within one working day of the discovery of any potentially significant paleontologic resources and discuss the specific measure(s) proposed to mitigate potential impacts to these resources. ▪ The designated paleontologic resource specialist, representatives of the project owner, and the CPM shall confer within five working days of the notification of the CPM, if necessary, to discuss any mitigation measures already implemented or proposed to be implemented and to discuss the disposition of any finds. ▪ All necessary and required data recovery and mitigation shall be completed as expeditiously as possible. f. Include a discussion of the designated paleontologic resource specialist's access to equipment and supplies necessary for recovery of fossil	At least forty-five (45) days prior to the start of construction on the project, the project owner shall provide the CPM with a copy of the draft Monitoring and Mitigation Plan prepared by the designated paleontologic resource specialist. The CPM shall provide written approval or disapproval of the proposed Paleontologic Resources Monitoring and Mitigation Plan within 15 days of receipt of the submittal. If the draft plan is not approved, the project owner, the designated paleontologic resources specialist, and the CPM shall meet to discuss comments and achieve necessary changes.

	materials and matrix samples. This should include information on the types and availability of specialized equipment and supplies needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits. g. All paleontologic resource localities, rock units, and sediment and stratigraphic boundaries encountered shall be recorded (may include photos) and mapped; all vertebrate fossils and trackways, and all diagnostic invertebrate and plant fossils shall be stabilized, prepared and recovered for identification and analysis; adequate samples of potentially fossil-bearing matrix shall be collected and screen washed for sorting and analysis of micro-fossils; recovered fossil materials shall be analyzed and identified to the genus level whenever possible; and all recovered fossil materials shall be inventoried, prepared, and delivered for curation into a retrievable storage collection in a public repository or museum which meets the Society of Vertebrate Paleontologists (SVP) standards and requirements for the curation of paleontologic resources; h. Identify the institution that has agreed to receive any data and fossil materials recovered during project-related monitoring and mitigation work. Discuss any requirements or specifications for materials delivered for curation and how they will be met. Also include the name and phone number of the contact person at the institution.	
PAL-4	Prior to the start of project construction, the project owner shall conduct a pre-construction reconnaissance and staking in all areas expected to be affected by construction and operation of the proposed project and its associated linear facilities. The staking of the linear facilities shall use the final design, centerlines, rights-of-way, and post miles delineated in the construction drawings and maps prepared under Condition of Certification PAL-2. The designated paleontologic resources specialist will use the post mile stakes and boundary markers to identify sensitive areas with the potential to produce paleontologic resources and for implementation of specific measures, as described in Condition PAL-8, below.	A least thirty (30) days prior to the start of construction, the project owner shall complete a pre-construction reconnaissance and staking of mile-posts and right-of-way boundaries in all areas expected to be affected by construction and operation of the proposed project and its associated linear facilities.
PAL-5	Prior to the start of construction on the project, the designated paleontologic resources specialist shall prepare an employee training program. The designated paleontologic resource specialist shall submit the training program to the CPM for approval. ***Protocol:*** The training program will discuss the potential to encounter fossil resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources. The training shall also include the set of reporting procedures that workers are to follow if sensitive paleontologic resources are encountered during project activities. The training program will be presented by the designated paleontologic resources specialist and may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or any other areas of interest or concern.	At least thirty (30) days prior to the start of construction on the project, the project owner shall submit to the CPM for review, comment, and written approval, the proposed employee training program and set of reporting procedures the workers are to follow if paleontologic resources are encountered during project construction. The CPM shall provide the project owner with written approval or disapproval of the employee training program and the set of procedures within 15 days of receipt of the submittal. If the draft training program is not approved, the project owner, the designated paleontologic resources specialist, and the CPM shall meet to discuss the comments and work out necessary changes.
PAL-6	PAL-6 Prior to the start of construction, and throughout the project construction periodas needed for all new employees, the project owner and the designated paleontologic resource specialist shall provide the CPM-approved training to all project managers, construction supervisors, and workers who operate ground disturbing equipment. The project owner and construction manager shall provide the workers with the CPM-approved set of procedures for reporting any sensitive paleontologic resources or fossil-bearing sediments that may be discovered during project-related ground disturbance.	Prior to the start of construction, and throughout the project construction period as needed for all new employees, the project owner and the designated paleontologic resources specialist shall present the CPM-approved training program on the potential for project impacts to sensitive paleontologic resources. The training shall include a set of reporting procedures for paleontologic resources encountered during project activities. The project owner shall provide documentation in the Monthly Compliance Report to the CPM that the employee training and the set of procedures have been provided to all project managers, construction supervisors, and to all workers.

PAL-7	Throughout the project construction period, the project owner shall provide the designated paleontologic resource specialist with a current schedule of anticipated weekly project activity and a map indicting the area(s) where construction activities will occur. The designated paleontologic resource specialist shall consult daily with the project superintendent or construction field manager to confirm the area(s) to be worked on the next day(s). Throughout the paleontologic resources pre-construction reconnaissance, monitoring and mitigation phases of the project, the designated paleontologic resources specialist shall keep a daily log of any fossil resource finds and the progress or status of the surveys, resource monitoring, mitigation, preparation, identification, and analytical work being conducted for the project. The designated paleontologic resource specialist may informally discuss the paleontologic resource monitoring and mitigation activities with the Commission technical counterpart.	The project owner shall include, in the Monthly Compliance Reports to the CPM, a summary of the daily logs prepared by the designated paleontologic resource specialist.
PAL-8	PAL-8 The designated paleontologic resource specialist shall be present at all times to monitor construction-related grading, excavation, trenching, and/or augering in areas where remnant river terrace deposits have been found. These terrace remnants have been generally correlate with soils of the Conejo-Tisdale group and Pleistocene-age fossil materials may be present. Project areas where the terrace deposits may be found include the power plant site, the Sutter Bypass switching station, portions of the 16-inch natural gas pipeline route, and the electric transmission line route. Using the mile posts and boundary stakes placed by the project owner, the designated paleontologic resource specialist shall monitor the route of the 16-inch natural gas pipeline, between Mile Post (MP) 0.00 to MP 2.07; MP 3.58 to MP 3.70; and MP 4.10 to MP 4.50. For the route of the 4.0-mile electric transmission line, areas to be monitored full-time are MP 0.00 to MP 1.40; and MP 1.80 to MP 2.60. Other sections of the linear facility routes may be monitored as deemed necessary by the designated paleontologic resources specialist.	The project owner shall include in the Monthly Compliance Reports to the CPM, a summary of the daily logs prepared by the designated paleontologic resource specialist.
PAL-9	The project owner, through the designated paleontologic resources specialist, shall ensure the recovery, preparation for analysis, analysis, identification and inventory, the preparation for curation, and the delivery for curation of all significant paleontologic resource materials encountered and collected during pre-construction surveys and during the monitoring, data recovery, mapping, and mitigation activities related to the project.	The project owner shall maintain, in its compliance files, copies of signed contracts or agreements with the designated paleontologic resource specialist and other qualified research specialists. These specialists will ensure the necessary data and fossil recovery, mapping, preparation for analysis, analysis, identification and inventory, and preparation and delivery for curation of all significant paleontologic resource materials collected during data recovery and mitigation for the project. The project owner shall keep these files available for periodic audit by the CPM.
PAL-10	The project owner shall ensure preparation of a Preliminary Paleontologic Resources Report following completion of data recovery and site mitigation work. The preliminary report is to be prepared by the designated paleontologic resources specialist and submitted to the CPM for review, comment, and written approval. ***Protocol:*** The preliminary report shall include (but not be limited to) preliminary information on the survey report(s), methodology, and recommendations; site records and maps; determinations of sensitivity and significance; data recovery and other mitigation activities; possible results and findings of any analysis to be conducted on recovered paleontologic resource materials and data; proposed research questions that may be answered or may have been raised by the data from the project; and an estimate of the time needed to complete the analysis of recovered fossil materials and prepare a final report. If no fossil resources were recovered during project construction, the CPM-approved preliminary report shall also serve as the final report and shall be filed with appropriate entities, as described in conditions PAL-11 and PAL-12.	Within ninety (90) days following completion of the data recovery and site mitigation work, the project owner shall submit a copy of the Preliminary Paleontologic Resources Report to the CPM for review, comment, and written approval.

PAL-11	The project owner shall ensure preparation of a Final Paleontologic Resources Report by the designated paleontologic resources specialist if significant fossil resources are found and recovered during project-related surveys, monitoring and mitigation. ***Protocol:*** The final report shall include (but not be limited to) the survey report(s), methodology, and recommendations; locality records and maps; description and inventory list of recovered fossil materials; determinations of sensitivity and significance; summary of data recovery and other mitigation activities; results and findings of any special analyses conducted on recovered paleontologic resource materials and data; research questions answered or raised by the data from the project; and the name and location of the public institution receiving the recovered paleontologic resources for curation.	The project owner shall submit a copy of the draft Final Paleontologic Resources Report to the CPM for review, comment and written approval. The draft Final Paleontologic Resources Report shall be submitted to the CPM within ninety (90) days following completion of the analysis of the recovered fossil materials and preparation of text and related information, such as maps, diagrams, tables, charts, photos, etc.
PAL-12	The project owner, through the designated paleontologic resources specialist, shall submit an original, or an original-quality, copy of the CPM-approved Final Paleontologic Resources Report to the public institution receiving the recovered data and materials for curation, to the Museum of Paleontology at UC Berkeley, and to the appropriate regional information center(s). A legible copy of the approved Final Paleontologic Resources Report shall be filed with the CPM, with a request for confidentiality if needed to protect any sensitive resources or sites. ***Protocol:*** The copies of the CPM-approved Final Report sent to the entities identified above shall include the following (as applicable to the project findings set forth in the final report): clean and reproducible original copies of all text; originals of any topographic maps showing site and resource locations, boundaries of underlying rock units and stratigraphy; original or clear copies of drawings of significant paleontologic resource materials found during pre-construction surveys, during project-related monitoring, data recovery, and mitigation; and photographs (including a set of negatives, if possible) of the locality(ies) and the various paleontologic resource materials recovered during project monitoring and mitigation and subjected to post-recovery analysis and evaluation.	The project owner shall maintain, in its compliance files, copies of all documentation related to the filing of the original materials and the CPM-approved Final Paleontologic Resources Report with the public institution receiving the data and recovered materials for curation, the UC Museum of Paleontology at Berkeley, and the appropriate paleontologic information repository(ies). If no significant paleontologic resources were recorded or recovered, then the CPM-approved Preliminary Paleontologic Resources Report shall serve as the final report and shall be filed with these same entities.
PAL-13	Within thirty (30) days following filing of the Final Paleontologic Report with the appropriate entities, the project owner shall deliver for curation all paleontologic resource materials collected during data recovery and mitigation for the project. The materials shall be delivered for curation into a public repository which meets Society for Vertebrate Paleontology (SVP) requirements for the curation of paleontologic resources.	The project owner, through the designated paleontologic resources specialist, shall maintain in its project history or compliance files copies of signed contracts or agreements with the museum(s), university(ies), or other appropriate public repository(ies), to which the project owner has provided for delivery and curation of all the paleontologic resource materials collected during data recovery and site mitigation for the project.
ALTERNATIVES (NO CONDITIONS)		
FACILITY DESIGN		
GEN-1	The project owner shall design, construct and inspect the project in accordance with the California Building Code (CBC) and all other applicable LORS listed in Appendices 9A through 9G of the Application for certification (AFC), in effect at the time initial design plans are submitted to the CBO for review and approval. The CBC in effect is that edition that has been adopted by the California Building Standards Commission, and published at least 180 days previously. In the event the SPP is subject to the 1998 CBC, the 1995 CBC provisions identified herein shall be replaced with the applicable successor provisions. The purpose of the code is to provide minimum standards to safeguard life or limb, health, property and public welfare by regulating and controlling the design, construction, quality of materials, use and occupancy, location and maintenance of all buildings and structures and certain equipment regulated by the CBC. Where, in any specific case, different sections of the code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.	Within 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) after receipt of the Certificate of Occupancy, the project owner shall submit to the CPM a statement of verification, signed by the responsible engineer, attesting that all design, construction, installation and inspection requirements of the applicable LORS and the Commission's Decision have been met for facility design. The project owner shall provide the CPM a copy of the Certificate of Occupancy in the next Monthly Compliance Report after receipt of the permit from the CBO [Section 109 — Certificate of Occupancy.]

GEN-2	The project owner shall furnish to the California Energy Commission Compliance Project Manager (CPM) and to the CBO, a schedule of facility design submittals, a Master Drawing List, and a Master Specifications List. The schedule shall contain a description and list of proposed submittal packages for design, calculations, and specifications for major structures and equipment (see a list of major structures and equipment below). To facilitate audits by commission staff, the project owner shall provide designated packages to the CPM when requested. All the Sections, Chapters, Appendices and Tables, unless otherwise stated, refer to Sections, Chapters, Appendices and Tables of the 1995 California Building Code. FACILITY DESIGN 514 October 19, 1998 **Major Structures** Combustion Turbine Generator (CTG) Pedestal and Foundation Steam Turbine Generator (STG) Pedestal and Foundation CTG Enclosure Structure STG Enclosure Structure Air Inlet Filtration with Evaporative Cooler Structure Cooling Tower Heat Recovery Steam Generator (HRSG) Structure and Foundation Exhaust Stack and Foundation Field-Fabricated Tanks and Foundations Shop-Fabricated Tanks and Foundations Condenser Support Structure and Foundations Equipment Foundations (compressors, pumps, transformers) Switchyard Control/Administration Building Pipe Rack Structures Transformer Dead end Structure Major Equipment CTG STG Fired HRSG Shop-Fabricated Pressure Vessels STG Condenser Main Step-up Transformers Boiler Feed Pumps Condensate Pumps Switchgear Cycle Water Chemical Storage	At least 60 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The project owner shall provide schedule updates in the Monthly Compliance Report.
GEN-3	The project owner shall make payments to the CBO equivalent to the fees listed in Chapter 1, Section 107 and Table 1-A — Building Permit Fees, Appendix Chapter 33, Section 3310 and Table A-33-A — Grading Plan Review Fees, and Table A-33-B — Grading Permit Fees. If Yuba City, Sutter County or Colusa County has adjusted the CBC fees, for design review, plan check and construction inspection, the project owner shall pay the adjusted fees.	The project owner shall make the required payments to the CBO at the time of submittal of the plans, design calculations, specifications, or soil reports. The October 19, 1998 515 FACILITY DESIGN

GEN-4	Prior to the start of site preparation, the project owner shall assign a California registered architect, structural engineer or civil engineer, as a resident engineer (RE), to be in general responsible charge of the project. [Building Standards Administrative Code (part 1, title 24, C.C.R.), Section 4-209 — Designation of Responsibilities.] The RE may delegate responsibility for portions of the project to other registered engineers. Registered mechanical and electrical engineers may be delegated responsibility for mechanical and electrical portions of the project respectively. A project may be divided into parts, provided each part is clearly defined as a distinct unit. Separate assignment of general responsible charge may be made for each designated part. *Protocol:* The RE shall: 1. monitor construction progress to ensure compliance with the design intent; 2. ensure that construction of all the facilities conforms, in every material respect, to the applicable LORS, approved plans, and specifications; 3. prepare documents to initiate changes in the approved drawings and specifications when directed by the project owner or as required by conditions on the project; 4. be responsible for providing the project inspectors and testing agency(ies) with complete and up-to-date set(s) of stamped drawings, plans, specifications and other required documents; 5. be responsible for the timely submittal of construction progress reports to the CBO from the project inspectors, the contractor, and other engineers who have been delegated responsibility for portions of the project; and 6. be responsible for notifying the CBO of corrective action or the disposition of items noted on laboratory reports or other tests as not conforming to the approved plans and specifications. The RE shall have the authority to halt construction and to require changes or remedial work if the work does not conform to applicable requirements. FACILITY DESIGN 516 October 19, 1998 If the RE or the delegated engineers are reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.	At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the name, qualifications and registration number of the RE and any other delegated engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the RE and other delegated engineer(s) within five days of the approval. If the RE or the delegated engineer(s) are subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-5	Prior to the start of site preparation, the project owner shall assign at least one of each of the following California registered engineers to the project: A) a civil engineer; B) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; C) a design engineer who is either a structural engineer or a civil engineer who is fully competent and proficient in the design of power plant structures and equipment supports; D) a mechanical engineer; and E) an electrical engineer. [California Business and Professions Code Section 6704 et seq; and Section 6730 and 6736. Requires state registration to practice as a civil engineer or Structural Engineer in California.] The tasks performed by the civil, mechanical, electrical or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g. proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer. The project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of the lead engineer responsible for each segment. [Section 104.2 — Powers and Duties of Building Official.] f any one of the designated engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for October 19, 1998 517 FACILITY DESIGN review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer. ***Protocol: - A:*** The civil engineer shall: 1. design (or be responsible for design), stamp, and sign all plans, calculations, and specifications for proposed site work, civil works, and related facilities to comply with the Energy Commission Decision. At a minimum, these include: grading, site preparation, excavation, compaction, construction of secondary containment, foundations, erosion and sedimentation control structures, drainage facilities, underground utilities, culverts, site access roads, and sanitary sewer systems; and 2. provide consultation to the RE during the construction phase of the project, and recommend changes in the design of the civil works facilities and changes in the construction procedures. **Protocol: - B:** The geotechnical engineer or civil engineer experienced and knowledgeable in the practice of soils engineering: 1. review all the engineering geology reports, and prepare a final soils grading report; 2. prepare the soils engineering reports required by Appendix Chapter 33, Section 3309.5 — Soils Engineering Report, and Section 3309.6 — Engineering Geology Report. 3. be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in Appendix Chapter 33, Section 3317 —Grading Inspections. 4. recommend field changes to the civil engineer and RE; 5. review the geotechnical report, field exploration report, laboratory tests, and engineering analyses detailing the nature and extent of the site soils that may be susceptible to liquefaction, rapid settlement or collapse when saturated under load; and 6. prepare reports on foundation investigation to comply with Chapter 18, Section 1804 — Foundation Investigations. This engineer shall be authorized to halt earthwork and to require changes, if site conditions are unsafe or do not conform with predicted conditions used as a basis for design of earthwork or foundations. [Section 104.2.4 — Stop orders.] FACILITY DESIGN 518 October 19, 1998 ***Protocol: - C:*** The design engineer shall: 1. be directly responsible for the design of the proposed structures and equipment supports; 2. provide consultation to the RE during design and construction of the project; 3. monitor construction progress to ensure compliance with the design intent; 4. evaluate and recommend necessary changes in design; and 5. prepare and sign all major building plans, specifications and calculations. ***Protocol: - D:*** The mechanical engineer shall be responsible for, and sign	At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all the responsible engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the engineers within five days of the approval. If the designated responsible engineer is subsequently reassigned or replaced, the project owner has 15 days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

	and stamp a statement with, each mechanical submittal to the CBO stating that the proposed final design plans, specifications, and calculations conform with all of the mechanical engineering design requirements set forth in the Energy Commission Decision. ***Protocol: - E:*** The electrical engineer shall: 1. be responsible for the electrical design of the project; and 2. sign and stamp all electrical design drawings, plans, specifications, and calculations.	
GEN-6	Prior to the start of an activity requiring special inspection, the project owner shall assign to the project, qualified and certified special inspector(s) who shall be responsible for the special inspections required by Chapter 17, Section 1701 — Special Inspections and Section 1701.5 October 19, 1998 519 FACILITY DESIGN— Type of Work (requiring special inspection), Section 106.3.5 —Inspection and observation program. ***Protocol:*** The Special Inspector shall: 1. be a qualified person who shall demonstrate competence, to the satisfaction of the CBO, for inspection of the particular type of construction requiring special or continuous inspection; 2. observe the work assigned for conformance with the approved design drawings and specifications; 3. furnish inspection reports to the CBO and RE. All discrepancies shall be brought to the immediate attention of the RE for correction, then, if uncorrected, to the CBO and the CPM; and 4. submit a final signed report to the RE, CBO, and CPM, stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved plans and specifications and the applicable provisions of the applicable edition of the CBC. Welding performed on-site requiring special inspection (including structural, piping, tanks and pressure vessels) shall be inspected by a certified weld inspector (certified AWS and/or ASME as applicable).	At least 15 days prior to the start of an activity requiring special inspection, the project owner shall submit to the CBO for review and approval, with a copy to the CPM, the name(s) and qualifications of the certified weld inspector(s), or other certified special inspector(s) assigned to the project to perform one or more of the duties set forth above. The project owner shall also submit to the CPM a copy of the CBO's approval of the qualifications of all special inspectors in the next Monthly Compliance Report. If the special inspector is subsequently reassigned or replaced, the project owner has five days in which to submit the name and qualifications of the newly assigned special inspector to the CBO for approval. The project owner shall notify the CPM of the CBO's approval of the newly assigned inspector within five days of the approval.
GEN-7	The project owner shall keep the CBO informed regarding the status of construction. If any discrepancy is discovered during construction, the project owner shall prepare and submit a non-conformance report (NCR) describing the nature of the discrepancy to the CBO. The NCRs shall reference this condition of certification, and applicable sections of the applicable edition of the CBC. FACILITY DESIGN 520 October 19, 1998	The project owner shall submit NCRs, as necessary, within five days, and shall submit a periodic construction progress report to the CBO according to the reporting frequency required by the CBO. A list of the NCRs for the reporting month shall also be included in the next Monthly Compliance Report.
GEN-8	The project owner shall obtain the CBO's final approval of all completed work. The project owner shall request the CBO to inspect the completed structure and review the submitted documents. When the work and the "as-built" and "as graded" plans conform with the approved final plans, the project owner shall notify the CPM regarding the CBO's final approval. The marked up "as-built" drawings for the construction of structural and architectural work shall be submitted to the CBO. Changes approved by the CBO shall be identified on the "as-built" drawings. [Section 108 — Inspections.]	Within 15 days of the completion of any work, the project owner shall submit to the CBO, with a copy to the CPM, (a) written notice that the completed work is ready for final inspection, and (b) a signed statement that the work conforms to the final approved plans.
GEO-1	Prior to the start of construction, the project owner shall assign to theproject an engineering geologist(s), certified by the State of California, tocarry out the duties required by Appendix Chapter 33, Section 3309.4. The certified engineering geologist(s) assigned must be approved by the CPM (the functions of the engineering geologist can be performed by the responsible geotechnical engineer, if that person has the appropriate California license).	At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction, the project owner shall submit to the CPM for approval, the name(s) and license number(s) of the certified engineering geologist(s) assigned to the project. The submittal should include a statement that CPM approval is needed. The CPM will approve or disapprove of the engineering geologist(s) and will notify the project owner of its findings within 15 days of receipt of the submittal. If the engineering geologist(s) is subsequently replaced, the project owner shall submit for approval the name(s) and license number(s) of the newly assigned individual to the CPM. The CPM will approve or disapprove of the engineering geologist(s) and will notify the project owner of the findings ithin 15 days of receipt of the notice of personnel change.

GEO-2	The assigned engineering geologist shall carry out the duties required byAppendix Chapter 33, Section 3309.4 — Engineered Grading Requirement, and Section 3318.1 — Final Reports. Those duties are: 1. Prepare the Engineering Geology Report. This report shall accompany the Plans and Specifications when applying to the CBO for the grading permit. 2. Monitor geologic conditions during construction. 3. Prepare the Final Geologic Report. ***Protocol:*** The Engineering Geology Report required by Appendix Chapter 33, Section 3309.3 — Grading Designation, and shall include an adequate description of the geology of the site, conclusions and recommendations regarding the effect of geologic conditions on the proposed development, and an opinion on the adequacy, for the intended use, of the site as affected by geologic factors. The Final Geologic Report to be completed after completion of grading, as required by Appendix Chapter 33, Section 3318.1, and shall contain the following: A final description of the geology of the site and any new information disclosed during the grading and the effect of same on recommendations incorporated in the approved grading plan. Engineering geologists shall submit a statement that, to the best of their knowledge, the work within their area of responsibility is in accordance with the approved Engineering Geology Report and applicable provisions of this chapter.	(1) Within 15 days after submittal of the application(s) for grading permit(s) to the CBO, the project owner shall submit a signed statement to the CPM stating that the Engineering Geology Report has been submitted to the CBO as a supplement to the plans and specifications and that the recommendations contained in the report are incorporated into the plans and specifications; (2) Within 90 days following completion of the final grading, the project owner shall submit copies of the Final Geologic Report required by Appendix Chapter 33, Section 3309.3, to the CPM and the CBO. 1.
CIVIL-1	Prior to the start of site grading, the project owner shall submit to the CBO for review and approval the following: 1. design of the proposed drainage structures and the grading plan; 2. an erosion and sedimentation control plan; 3. related calculations and specifications, signed and stamped by the responsible civil engineer; and 4. soils report as required by Appendix Chapter 33, Section 3309.5 — Soils Engineering Report and Section 3309.6 — Engineering Geology Report.	At least 15 days prior to the start of site grading, the project owner shall submit the documents described above to the CBO for review and approval. In the next Monthly Compliance Report following the CBO's approval, the project owner shall FACILITY DESIGN 522 October 19, 1998 submit a written statement certifying that the documents have been approved by the CBO.
CIVIL-2	The resident engineer shall, if appropriate, stop all earthwork and construction in the affected areas when the responsible geotechnical engineer or civil engineer experienced and knowledgeable in the practice of soils engineering identifies unforeseen adverse soil or geologic conditions. The project owner shall submit modified plans, specifications and calculations to the CBO based on these new conditions. The project owner shall obtain approval from the CBO before resuming earthwork and construction in the affected area. [Section 104.2.4 — Stop orders.]	The project owner shall notify the CPM, within five days, when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil conditions. Within five days of the CBO's approval, the project owner shall provide to the CPM a copy of the CBO's approval to resume earthwork and construction in the affected areas.
CIVIL-3	The project owner shall perform inspections in accordance with Section 108 — Inspections, Chapter 17, Section 1701.6 — Continuous and periodic special inspection and Appendix Chapter 33, Section 3317 —Grading inspection. All plant site grading operations shall be subject to inspection by the CBO and the CPM. If, in the course of inspection, it is discovered that the work is not being done in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the CBO, and the CPM. The project owner shall prepare a written report detailing all discrepancies and non-compliance items, and the proposed corrective action and send copies to the CBO and the CPM.	Within five days of the discovery of any discrepancies, the resident engineer shall transmit to the CBO and the CPM a non-conformance report (NCR), and the proposed corrective action. Within five days of resolution of the NCR, the project owner shall submit the details of the corrective action to the CBO and the CPM. A list of NCRs for the reporting month shall also be included in the following Monthly Compliance Report.
CIVIL-4	After completion of finished grading and erosion and sedimentation control and drainage facilities, the project owner shall obtain the CBO's approval of the final "as-graded" grading plans, and final "as-built" plans for the erosion and sedimentation control facilities. [Section 109 —Certificate of Occupancy]	Within 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) of the completion of the erosion and sediment control mitigation and drainage facilities, the project owner shall submit to the CBO the October 19, 1998 523 FACILITY DESIGN responsible civil engineer's signed statement that the installation of the facilities and all erosion control measures were completed in accordance with the final approved combined grading plans, and that the facilities are adequate for their intended purposes. The project owner shall submit a copy of this report to the CPM in the next Monthly Compliance Report.

GEO-2	The assigned engineering geologist shall carry out the duties required byAppendix Chapter 33, Section 3309.4 — Engineered Grading Requirement, and Section 3318.1 — Final Reports. Those duties are: 1. Prepare the Engineering Geology Report. This report shall accompany the Plans and Specifications when applying to the CBO for the grading permit. 2. Monitor geologic conditions during construction. 3. Prepare the Final Geologic Report. ***Protocol:*** The Engineering Geology Report required by Appendix Chapter 33, Section 3309.3 — Grading Designation, and shall include an adequate description of the geology of the site, conclusions and recommendations regarding the effect of geologic conditions on the proposed development, and an opinion on the adequacy, for the intended use, of the site as affected by geologic factors. The Final Geologic Report to be completed after completion of grading, as required by Appendix Chapter 33, Section 3318.1, and shall contain the following: A final description of the geology of the site and any new information disclosed during the grading and the effect of same on recommendations incorporated in the approved grading plan. Engineering geologists shall submit a statement that, to the best of their knowledge, the work within their area of responsibility is in accordance with the approved Engineering Geology Report and applicable provisions of this chapter.	(1) Within 15 days after submittal of the application(s) for grading permit(s) to the CBO, the project owner shall submit a signed statement to the CPM stating that the Engineering Geology Report has been submitted to the CBO as a supplement to the plans and specifications and that the recommendations contained in the report are incorporated into the plans and specifications; (2) Within 90 days following completion of the final grading, the project owner shall submit copies of the Final Geologic Report required by Appendix Chapter 33, Section 3309.3, to the CPM and the CBO. 1.
CIVIL-1	Prior to the start of site grading, the project owner shall submit to the CBO for review and approval the following: 1. design of the proposed drainage structures and the grading plan; 2. an erosion and sedimentation control plan; 3. related calculations and specifications, signed and stamped by the responsible civil engineer; and 4. soils report as required by Appendix Chapter 33, Section 3309.5 — Soils Engineering Report and Section 3309.6 — Engineering Geology Report.	At least 15 days prior to the start of site grading, the project owner shall submit the documents described above to the CBO for review and approval. In the next Monthly Compliance Report following the CBO's approval, the project owner shall FACILITY DESIGN 522 October 19, 1998 submit a written statement certifying that the documents have been approved by the CBO.
CIVIL-2	The resident engineer shall, if appropriate, stop all earthwork and construction in the affected areas when the responsible geotechnical engineer or civil engineer experienced and knowledgeable in the practice of soils engineering identifies unforeseen adverse soil or geologic conditions. The project owner shall submit modified plans, specifications and calculations to the CBO based on these new conditions. The project owner shall obtain approval from the CBO before resuming earthwork and construction in the affected area. [Section 104.2.4 — Stop orders.]	The project owner shall notify the CPM, within five days, when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil conditions. Within five days of the CBO's approval, the project owner shall provide to the CPM a copy of the CBO's approval to resume earthwork and construction in the affected areas.
CIVIL-3	The project owner shall perform inspections in accordance with Section 108 — Inspections, Chapter 17, Section 1701.6 — Continuous and periodic special inspection and Appendix Chapter 33, Section 3317 —Grading inspection. All plant site grading operations shall be subject to inspection by the CBO and the CPM. If, in the course of inspection, it is discovered that the work is not being done in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the CBO, and the CPM. The project owner shall prepare a written report detailing all discrepancies and non-compliance items, and the proposed corrective action and send copies to the CBO and the CPM.	Within five days of the discovery of any discrepancies, the resident engineer shall transmit to the CBO and the CPM a non-conformance report (NCR), and the proposed corrective action. Within five days of resolution of the NCR, the project owner shall submit the details of the corrective action to the CBO and the CPM. A list of NCRs for the reporting month shall also be included in the following Monthly Compliance Report.
CIVIL-4	After completion of finished grading and erosion and sedimentation control and drainage facilities, the project owner shall obtain the CBO's approval of the final "as-graded" grading plans, and final "as-built" plans for the erosion and sedimentation control facilities. [Section 109 —Certificate of Occupancy]	Within 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) of the completion of the erosion and sediment control mitigation and drainage facilities, the project owner shall submit to the CBO the October 19, 1998 523 FACILITY DESIGN responsible civil engineer's signed statement that the installation of the facilities and all erosion control measures were completed in accordance with the final approved combined grading plans, and that the facilities are adequate for their intended purposes. The project owner shall submit a copy of this report to the CPM in the next Monthly Compliance Report.

STRUC-1	Prior to the start of any increment of construction, the project owner shall submit to the CBO for review and approval the applicable designs, plans and drawings, and a list of those project structures, components and major equipment items that will undergo dynamic structural analysis. Designs, plans and drawings shall be those for: 1. major project structures; 2. major foundations, equipment supports and anchorages; 3. large field fabricated tanks; 4. turbine/generator pedestal; and 5. switchyard structures. ***Protocol:*** The project owner shall: 1. obtain agreement with the CBO on the list of those structures, components and major equipment items to undergo dynamic structural analysis; 2. meet the pile design requirements of the 1995 CBC. Specifically, Section 1807 — General Requirements, Section 1808 — Specific Pile Requirements, and Section 1809 — Foundation Construction (in seismic zones 3 and 4). 3. obtain approval from the CBO for the final design plans, specifications, calculations, soils reports, and applicable quality control procedures. If there are conflicting requirements, the more stringent shall govern (i.e., highest loads, or lowest allowable stresses shall govern). All plans, calculations, and specifications for foundations that support structures shall be filed concurrently with the structure plans, calculations, and specifications, [Section 108.4 — Approval Required]; 4. submit to the CBO the required number of copies of the structural plans, specifications, calculations, and other required documents of the designated major structures at least 90 days prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation, [Section 106.4.2 — Retention of plans, Section 106.3.2 — Submittal documents.]; and 5. ensure that the final plans, calculations, and specifications clearly reflect the inclusion of approved criteria, assumptions, and FACILITY DESIGN 524 October 19, 1998 methods used to develop the design. The final designs, plans, calculations and specifications shall be signed and stamped by the responsible design engineer. [Section 106.3.4 — Architect or engineer of record.]	At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of any increment of construction, the project owner shall submit to the CBO, with a copy to the CPM, the responsible design engineer's signed statement that the final design plans, specifications and calculations conform with all of the requirements set forth in the Commission's Decision. If the CBO discovers non-conformance with the stated requirements, the project owner shall resubmit the corrected plans to the CBO within 20 days of receipt of the non-conforming submittal, with a copy of the transmittal letter to the CPM. The project owner shall submit to the CPM a copy of a statement from the CBO that the proposed structural plans, specifications, and calculations have been approved and are in conformance with the requirements set forth in the applicable LORS.
STRUC-2	The project owner shall submit to the CBO the required number of sets of the following: 1. concrete cylinder strength test reports (including date of testing, date sample taken, design concrete strength, tested cylinder strength, age of test, type and size of sample, location and quantity of concrete placement from which sample was taken, and mix design designation and parameters); 2. concrete pour sign-off sheets; 3. bolt torque inspection reports (including location of test, date, bolt size, and recorded torques); 4. field weld inspection reports (including type of weld, location of weld, inspection of non-destructive testing (NDT) procedure and results, welder qualifications, certifications, qualified procedure description or number [ref: AWS]; and 5. reports covering other structure activities requiring special inspections shall be in accordance with Chapter 17, Section 1701— Special Inspections, Section 1701.5 — Type of Work (requiring special inspection), Section 1702 — Structural Observation and Section 1703 — Nondestructive Testing.	If a discrepancy is discovered in any of the above data, the project owner shall, within five days, prepare and submit an NCR describing the nature of the October 19, 1998 525 FACILITY DESIGN discrepancies to the CBO, with a copy of the transmittal letter to the CPM. The NCR shall reference the condition(s) of certification and applicable CBC chapter and section. Within five days of resolution of the NCR, the project owner shall submit a copy of the corrective action to the CBO and the CPM. The project owner shall transmit a copy of the CBO's approval or disapproval of the corrective action to the CPM within 15 days. If disapproved, the project owner shall, within five days, advise the CPM of the reason for disapproval, and the revised corrective action to obtain CBO's approval.
STRUC-3	The project owner shall submit to the CBO design changes to the final plans required by Chapter 1, Section 106.3.2 — Submittal documents, and 106.3.3 — Information on plans and specifications, including the revised drawings, specifications, calculations, and a complete description of, and supporting rationale for, the proposed changes, and shall give the CBO prior notice of the intended filing.	On a schedule suitable to the CBO, the project owner shall notify the CBO of the intended filing of design changes, and shall submit the required number of sets of revised drawings and the required number of copies of the other above-mentioned documents to the CBO, with a copy of the transmittal letter to the CPM. The project owner shall notify the CPM, via the Monthly Compliance Report, when the CBO has approved the revised plans.

STRUC-4	Tanks and vessels containing quantities of hazardous materials exceeding those amounts specified in Table 3E of Chapter 3, in the 1995 California Building code shall, at a minimum, be designed to comply with Occupancy Category 2 (Hazardous facilities). Table 16-K of Chapter 16, in the 1995 CBC which requires use of the following seismic design criteria: I = 1.25, I p = 1.5 and I w = 1.15.	At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of installation of the tanks or vessels containing sufficient quantities of highly toxic or explosive substances that would be hazardous to the safety of the general public if released, the project owner shall submit to the CBO for review and approval, final design plans, specifications, and calculations, including a copy of the signed and stamped engineer's certification. The project owner shall send copies of the CBO approvals of plan checks to the CPM in the following Monthly Compliance Report. The project owner shall also transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance eport following completion of any inspection.
MECH-1	Prior to the start of any increment of piping construction, the project owner shall submit, for CBO review and approval, the proposed final design drawings, specifications and calculations for each plant piping FACILITY DESIGN 526 October 19, 1998 system (exclude: domestic water, refrigeration systems, and small bore piping, i.e., piping and tubing with a diameter equal to or less than two and one-half inches). The submittal shall also include the applicable QA/QC procedures. The project owner shall design and install all piping, other than domestic water, refrigeration, and small bore piping to the applicable edition of the CBC. Upon completion of construction of any piping system, the project owner shall request the CBO's inspection approval of said construction. [Section 106.3.2 — Submittal documents, Section 108.3 — Inspection Requests.] ***Protocol:*** The responsible mechanical engineer shall submit a signed and stamped statement to the CBO when: 1. the proposed final design plans, specifications, and calculations conform with all of the piping requirements set forth in the Commission Decision; and 2. all of the other piping systems, except domestic water, refrigeration systems, and small bore piping, have been designed, fabricated, and installed in accordance with all applicable ordinances, regulations, laws and industry standards, including, as applicable: -- American National Standards Institute (ANSI) B31.1 (Power Piping Code); -- ANSI B31.2 (Fuel Gas Piping Code); -- ANSI B31.3 as applicable (Chemical Plant and Petroleum Refinery Piping Code); -- ANSI B31.8 (Gas Transmission and Distribution Piping Code); and -- Specific City/County code. The CBO may require the project owner, as necessary, to employ special inspectors to report directly to the CBO to monitor shop fabrication or equipment installation. [Section 104.2.2 — Deputies.]	At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of any increment of piping construction, the project owner shall submit to the CBO for approval, with a copy of the transmittal letter to the CPM, the proposed final design plans, specifications, calculations and quality control procedures for that increment of construction of piping systems, including a copy of the signed and stamped engineer's certification of conformance with the Commission Decision. The project owner shall transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.
MECH-2	For all pressure vessels installed in the plant, the project owner shall submit to the CBO and California Occupational Safety and Health Administration (Cal-OSHA), prior to operation, the code certification papers and other documents required by the applicable LORS. Upon completion of the installation of any pressure vessel, the project owner shall request the appropriate CBO and/or Cal-OSHA inspection of said installation. [Section 108.3 — Inspection Requests.] ***Protocol:*** The project owner shall: 1. ensure that all boilers and fired and unfired pressure vessels are designed, fabricated and installed in accordance with the appropriate section of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, or other applicable code. Vendor certification, with identification of applicable code, shall be submitted for prefabricated vessels and tanks; and 2. have the responsible design engineer submit a statement to the CBO that the proposed final design plans, specifications, and calculations conform to all of the requirements set forth in the appropriate ASME Boiler and Pressure Vessel Code or other applicable codes.	At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of on-site fabrication or installation of any pressure vessel, the project owner shall submit to the CBO for review and approval, final design plans, specifications, and calculations, including a copy of the signed and stamped engineer's certification, with a copy of the transmittal letter to the CPM. The project owner shall send copies of the CBO plan check approvals to the CPM in the following Monthly Compliance Report. The project owner shall also transmit a copy of the CBO's and/or Cal-OSHA inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-3	Prior to the start of construction of any heating, ventilating, air conditioning (HVAC) or refrigeration system, the project owner shall submit to the CBO for review and approval the design plans, specifications, calculations, and quality control procedures for that system. Packaged HVAC systems, where used, shall be identified with the appropriate manufacturer's data sheets. ***Protocol:*** The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the applicable edition of the CBC. Upon completion of any increment of construction, the project owner shall request the CBO's inspection and approval of said construction. The final plans, FACILITY DESIGN 528 October 19, 1998 specifications and calculations shall include approved criteria, assumptions, and methods used to develop the design. In addition, the responsible mechanical engineer shall sign and stamp all plans, drawings, and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications and calculations conform with the applicable LORS. [Section 108.7 — Other Inspections, Section 106.3.4 — Architect or engineer of record.]	At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction of any HVAC or refrigeration system, the project owner shall submit to the CBO the required HVAC and refrigeration calculations, plans, and specifications, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable edition of the CBC, with a copy of the transmittal letter to the CPM. The project owner shall send copies of CBO comments and approvals to the CPM in the next Monthly Compliance Report. The project owner shall transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.
MECH-4	Prior to the start of each increment of plumbing construction, the project owner shall submit for CBO's approval the final design plans, specifications, calculations, and QA/QC procedures for all plumbing systems, potable water systems, drainage systems (including sanitary drain and waste), toilet rooms, building energy conservation systems, and temperature control and ventilation systems, including water and sewer connection permits issued by the local agency. Upon completion of any increment of construction, the project owner shall request the CBO's inspection approval of said construction. [Section 108.3 — Inspection Requests, Section 108.4 — Approval Required.] ***Protocol:*** The project owner shall design, fabricate, and install: 1. plumbing, potable water, all drainage systems, toilet rooms, in accordance with Title 24, California Code of Regulations, Division 5, Part 5, and the California Plumbing Code (or other relevant section(s) of the currently adopted California Plumbing Code and Title 24, california Code of Regulations); and 2. building energy conservation systems and temperature control and ventilation systems in accordance with Title 24, California Code of Regulations, Division 5, Chapter 2-53, Part 2. The final plans, specifications, and calculations shall clearly reflect the inclusion of approved criteria, assumptions, and methods used to develop the design. In addition, the responsible mechanical engineer shall stamp and sign all plans, October 19, 1998 529 FACILITY DESIGN drawings, and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications, and calculations conform with all of the requirements set forth in the Commission Decision.	At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction of any of the above systems, the project owner shall submit to the CBO the final design plans, specifications and calculations, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable edition of the CBC, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report. The project owner shall transmit a copy of the CBO's inspection approvals to the CPM in the next Monthly Compliance Report following completion of that increment of construction.
ELEC-1	For the 13.8 kV and lower systems, the project owner shall not begin any increment of electrical construction until plans for that increment have been approved by the CBO. These plans, together with design changes and design change notices, shall remain on the site for one year after completion of construction. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS. [Section 108.4 — Approval Required, and Section 108.3 Inspection Requests.]	At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of electrical construction, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations, including a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with the applicable LORS, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report. The following activities shall be reported in the Monthly Compliance Report: 1. receipt or delay of major electrical equipment; 2. testing or energization of major electrical equipment; and 3. The number of electrical drawings approved, submitted for approval, and still to be submitted.

ELEC-2	The project owner shall submit to the CBO the required number of copies of items A and B for review and approval and one copy of item C: [Section 106.3.2 — Submittal documents.] A. Final plant design plans to include: 1. one-line diagrams for the 13.8 kV, 4.16 kV and 480 V systems; FACILITY DESIGN 530 October 19, 1998 2. system grounding drawings; 3. other plans as required by the CBO. B. Final plant calculations to establish: 1. short-circuit ratings of plant equipment; 2. ampacity of feeder cables; 3. voltage drop in feeder cables; 4. system grounding requirements; 5. coordination study calculations for fuses, circuit breakers and protective relay settings for the 13.8 kV, 4.16 kV and 480 V systems; 6. system grounding requirements; 7. lighting energy calculations; and 8. other reasonable calculations as customarily required by the CBO. C. A signed statement by the registered electrical engineer certifying that the proposed final design plans and specifications conform to requirements set forth in the Commission Decision.	At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of electrical equipment installation, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations, for the items enumerated above, including a copy of the signed and stamped statement from the responsible electrical engineer certifying compliance with the applicable LORS. The project owner shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.
POWERPLANT RELIABILITY (NO CONDITIONS)		
POWERPLANT EFFICIENCY (NO CONDITIONS)		
TRANSMISSION SYSTEM ENGINEERING		
TSE-1	TSE-1 The project owner shall ensure that the design, construction and operation of the proposed transmission facilities will conform to requirements 1a through 1e listed below. The substitution of CPM approved "equivalent" equipment and equivalent switchyard configurations is acceptable. a. The project 230 kilovolt project switchyard shall include a four circuit breaker ring bus with breaker ratings of 40,000 amperes (interrupting) and ring bus, switches, breakers and buswork rated at 2,000 ampere continuous. b. An approximately 4 mile double circuit configuration line operated as a single circuit 230 kilovolt line using steel pole construction with conductors sized at a minimum of 1272 thousand circular mill Aluminum Conductor Steel Reinforced shall be constructed to the O'Banion South switching station site. c. Termination facilities at the Sutter Bypass 230 kilovolt switching station, the power plant switchyard, and transmission line shall comply with applicable Western interconnection standards (CPUC General Order 95 and National Electric Safety Code). Bus work, switches and breakers at the Sutter Bypass switching station shall be rated 3000 ampere continuous with breaker interrupting ratings of 40,000 ampere. d. Outlet line crossings shall be coordinated with the transmission line owner/operator and comply with the owner's standards. e. A direct transfer tripping scheme (remedial action scheme) which shuts down one 175 megawatt, two 175 megawatt units, or reduces the plant output upon loss of one of the Sutter Bypass switching station to Elverta lines shall be provided and activated where appropriate.	At least 30 days prior to start of construction of transmission facilities, the project owner shall submit for approval to the CPM electrical one-line diagrams signed and sealed by a registered professional electrical engineer in responsible charge, a route map, and an engineering description of equipment and the configurations covered by requirements 1a through 1e above. Substitution of equipment and switchyard configurations shall be identified and justified by the project owner for CPM approval.
TSE-2	The project owner shall inform the CPM of any impending changes which may not conform to the requirements of 1a through 1e of TSE-1, and request CPM approval to implement such changes. A detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change shall accompany the request. Construction involving changed equipment or switchyard configurations shall not begin without prior written approval of the changes by the CPM.	At least 30 days prior to construction of transmission facilities, the project owner shall inform the CPM of any impending changes which may not conform to requirements 1a through 1e of TSE-1 and request CPM approval to implement such changes.

TSE-3	The project owner shall be responsible for the inspection of the transmission facilities during and after project construction and any subsequent CPM approved changes thereto, to ensure conformance with CPUC General Order 95 and Western's interconnection standards and these Conditions. In case of non-conformance, the project owner shall inform the CPM in writing of such non-conformance and describe the corrective actions to be taken.	Within 60 days after synchronization of the project, the project owner shall transmit to the CPM an engineering description(s), one-line drawings of the "as-built" facilities signed and sealed by a registered electrical engineer in responsible charge. A statement attesting to conformance with CPUC General Order 95, Western's interconnection standards and these conditions shall be concurrently provided. Within 10 days of any non-conformance, the project owner shall submit a written notification to the CPM as described in this Condition.
TRANSMISSION LINE SAFETY AND NUISANCE		
TLSN-1	The project owner shall construct the proposed transmission line according to the requirements of GO-95 and Title 8, Section 2700 et seq. Of the California Code of Regulations.	Thirty days before start of transmission line construction, the project owner shall submit to the Commission's Compliance Project Manager (CPM) a letter signed by a California registered electrical engineer affirming that the transmission line will be constructed according the requirements of GO-95 and Title 8, Section 2700 et seq. of the California Code of Regulations.
TLSN-2	The project owner shall make every reasonable effort to identify and correct, on a case-specific basis, all complaints of interference with radio or television signals from operation of the line and related facilities. In addition to any transmission repairs, the relevant corrective actions should include, but shall not be limited to, adjusting or modifying receivers, adjusting or repairing, replacing or adding antennas, antenna signal amplifiers, filters, or lead-in cables. The project owner shall maintain written records, for a period of five years, of all complaints of radio or television interference attributable to operation together with the corrective action taken in response to each complaint. All complaints shall be recorded to include notations on the corrective action taken. Complaints not leading to a specific action or for which there was no resolution should be noted and explained. The record shall be signed by the project owner and also the complainant, if possible, to indicate concurrence with the corrective action or agreement with the justification for a lack of action.	All reports of line-related complaints shall be summarized and included in the Annual Compliance Report to the CPM.
TLSN-3	The project owner shall engage a qualified consultant to measure the strengths of the line electric and magnetic fields before beginning construction and after the line is energized. Measurements should be made at appropriate points along the route to allow verification of design assumptions relative to field strengths. The areas to be measured should include the Sutter Bypass switching station, the on-site switchyard and any residences near the right-of-way.	The project owner shall file a copy of the first set of pre-project measurements with the CPM at least 30 days before the start of construction. The post-project measurements shall be filed within 30 days after the day the line was energized.
TLSN-4	The project owner shall ensure that the transmission line right-of-way is kept free of combustible material as required under the provisions of section 4292 of the Public Resources Code and Section 1250 of the California Code of Regulations.	The project owner shall provide a summary of inspection results and any fire prevention activities along the right-of-way in the annual compliance report.
TLSN-5	The project owner shall send a letter to all owners of property within or adjacent to the right-of-way at least 60 days prior to first transmission of electricity. ***Protocol:*** The letter shall include the following: ▪ A discussion of the nature and operation of a transmission line. ▪ A discussion of the project owner's responsibility for grounding existing fences, gates, and other large permanent chargeable objects within the right-of-way regardless of ownership. ▪ A discussion of the property owner's responsibility to notify the project whenever the property owner adds or installs a metallic object which would require grounding as noted above. ▪ A statement recommending against fueling motor vehicles or other mechanical equipment underneath the line.	The project owner shall submit the proposed letter to the CPM for review and approval 30 days prior to mailing to the property owners and shall maintain a record of correspondence (notification and response) related to this requirement in a compliance file. The project owner shall notify the CPM in the first Monthly Compliance Report that letters have been mailed and that copies are on file.

TLSN-6	The project owner shall ensure the grounding of any ungrounded permanent metallic objects within the right-of-way, regardless of ownership. Such objects shall include fences, gates, and other large objects. These objects shall be grounded according to procedures specified in the National Electrical Safety Code. In the event of a refusal by the property owner to permit such grounding, the project owner shall so notify the CPM. Such notification shall include, when possible, the owner's written objection. Upon receipt of such notice, the CPM may waive the requirement for grounding the object involved.	At least 10 days before the line is energized, the project owner shall transmit to the CPM a letter confirming compliance with this condition.
FACILITY CLOSURE		
CLOSUR E-1	Prior to first energizing of the project, the project owner shall submit a contingency plan for dealing with an unplanned and/or sudden facility closure or interruption of operations other than those required for normal maintenance. The contingency plan shall provide for the following: 1. taking immediate steps to secure the facility from trespassing or encroachment; 2. removal of hazardous materials; 3. removal of hazardous wastes for closures more than 90 days in duration; 4. draining of all chemicals from storage tanks and other equipment; 5. the safe shutdown of all equipment; and 6. other necessary or prudent measures.	At least 90 days prior to first energizing the project, the project owner shall submit to the CPM and to the Assistant Director of Sutter County Community Services Department, Fire and Emergency Services for review and approval a contingency plan identifying the steps that will be taken in case of an unplanned permanent or temporary facility closure.
CLOSUR E-2	In the event of an unplanned and/or sudden facility closure or interruption of operations, the project owner shall notify the Energy Commission CPM, as well as other responsible agencies, by telephone or fax within 24 hours. The project owner shall take all necessary steps to ensure that there is no immediate danger to health and safety to or the environment from materials on the site as provided in the contingency plan described in condition CLOSURE-1. If the CPM determines that the closure is likely to be permanent or for a duration of more than twelve months, then a plan consistent with the Protocol of Condition CLOSURE-3 below shall be submitted to the CPM within 90 days of the CPM's determination (or other mutually agreed upon period of time).	The project owner shall maintain on-site the contingency plan required by Condition CLOSURE-1 identifying the steps that will be taken in case of an unplanned permanent or temporary facility closure. Within seven days of any unplanned and/or sudden facility closure or interruption of operations, the project owner shall submit a letter to the CPM describing the situation, the expected duration, and any planned actions to protect health, safety, and the environment.
CLOSUR E-3	In the event of a planned facility closure, at least 12 months (or other mutually agreed-upon period of time) prior to commencing facility closure activities, the project owner shall file a proposed facility closure plan with the Energy Commission for review and approval. ***Protocol:*** 1. The plan shall: a. Identify and discuss the proposed facility closure activities, mitigation measures, and schedule for the power plant site, transmission line corridor, and all other appurtenant facilities constructed as part of the project; b. Identify any facilities or equipment intended to remain on site after closure and the reason therefore, including any potential future use; and c. Address conformance of the plan with all applicable laws, ordinances, regulations standards, Local/regional plans in existence at the time of facility closure, and applicable Conditions of Certification. 2. Prior to submittal of the facility closure plan, a meeting shall be held between the project owner and the Commission CPM for the purpose of discussing the specific contents of the plan. 3. In the event that significant issues are associated with the plan's approval, or the desires of local officials or interested parties are inconsistent with the plan, the CPM shall hold one or more workshops and/or the Commission may hold public hearings as part of its approval procedure. 4. The project owner shall not commence facility closure activities, with the exception of measures to eliminate any immediate threats to health and safety or the environment, until Commission approval of the facility closure plan is obtained, and the project owner shall comply with any requirements the Commission may incorporate as a condition of facility closure plan approval.	The project owner shall file 125 copies (or a mutually agreed upon lesser number) of the proposed facility closure plan with the Commission. At least six months (or other mutually agreed-upon time) prior to commencing facility closure, the project owner shall participate in a workshop, if the CPM determines that a workshop is necessary, to allow the Sutter County Planning Department and other interested agencies and parties to comment on the proposed closure plan and determine if there are any changes or additional measures needed in the plan.
COMPLIANCE MONITORING (NO CONDITIONS)		
GENERAL CONDITIONS (NO CONDITIONS)		

Table AQ-33 (16): Maximum Hourly Emission Rates (lbs./hr)							
Pollutant	CTG	CTG + Duct Burner	CTG + Duct Burner + Steam Injection	CTG + Steam Injection	Hot Start-up	Cold Start-up	Shut-down
NOx	16.8	18.2	19.1	17.7	170	175	12.1
CO	16.7	20.1	34.3	30.9	902	838	12.6
VOC	1.5	3.5	3.51	1.51	1.1	1.1	1.1
SO2	3.7	3.71	4.02	4.01	2.7	2.7	2.7
PM10	9.0 0	11.5.	11.5	9.0	9.00	9.0	9.0

Table AQ-33 (17) Maximum Project Daily Emissions (lbs./day)		
	Total Emission Per CTG	Calpine Maximum SPP Daily Emissions
NOx	909	1817
CO	3264	6528
VOC	79	158
SO2	90	179
PM10	271	54

Table AQ-33 (19) Maximum Calendar Year Emissions (tons/yr.)		
	Total Emission Per CTG	Calpine Annual SPP Emission
NOx	102	205.86
CO	242	483.18
VOC	11.9	24.41
SO2	15.7	31.5
PM10	46.2	92.5

Table AQ-33 (18) Maximum Quarterly Emissions				
	January-March lb./quarter	April-June lb./quarter	July-Sept. lb./quarter	October-December lb./quarter
NOx	102,500	102,500	102,500	102,500
CO	241,600	241,600	241,600	241,600
VOC	11,850	11,850	11,850	11,850
SO2	15,750	15,750	15,750	15,750
PM10	46,200	46,200	46,200	46,200

Table AQ-42 Certificates for Air Emissions						
	January-March (pounds)	April-June (pounds)	July-September (pounds)	October-December (pounds)	Total ERCs & Offsets	
					Total Pounds	Total Tons
Required NOx	106,950	106,950	106,950	106,950	427,800	213.9
Required VOC	69,300	69,300	69,300	69,300	277,200	138.6
Required PM10	66,000	66,000	66,000	66,000	264,000	132.0
These ERCs have not been discounted to reflect the appropriate offset distance ration calculations						

Appendix P

National Marine Fisheries Service Biological Opinion on Sutter Power Project; Dated March 7, 1999

Sierra Nevada Customer Service Region

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
777 Sonoma Avenue, Room 325
Santa Rosa, California 95404

March 7, 1999 F/SWR4:SXE

Ms. Loreen McMahon
Environmental Project Manager
Department of Energy
Western Area Power Administration
114 Parkshore Drive
Folsom, CA 95630

Dear Ms. McMahon:

This concerns your request for consultation under sections 7 (a)(2) of the Endangered Species Act (ESA) and its implementing regulations, (50 CFR Part 402) on the Sutter Power Plant Project in Sutter County, California. By letter date June 9, 1998, and attached biological assessment, you notified the National Marine Fisheries Service (NMFS) of your determination that the Sutter Power Plant Project (proposed project) may affect endangered and threatened species under NMFS jurisdiction and requested formal consultation under section 7(a)(2) of the ESA. However, by letter dated October 7, 1998, and attached *Final Staff Assessment/Draft Environmental Impact Statement* for the Sutter Power Project, you notified NMFS that the design of the proposed project had been modified to preclude impacts to aquatic resources. Based upon these changes, you now determine that the proposed project is not likely to adversely affect any listed species under NMFS jurisdiction. This letter constitutes informal consultation.

Background

The following species and designated critical habitat are likely to occur in the vicinity of the proposed project and were considered in this consultation:

Chinook Salmon comprising the Sacramento River Winter-run Chinook Salmon - Evolutionarily Significant Unit (ESU) are listed as endangered (59 Fed. Reg. 440, January 4, 1994) under the ESA. Critical habitat for winter-run chinook was designated on June 16, 1993 (58 Fed. Reg. 33212).

Steelhead Trout (*Onchorynchus mykiss*) comprising the Central Valley ESU are listed as threatened (63 Fed. Reg. 13347, March 19, 1998) under the ESA. Critical Habitat was proposed for the Central Valley steelhead on February 5, 1999 (64 Fed. Reg. 5740).

In addition, Central Valley spring, fall and late/fall run chinook are proposed for listing and are likely to occur in the vicinity of the proposed project and were considered in this consultation.

The NMFS reviewed the following information during this consultation: 1) *Final Staff Assessment/Draft Environmental Impact Statement* for the Sutter Power Project. October 1998; 2) *Biological Assessment, Sutter Power Plant Project Sutter County, California.* April 1988; and 3) *Water Quality Control Plan for the California Regional Water Quality Control Board, Central Valley Region.* 1994.

The proposed project consists of a proposal by the Calpine Corporation (applicant) to construct and operate the Sutter Power Plant Project, a 500 megawatt (MW) natural gas fueled, combined cycle, electric generation facility. The proposed project would be located adjacent to Calpine's existing Greenleaf Unit 1, a 49 MW natural gas fueled cogeneration power plant. The project site is located approximately 7 miles southwest of Yuba City, on South Township Road near the intersection with Best Road. The land dedicated for the facility will comprise approximately 16 acres of Calpine's existing 77-acre parcel.

Additional project facilities include a 5.7 mile, 230 kilovolt (kV), overhead electric transmission line that would be built from the plant to a new switching station and a new 14.9 mile natural gas pipeline that will be constructed to provide fuel for the project. The 16 inch gas pipeline will connect to Pacific Gas and Electric's (PG&E) Line 302, an interstate natural gas supply line located to the west of the proposed project site, in Sutter County. Pursuant to its authorities under section 302 of the Department of Energy Organization Act, the Western Area Power Authority (WAPA) is the lead federal agency for the purposes of compliance with section 7(a)(2) of the ESA.

The original project design involved the discharge of wastewater to Sutter bypass. Under the original design the chemical and physical characteristics of the wastewater could exceed water quality standards and impact aquatic resources. To address concerns regarding wastewater discharge, the applicant redesigned the proposed project to eliminate effluent discharge from the facility. Use of dry cooling technology removes the need to dispose of cooling tower blowdown, which represented the major portion of the wastewater discharge stream. Remaining wastewater flows, including boiler blowdown and sanitary waste from the package sewage treatment plant also will not be disposed of as originally proposed. These flows, including wastewater from the oil/water separator, filter backwash, HRSG blowdown, sanitary wastes from the evaporative cooler blowdown, will be directed to a waste treatment basin. After treatment to remove suspended solids, this water can be recycled.

Conclusion

The potential for the proposed project to result in direct and indirect adverse effects to listed or proposed species under NMFS jurisdiction is negligible. Accordingly, based on available information, NMFS concurs with the determination of WAPA that the proposed project is not likely to adversely affect the endangered Sacramento River Winter-run chinook salmon, its critical habitat or the threatened Central Valley steelhead. Further, NMFS determines that the proposed project is not likely to adversely affect Central Valley spring, fall and late/fall run chinook or Central Valley steelhead critical habitat, which are proposed for listing under the ESA. The NMFS concurence is based upon: 1) the redesign of the proposed project to completely exclude the discharge wastewater; and 2) the negligible potential for the proposed actions to disturb listed species or adversely affect listed species or listed species habitat.

This concludes consultation and conferencing on these actions in accordance with 50 CFR 402.14(b)(1). The WAPA must reinitiate this consultation if new information becomes available or circumstances occur that may affect listed species or their critical habitat in a manner or to an extent not previously considered, or a new species is listed or critical habitat is designated that may be affected by the proposed actions.

Thank you for your cooperation in the above. If you have any questions regarding these comments, please contact Steve Edmondson at (707)575-6080.

Sincerely,

William T. Hogarth, Ph.D.
Regional Administrator

cc: James H. Lecky, NMFS

Appendix Q

California ISO Letter to Western Area Power Administration on Calpine Corporation and Proposed Sutter Power Plant; Dated March 8, 1999

Sierra Nevada Customer Service Region

CALIFORNIA ISO

California Independent
System Operator

March 8, 1999

Mr. Jerry Toenyes
Regional Manager
Western Area Power Administration
Sierra Nevada Region
114 Parkshore Drive
Folsom, CA 95630-4710

Re: *Calpine Corporation and Proposed Sutter Power Plant Project*

Dear Mr. Toenyes:

In February 1997, Calpine Corporation announced its plan to construct a nominal 525-megawatt merchant power plant in Sutter County. Subsequently, Calpine made a request to your office for a feasibility study. Your staff, in conjunction with the Sacramento Area Transmission Planning Group (SATPG), has performed the feasibility study that concluded that interconnecting the proposed Sutter Power Plant Project (SPPP) with your Keswick-Elverta and Olinda-Elverta 230-kilovolt lines is a feasible integration alternative. Calpine has filed an Application for Certification (AFC) and expects approval soon from the California Energy Commission (CEC) to construct and operate the SPPP.

Our evaluation of the studies conducted to date by Western, SATPG, and CEC staff confirms the need for new power plants such as SPPP in the Sacramento Valley. The reliability studies SATPG has done to date clearly conclude that the SPPP will alleviate the voltage security concerns in the greater Sacramento area, at least for a few years.

When a generator plans to locate in an area where they are needed, we should do all that we can to facilitate their interconnection to the grid. We urge you to advance the SPPP interconnection by expediting the necessary agreement with Calpine. Resources near the load centers will go a long way in eliminating the risk for a system-wide collapse and defer the need for new transmission lines.

Please call me at (916) 351-2366 if you have any questions or if we can be any further assistance.

Sincerely,

Terry M. Winter

Terry M. Winter
President and Chief Executive Officer

cc: Morteza Sabet, Western Area Power Association
Kellan Fluckiger, California ISO
Armando J. Perez, California ISO

Appendix R

Native American Contacts and Contact Letters (Dated March 24, 1998) from the Cultural Resources Inventory of the Sutter Power Project, Sutter County, California by Douglas M. Davy, Ph.D. and Jennifer K.D. Nachmanoff; Dated January 1999

Sierra Nevada Customer Service Region

Native American Contacts

Ms. April Moore
19630 Placer Hills Road
Colfax, CA 95713

Ms. Beryle Cross
2329 Via Laton
Oroville, CA 95966

Hickey J. Murray
P.O. Box 116
Newcastle, CA 95658

Ms. Jill Harvey
Box 11799 McCourtney Road
Grass Valley, CA 95945

Mr. Joe Marine
1720 N Street, #22
Sacramento, CA 95814

Ms. Rose Enos
15310 Bancroft Road
Auburn, CA 95603

Mr. Sam Starkey
953 Indian Rancheria Road
Auburn, CA 95603

Mr. Albert Martin, Chairperson
Berry Creek Rancheria of Maidu Indians
#5 Tyme Way
Oroville, CA 95966

Ms. Jewel Pavalunas
Butte Tribal Council
3300 Spencer Ave.
Oroville, CA 95966

Mr. James Marquez, Chairperson
El Dorado County Indian Council
P.O. Box 564
El Dorado, CA 95623

Mr. Art Angle, Chairperson
Enterprise Rancheria of Maidu Indians
2950 Feather River
Oroville, CA 95965

Ms. Martha Noel
Maidu Elders Organization
P.O. Box 206
Dobbins, CA 95935

Ms. Clara LeCompte
Maidu Nation
P.O. Box 204
Susanville, CA 96130

Mr. Guy Taylor
Mooretown Rancheria of Maidu Indians
#1 Alverda Drive
Oroville, CA 95966

Mr. W. David Murray, Sr., Chairperson
Shingle Springs Band of Miwok Indians
P.O. Box 1340
Shingle Springs, CA 95682

Ms. Jessica Tavares
United Auburn Indian Community
661 Newcastle Road, Suite 1
Newcastle, CA 95658

FOSTER WHEELER
FOSTER WHEELER ENVIRONMENTAL CORPORATION

March 24, 1998
FWSO-Calpine/SPP-____

April Moore
19630 Placer Hills Road
Colfax, California 95713

Dear Ms. Moore:

Calpine Corporation (Calpine) proposes to construct a natural gas-fired power plant referred to as the Sutter Power Plant. The proposed location for the facility is on a portion of a 77-acre property owned by Calpine in Sutter County, south of the Sutter Buttes, east of the Sutter Bypass and west of the Feather River. Calpine presently operates a 49.5-megawatt cogeneration plant at this location. The attached maps show the location of the proposed plant site, along with routes being considered for an associated natural gas line and electrical transmission line.

The California Energy Commission (CEC) is responsible for permitting the proposed project. Calpine filed an Application for Certification (AFC) with the CEC on December 15, 1997 and the CEC accepted the AFC as complete on January 21, 1998, initiating a 1-year review process. The CEC and the Western Area Power Administration will direct environmental review and public scoping processes over the next 12 months.

The Native American Heritage Commission provided Calpine with your name and address as someone who may have knowledge of heritage lands or other resources of interest that the project would potentially affect. The enclosed form is provided to help Calpine identify and address your concerns. Return of this form does not imply that you approve or disapprove of the permit issuance or of the above mentioned project, nor does it limit your opportunity to comment at a later time.

If you have any questions or comments regarding the proposed Sutter Power Plant project, please contact _____ at _____.

Sincerely,

Charlene West

Calpine Corporation

Enclosure: Response Form

c: Doug Davy, Foster Wheeler Environmental
Dave Augustine, Foster Wheeler Environmental
Project File

3927 LENNANE DRIVE, SUITE 200, SACRAMENTO, CALIFORNIA 95834-1957
TEL: 916-928-0202 FAX: 916-928-0594

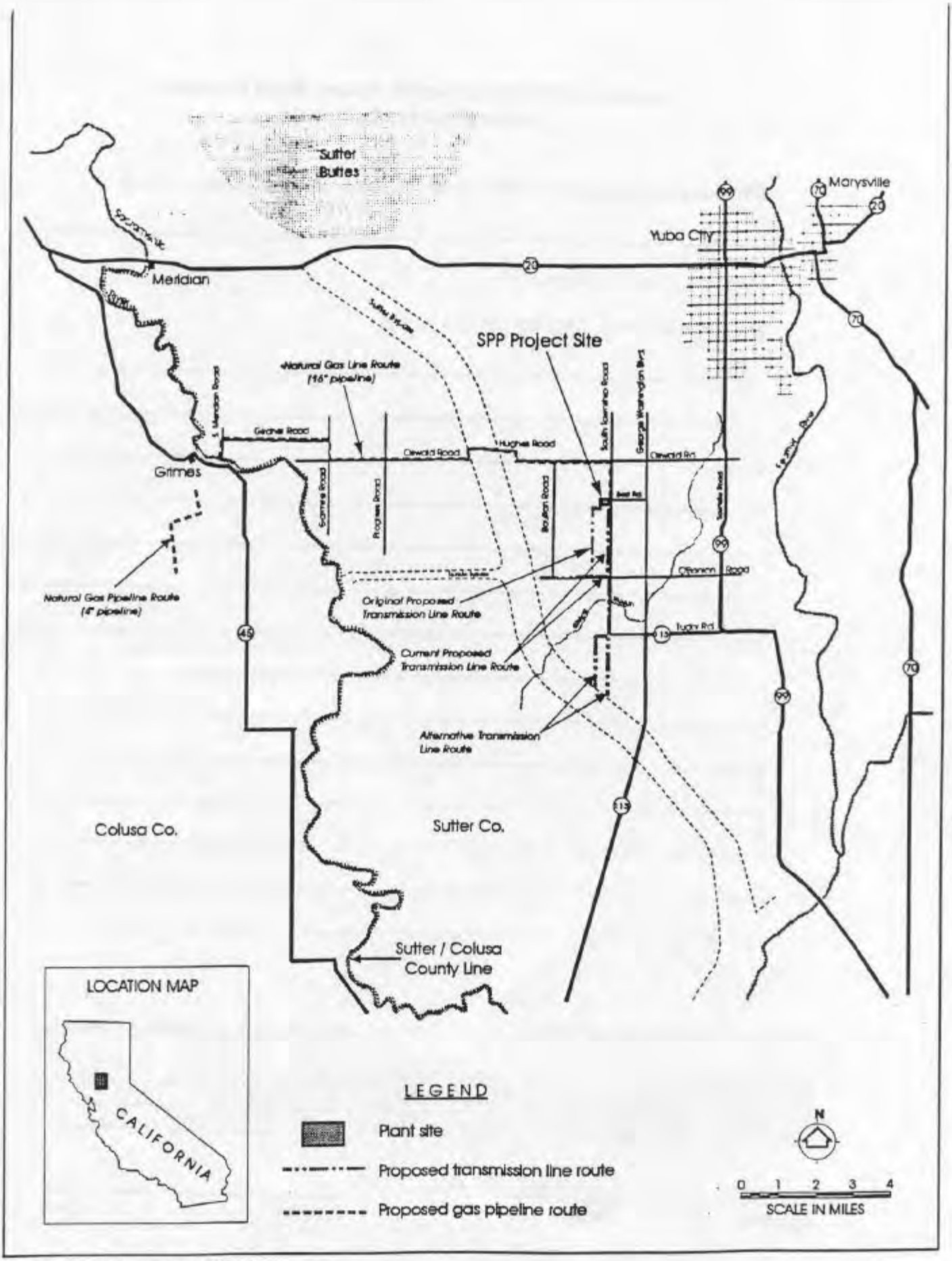


Figure 1. SPP project vicinity.

Calpine Corporation Sutter Power Plant Proposal
Sutter County, California

___ I/We have concerns and would like to be contacted. You can contact me/us at:

_____.

___ I/We do not have concerns.

___ I/We have concerns. They are outlined below:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

CONTACT LETTER MAILED TO:

April Moore
19630 Placer Hills Road
Colfax, California 95713

NAME AND ADDRESS (if different)

_____
_____
_____

_____ _____

Signature Date Signature Date

Please return completed form in the stamped and addressed envelope enclosed. Thank you.

Appendix S

Easement Restriction for Sutter National Wildlife Refuge; Dated Feb. 17, 1999

Sierra Nevada Customer Service Region

IN REPLY REFER TO:

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Sacramento National Wildlife Refuge Complex
752 County Road 99W, Willows, California 95988
(530) 934-2801
February 17, 1999

Gary Fay, Hearing Manager
California Energy Commission
1516 Ninth Street, MS 9
Sacramento, CA 95814

Dear Mr. Fay:

I am writing in regard to the Calpine Corporation's proposed 16-inch gas pipeline through Sutter National Wildlife Refuge (Refuge). We have reviewed the easement document for the existing eight-inch pipeline through the Refuge along Hughes Road, that is now held by Pacific Gas and Electric Company (attached). However, we have not reviewed any specific engineering plans for the proposed 16-inch line. Apparently PG&E has considered obtaining an additional easement adjacent to and south of the existing easement to accommodate the new pipeline. Easements cannot be granted at the Refuge level, and any pursuit of additional easements through Refuge property requires contact with our Regional Office in Portland, Oregon. Based on our review, we feel that the conditions of the existing easement allow for work within the designated 15-foot corridor, and we hereby give the permission to work within that corridor *only*, with the following conditions.

1. Any work complies with all the terms and conditions of the easement document, including any special stipulations included in this letter (pursuant to Exhibit "A," section (b) of the Terms and Conditions section of the easement document).

2. The project complies with all state, federal, and county laws and regulations, including environmental documentation, primarily NEPA and CEQA.

3. Any additional width required for work space be accommodated by using Hughes Road itself, including the shoulders if necessary. Although the easement document held by PG&E identifies the easement width as 15 feet, Calpine's proposed construction methods indicate a need for additional width, up to 35 more feet to provide work space (Calpine Final AFC, section 7-3, page 7-4). This may require that additional easements be obtained from Sutter County.

4. The work is scheduled for the period of time between July 15 and September 1. This time frame represents the dates by which the Refuge's summer wetlands are drawn down and fall wetland flooding is initiated according to our habitat management plan. We would like to avoid disturbance to breeding wildlife before July 15 and to large numbers of wintering waterfowl that begin arriving in September.

5. The project engineers locate the new pipeline under Hughes Road as a first priority.

6. It has come to our attention that the 15-foot wide existing easement may not *safely* accommodate the excavation work to place the proposed 16-inch line parallel to the existing eight-inch pipeline. Any plans or work to accommodate both pipelines within the existing easement must comply with pipeline safety requirements as identified in Exhibit B-Terms and Conditions for "Rights-of-way for Pipelines for the Transportation of Oil, Natural Gas, Synthetic Liquid or Gaseous Fuels, or Any Refined Product Produced Therefrom" section of the easement document.

7. We recently initiated an effort to upgrade the "Main Canal" at the Refuge, which bisects the existing pipeline and proposed upgrade within the Sutter Bypass (see figure attached). Please note that this canal is separate from the larger bypass canals, which are located just inside the bypass levees. We are in the process of contracting the engineering work for the main canal upgrade and expect the actual work to take place during the summer of the year 2000. Therefore, pipeline project engineers will be required to coordinate with refuge managers and consulting engineers on the canal project to ensure that the pipeline project will accommodate any proposed upgrade work on the main canal. Any modifications required to accommodate the two projects must consider the Refuge's needs as a priority, and any needs for the pipeline secondarily. The pipeline project will be required to accommodate any dimension modifications or water control structures required for the canal, including any conveyance structures under Hughes Road. The pipeline engineers will also coordinate the timing of the project with refuge staff and their consulting engineers.

8. Reasonable access must be maintained for refuge staff, mosquito abatement personnel, and other authorized personnel in portions of the Refuge both north and south of the project area.

9. Because we were unable to obtain engineering designs for the pipeline and installation from PG&E in time to include in this letter, we reserve the right to specify additional stipulations upon review of those designs.

Please notify Mike Wolder of my staff at the above number if there are any further questions regarding this matter.

Sincerely,

Gary W. Kramer
Refuge Manager

Attachment

cc: Linda Spiegel, CEC
Charlene Wardlow, Calpine Corporation
Kelly Hornaday, USFWS Sacramento Field Office
Scott Wilson, PG&E

EXHIBIT "A"

EASEMENT
FOR
RIGHT-OF-WAY

THE SECRETARY OF THE INTERIOR, by his authorized representative, the Regional Director, U.S. Fish and Wildlife Service, in accordance with Title 50 of the Code of Federal Regulations, Part 29, Subpart B, hereby grants to the Greenleaf Unit One Associates, a California limited partnership, ~~a corporation of the State of California,~~ herein designated as the Grantee, an easement for a buried natural-gas pipeline, for a period of 30 years, over, across, in and upon land of the United States described as follows:

An easement in Sutter County, California, being a portion of Section 9, T. 14 N., R. 2 E., M.D.B.M., more particularly described as follows:

A strip of land 15.00 feet wide, the centerline of said strip being described as follows:

Beginning at a point in the east line of that certain parcel of land conveyed to the United States of America by Grant Davis and Emma F. Davis by deed recorded in Book 308, Page 486, Official Records of Sutter County, said point being South 89°43'31" East, 2408.94 feet, from a brass monument stamped Sutter County Department of Public Works marking the northeast corner of the southeast quarter of the southwest quarter of said Section 9; thence South 81°54'54" West, 102.94 feet; thence North 88°24'10" West, 451.08 feet; thence South 89°06'25" West, 435.11 feet; thence North 88°47'09" West, 1281.81 feet; thence through a curve to the left with a radius of 2000.00 feet and a central angle of 09°31'26" an arc distance of 332.45 feet; thence South 81°41'25" West, 810.98 feet; thence South 85°33'04" West, 163.82 feet to a point in the west line of that certain parcel of land designated Tract No. 2b in a judgement recorded in Book 217, Page 309, Official Records of Sutter County, said point being South 82°55'57" West, 1166.58 feet from said Sutter County Department of Public Works brass monument, and said point being the terminus of said centerline.

(Basis of Bearings for the above description is the California Coordinate System, Zone II, originating at N.G.S. Station "Hunt".)

By accepting this easement, the Grantee agrees to those portions of Part 29, Subpart B of Title 50 of the Code of Federal Regulations which are attached hereto as Exhibits A and B and made a part hereof.

IN WITNESS WHEREOF, I have hereunto set my hand this 2nd day of January, 1986.

THE UNITED STATES OF AMERICA

Regional Director
U.S. Fish and Wildlife Service

EXHIBIT "A"

ACKNOWLEDGMENT

STATE OF Oregon }
County of Multnomah } ss

On this 2nd day of January, in the year 1986, before me personally appeared Richard J. Nyshak, Regional Director, known to me to be the person described in and who executed the foregoing instrument and acknowledged to me he executed the same as his free act and deed.

Carol L. Williams
Notary Public in and for the State of Oregon residing at Portland
My Commission Expires: 05/05/88

The above instrument, together with all terms and conditions thereof, is hereby accepted this 24th day of December, 1985.

Greenleaf Unit One Associates,
a California limited partnership

By: [signature] (Title) Project Manager

13356 2114-02-0182

2000-1026 Greenleaf Cogeneration B/L
3 88 1 (SV 4.00)
AFTER RECORDING, RETURN TO:

Indexed

13356

FOR RECORDER'S USE ONLY
OFFICIAL RECORDS
SUTTER COUNTY, CA.
REQUESTED BY
PACIFIC GAS & ELECTRIC CO.
'88 SEP 8 AM 8 48

LORNA D. SMITH
COUNTY RECORDER
BOOK 270 PAGE 28 FEE $5.00

Compared

PACIFIC GAS AND ELECTRIC COMPANY
77 Beale St. Land Dept. Rm [illegible]
San Francisco, California [illegible]

Location: City/Unins: _____

Recording Fee $5.00

Documentary Transfer Tax $ None

☐ Computed on Full Value of Property Conveyed, or
☐ Computed on Full Value Less Liens & Encumbrances
Remaining at Time of Sale

Maurice Ellendunn
Signature of declarant or agent determining tax

ASSIGNMENT OF EASEMENT (NO CONSIDERATION)

GREENLEAF UNIT ONE ASSOCIATES, a California limited partnership, hereinafter called Greenleaf, hereby assigns to PACIFIC GAS AND ELECTRIC COMPANY, a California corporation, hereinafter called Pacific, all of Greenleaf's right, title and interest in and under the easement and right of way for a natural gas pipeline granted by The Secretary of the Interior and described in EXHIBIT "A" attached hereto and made a part hereof.

3/31/88
T.E. Hunt
Gas Op. Mgr.

Pacific agrees to comply with and be bound by the terms and conditions as described in said EXHIBIT "A".

IN WITNESS WHEREOF Greenleaf has executed these presents this 25, day of May, 1988.

GREENLEAF UNIT ONE ASSOCIATES
By: GREENLEAF UNIT ONE ASSOCIATES, INC.
By: General Partner James W. Porter Jr.
James W. Porter, Jr. Vice Pres.

Accepted and agreed to this 1st day of June, 1988.

PACIFIC GAS AND ELECTRIC COMPANY

By: _____
M. R. Amerio
Regional General Services Manager

SACRAMENTO VALLEY REGION
COLGATE DIVISION
GM 4659298
T14N, R2E, M.D.B.& M.
Sec.9
SE4
E2 of SW4
BB-806
APN 21-140-08, 09, 11, 14, 15
Prepared by: MJH
Checked by: _____

PGandE'S COPY - PLEASE RETURN

BOOK 1270 PAGE 028

COMMONWEALTH OF PENNSYLVANIA)
)ss.
COUNTY OF DELAWARE)

On this 25th day of May in the year 1988, before me personally appeared James W. Porter, Jr., known to me as the person described in and who executed the foregoing instrument and acknowledged to me he executed the same as his free act and deed.

Nancy L. Jillson
Notary Public

NANCY L. JILLSON, Notary Public
Ridley, Delaware County
My Commission Expires June 4, 1991

SEAL

82-4302 (Corporation) Rev. 1/83

STATE OF CALIFORNIA
County of Sacramento } ss.

On this 2nd day of June in the year 1988 before me, Cynthia L. Ambrose
a Notary Public for the State of California, personally appeared M. P. Amerio
personally known to me (or proved to me on the basis of satisfactory evidence to be the person(s) who executed the within instrument as Regional General Services Manager, on behalf of Pacific Gas & Electric Company,
a corporation, and acknowledged to me that the corporation executed it pursuant to its by-laws or a resolution of its board of directors.

Official Seal

OFFICIAL SEAL
CYNTHIA L. AMBROSE
NOTARY PUBLIC CALIFORNIA
SACRAMENTO COUNTY
MY COMMISSION EXPIRES NOV. 19,1991

Cynthia L. Ambrose
Notary Public for the State of California

BOOK 1270 PAGE 029

EXHIBIT "A"

EXHIBIT "A"

TERMS AND CONDITIONS

(a) Any right-of-way easement or permit granted will be subject to outstanding rights, if any, in third parties.

(b) An applicant, by accepting an easement or permit agrees to such terms and conditions as may be prescribed by the Regional Director in the granting document. Such terms and conditions shall include the following, unless waived in part by the Regional Director, and may include additional special stipulations at his discretion.

(1) To comply with State and Federal laws applicable to the project within which the easement or permit is granted, and to the lands which are included in the easement or permit area, and lawful existing regulations thereunder.

(2) To clear and keep clear the lands within the easement or permit area to the extent and in the manner directed by the project manager in charge; and to dispose of all vegetative and other material cut, uprooted, or otherwise accumulated during the construction and maintenance of the project in such manner as to decrease the fire hazard and also in accordance with such instructions as the project manager may specify.

(3) To prevent the disturbance or removal of any public land survey monument or project boundary monument unless and until the applicant has requested and received from the Regional Director approval of measures the applicant will take to perpetuate the location of aforesaid monument.

(4) To take such soil and resource conservation and protection measures, including weed control on the land covered by the easement or permit as the project manager in charge may request.

(5) To do everything reasonably within his power, both independently and on request of any duly authorized representative of the United States, to prevent and suppress fires on or near lands to be occupied under the easement or permit area, including making available such construction and maintenance forces as may be reasonable obtainable for the suppression of such fires.

(6) To rebuild and repair such roads, fences, structures, and trails as may be destroyed or injured by construction work and, upon request by the Regional Director, to build and maintain necessary and suitable crossings for all roads and trails that intersect the works constructed, maintained, or operated under the easement or permit.

EXHIBIT "A"

(7) To pay the United States the full value for all damages to the lands or other property of the United States caused by him or his employees, contractors, or agents of the contractors, and to indemnify the United States against any liability for damages to life, person, or property arising from the occupancy or use of the lands under the easement or permit, except where the easement or permit is granted hereunder to a State or other governmental agency which has no legal power to assume such a liability with respect to damages caused by it to lands or property, such agency in lieu thereof agrees to repair all such damages. Where the easement of permit involves lands which are under the exclusive jurisdiction of the United States, the holder or his employees, contractors, or agents of the contractors, shall be liable to third parties for injuries incurred in connecton with the easement or permit area. Grants of easements or permits involving special hazards will impose liability without fault for injury and damage to the land and property of the United States up to a specified maximum limit commensurate with the foreseeable risks or hazards presented. The amount of no-fault liability for each occurrence is hereby limited to no more than $1,000,000.00.

(8) To notify promptly the project manager in charge of the amount of merchantable timber, if any, which will be cut, removed, or destroyed in the construction and maintenance of the project, and to pay the United States in advance of construction such sum of money as the project manager may determine to be the full stumpage value of the timber to be so cut, removed, or destroyed.

(9) That all or any part of the easement or permit granted may be suspended or terminated by the Regional Director for failure to comply with any or all terms and conditions of the grant, or for abandonment. A rebuttable presumption of abandonment is raised by deliberate failure of the holder to use for any continuous 2-year period the easement or permit for the purpose for which it was granted or renewed. In the event of noncompliance or abandonment, the Regional Director will notify in writing the holder of the easement or permit of his intention to suspend or terminate such grant 60 days from the date of the notice, stating the reasons therefore, unless prior to that time the holder completes such corrective actions as are specified in the notice. The Regional Director may grant an extension of time within which to complete corrective actions when, in his judgment, extenuating circumstances not within the holder's control such as adverse weather conditions, disturbance to wildlife during breeding periods or periods of peak concentration, or other compelling reasons warrant. Should the holder of a right-of-way issued under authority of the Mineral Leasing Act, as amended, fail to take corrective action within the 60-day period, the Regional Director will provide for an administrative proceeding pursuant to 5 U.S.C. 554, prior to a final Departmental decision to suspend or terminate the easement or permit. In the case of all other right-of-way holders, failure to take corrective action within the 60-day period will result in a determination by the Regional Director to suspend or terminate the easement or permit. No administrative proceeding shall be required where the easement or permit terminates under its terms.

EXHIBIT "A"

(10) To restore the land to its original condition to the satisfaction of the Regional Director so far as it is reasonably possible to do so upon revocation and/or termination of the easement or permit, unless this requirement is waived in writing by the Regional Director. Termination also includes permits or easements that terminate under the terms of the grant.

(11) To keep the project manager informed at all times of his address, and, in case of corporations, of the address of its principal place of business and the names and addresses of its principal officers.

(12) That in the construction, operation, and maintenance of the project, he shall not discriminate against any employee or applicant for employment because of race, creed, color, or national origin and shall require an identical provision to be included in all subcontracts.

(13) That the grant of the easement or permit shall be subject to the express condition that the exercise thereof will not unduly interfere with the management, administration, or disposal by the United States of the land affected thereby. The applicant agrees and consents to the occupancy and use by the United States, its grantees, permittees, or lessees of any part of the easement or permit area not actually occupied for the purpose of the granted rights to the extent that it does not interfere with the full and safe utilization thereof by the holder. The holder of an easement or permit also agrees that authorized representatives of the United States shall have the right of access to the easement or permit area for the purpose of making inspections and monitoring the construction, operation and maintenance of facilities.

(14) That the easement or permit herein granted shall be subject to the express covenant that any facility constructed thereon will be modified or adapted, if such is found by the Regional Director to be necessary, without liability or expense to the United States, so that such facility will not conflict with the use and occupancy of the land for any authorized works which may hereafter be constructed thereon under the authority of the United States. Any such modification will be planned and scheduled so as not to interfere unduly with or to have minimal effect upon continuity of energy and delivery requirements.

(15) That the easement or permit herein granted shall be for the specific use described and may not be construed to include the further right to authorize any other use within the easement or permit area unless approved in writing by the Regional Director.

EXHIBIT "A"

CONSTRUCTION

(a) If construction is not commenced within two (2) years after date of right-of-way grant, the right-of-way may be cancelled by the Director of the U.S. Fish and Wildlife Service at his discretion.

(b) Proof of construction: Upon completion of construction, the applicant shall file a certification of completion with the Regional Director.

EXHIBIT "A"

DISPOSAL, TRANSFER OR TERMINATION OF INTEREST

(a) Change in jurisdiction over and disposal of lands. The final disposal by the United States of any tract of land traversed by a right-of-way shall not be construed to be a revocation of the right-of-way in whole or in part, but such final disposition shall be deemed and taken to be subject to such right-of-way unless it has been specifically cancelled.

(b) Transfer of easement or permit. Any proposed transfer, by assignment, lease, operating agreement, or otherwise, of an easement or permit must be filed in triplicate with the Regional Director and must be supported by a stipulation that the transferee agrees to comply with and be bound by the terms and conditions of the original grant. A $25 nonreturnable service fee must accompany the proposal. No transfer will be recognized unless and until approved in writing by the Regional Director.

(c) Disposal of property on termination of right-of-way. In the absence of any agreement to the contrary, the holder of the right-of-way will be allowed 6 months after termination to remove all property or improvements other than a road and usable improvements to a road, placed thereon by him; otherwise, all such property and improvements shall become the property of the United States. Extensions of time may be granted at the discretion of the Regional Director.

EXHIBIT "A"

EXHIBIT B

TERMS AND CONDITIONS

for

RIGHTS-OF-WAY FOR PIPELINES FOR THE TRANSPORTATION OF OIL, NATURAL GAS, SYNTHETIC LIQUID OR GASEOUS FUELS, OR ANY REFINED PRODUCT PRODUCED THEREFROM (Reference Mineral Leasing Act of 1920/sec.28, as amended, CFR 29.21-9 and USFWS Manual 5REM 4.14 E)

(1) Pipeline Safety. To protect the safety of workers and the public from sudden ruptures and slow degradation of the pipeline. All facilities will be designed, constructed and operated in accordance with the provisions of Parts 192 and/or 195 of Title 49 of the Code of Federal Regulations and in accordance with the Occupational Safety and Health Act of 1970, Public Law 91-596, including any amendments thereto.

(2) Environmental Protection. To restore, revegetate, and curtail erosion of the surface; to ensure that activities in connection with the right-of-way or permit will not violate applicable air and water quality standards in related facilities siting standards established by law; to control or prevent damage to the environment including damage to fish and wildlife habitat, public or private property, and public health and safety; and to protect the interests of individuals living in the general area of the right-of-way or permit who who rely on the fish, wildlife, and biotic resources of the area for subsistence purposes.

(3) Suspension of Right-of-Way. The holder of this grant or permit is subject to an immediate temporary suspension of activities within a right-of-wny or permit area as necessary to protect public health and safety and the environment, prior to a formal administrative proceeding. Suspension would be lifted when the emergency condition is alleviated.

(4) Joint Use of Rights-of-Way. Additional rights-of-way or permits may be granted by the Regional Director for compatible uses on or adjacent to rights-of-way or permit areas granted after giving notice to the holder and an opportunity to comment.

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EXHIBIT "A"

LA-California
(P1) Sutter NWR
Greenleaf Unit One
Associates/Greenleaf
Power Corporation

CERTIFICATION OF COMPLETION OF CONSTRUCTION

I, _____, certify that I am the
(Name of Official)
_____ of the Greenleaf Unit One Associates/Greenleaf
(Title)
Power Corporation; that the right-of-way for a buried natural gas pipeline authorized by the Fish and Wildlife Service, was actually constructed; and that this organization has in all things complied with the stipulations of the right-of-way as granted.

_____ _____
(Date) (Signature)

_____
(Title)

Greenleaf Unit One Associates/Greenleaf
Power Corporation

PGandE'S COPY - PLEASE RETURN BOOK 1270 PAGE 038

THIS IS A TRUE COPY OF THE ORIGINA

ASSIGNMENT AND AMENDMENT
OF
EASEMENT FOR RIGHT-OF-WAY

The Secretary of the Interior, through his authorized representative, the Regional Director, United States Fish and Wildlife Service, in accordance with regulations published December 19, 1968, in 50 CFR 29.21, does hereby assign to Pacific Gas and Electric Company, a California corporation, that buried natural gas pipeline right-of-way issued to Greenleaf Unit One Associates, a California limited partnership, on January 2, 1985, across lands of the Sutter National Wildlife Refuge, a copy of said right-of-way being attached as Exhibit "A" and made a part hereto.

The legal description will be amended to include a minor realignment to accommodate a bridge reconstruction and the holder is hereby required to submit the amended survey descriptions.

In accepting this assignment, Pacific Gas and Electric Company agrees to comply with and be bound by all the terms and conditions of said right-of-way.

IN WITNESS WHEREOF, I have hereunto set my hand this 22nd day of JUNE, 19 88.

THE UNITED STATES OF AMERICA

Wally Steuche

ACTING Regional Director
U.S. FISH AND WILDLIFE SERVICE

The above instrument with all terms and conditions thereof, is hereby accepted this 4th day of August, 19 88.
Pacific Gas & Electric Company By M R Amerio Its Regional General Services Manager
M. R. Amerio

ACKNOWLEDGMENT

STATE OF OREGON)
)ss.
COUNTY OF MULTNOMAH)

On JUNE 22, 1988, before me personally appeared WALLY STEUCHE, ACTING ~~ROLF HALLENGREN~~, Regional Director, known to me to be the person described in and who executed the foregoing instrument and acknowledged to me he executed the same as his free act and deed.

Carol B. Williams
Notary Public in and for the State

of OREGON, residing

at PORTLAND OREGON.

My commission expires: 05/05/92.

Sutter NWR (P1)

CORPORATION ACKNOWLEDGEMENT

STATE OF CALIFORNIA)
)ss.
COUNTY OF Sacramento)

On August 4th, 19 88, before me, a Notary Public in and for said State, personally appeared M. R. Amerio and ....., personally known to me or proved to me on the basis of satisfactory evidence to be the persons who executed the within instrument as the Regional General Services Manager, and ....., respectively, of the Corporation that executed the within instrument and acknowledged to me that such corporation executed the within instrument pursuant to its by-laws or a resolution of its board of directors.

WITNESS my hand and official seal.

Cynthia L. Ambrose
(Signature)

OFFICIAL SEAL
CYNTHIA L. AMBROSE
NOTARY PUBLIC-CALIFORNIA
SACRAMENTO COUNTY
MY COMMISSION EXPIRES NOV. 19,1991

EXHIBIT A

EASEMENT
FOR
RIGHT-OF-WAY

THE SECRETARY OF THE INTERIOR, by his authorized representative, the Regional Director, U.S. Fish and Wildlife Service, in accordance with Title 50 of the Code of Federal Regulations, Part 29, Subpart B, hereby grants to the Greenleaf Unit One Associates, a California limited partnership, ~~a corporation of the State of California,~~ herein designated as the Grantee, an easement for a buried natural-gas pipeline, for a period of 30 years, over, across, in and upon land of the United States described as follows:

An easement in Sutter County, California, being a portion of Section 9, T. 14 N., R. 2 E., M.D.B.M., more particularly described as follows:

A strip of land 18.00 feet wide, the centerline of said strip being described as follows:

Beginning at a point in the east line of that certain parcel of land conveyed to the United States of America by Grant Davis and Emma F. Davis by deed recorded in Book 308, Page 486, Official Records of Sutter County, said point being South 89°43'31" East, 2408.94 feet, from a brass monument stamped Sutter County Department of Public Works marking the northeast corner of the southeast quarter of the southwest quarter of said Section 9; thence South 81°54'54" West, 102.94 feet; thence North 88°24'10" West, 451.08 feet; thence South 89°06'25" West, 435.11 feet; thence North 88°47'09" West, 1281.81 feet; thence through a curve to the left with a radius of 2000.00 feet and a central angle of 09°31'26" an arc distance of 332.45 feet; thence South 81°41'25" West, 810.98 feet; thence South 85°33'04" West, 163.82 feet to a point in the west line of that certain parcel of land designated Tract No. 2b in a judgement recorded in Book 217, Page 309, Official Records of Sutter County, said point being South 82°55'57" West, 1156.58 feet from said Sutter County Department of Public Works brass monument, and said point being the terminus of said centerline.

(Basis of Bearings for the above description is the California Coordinate System, Zone II, originating at N.G.S. Station "Hunt".)

By accepting this easement, the Grantee agrees to those portions of Part 29, Subpart B of Title 50 of the Code of Federal Regulations which are attached hereto as Exhibits A and B and made a part hereof.

IN WITNESS WHEREOF, I have hereunto set my hand this 2nd day of January, 1986.

THE UNITED STATES OF AMERICA

Regional Director
U.S. Fish and Wildlife Service

ACKNOWLEDGMENT

STATE OF OREGON)
County of MULTNOMAH) ss

On this 2nd day of JANUARY, in the year 1986, before me personally appeared RICHARD J. MYSHAK, Regional Director, known to me to be the person described in and who executed the foregoing instrument and acknowledged to me he executed the same as his free act and deed.

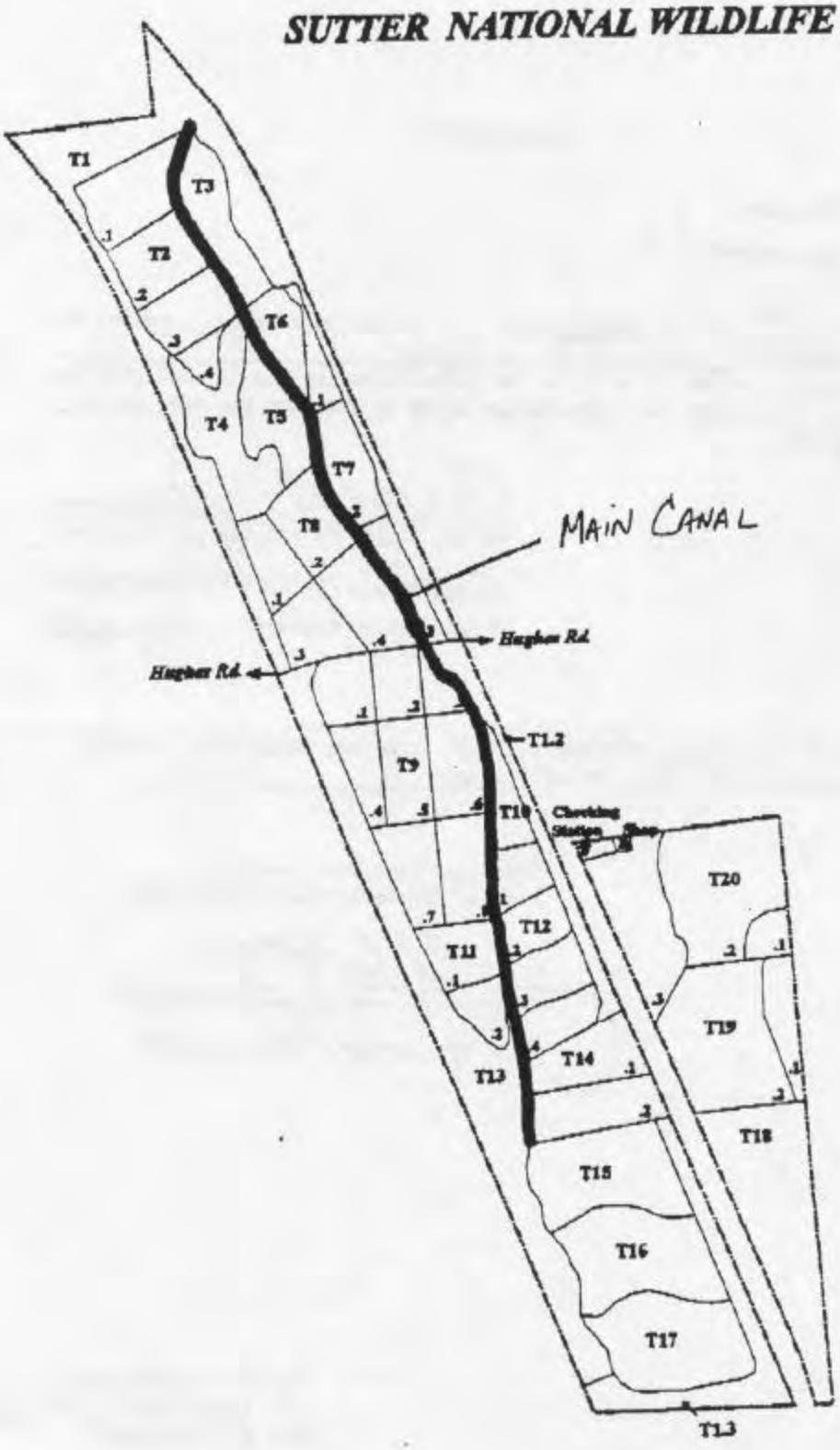
Carol B. Williams
Notary Public in and for the State of OREGON residing at PORTLAND
My Commission Expires: 05/05/88

The above instrument, together with all terms and conditions thereof, is hereby accepted this 24th day of December, 19 85.

Greenleaf Unit One Associates,
a California limited partnership

By: [signature] (Title) PROJECT MANAGER

SUTTER NATIONAL WILDLIFE REFUGE



Appendix T

U.S. Fish and Wildlife Service Biological Opinion on the Sutter Power Project; Dated April 2, 1999

Sierra Nevada Customer Service Region

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
3310 El Camino Avenue, Suite 130
Sacramento, California 95821-6340

IN REPLY REFER TO:
1-1-98-F-100

April 2, 1999

Ms. Loreen McMahon
Department of Energy
Western Area Power Administration
114 Parkshore Drive
Folsom, California 95630-4710

Subject: Formal Section 7 Consultation on the Calpine Corporation Sutter Power Plant Project, Sutter County, California

Dear Ms. Loreen McMahon:

This is in response to your April 22, 1998, letter initiating formal consultation with the U.S. Fish and Wildlife Service (Service) on the Calpine Corporation Sutter Power Plant (SPP) Project in Sutter County, California. Your request was received in our office on April 24, 1998. This document represents the Service's biological opinion on the effects of interconnection of the Sutter Power Plant Project with Western Area Power Administration's Keswick-Elverta and Olinda-Elverta 230-kilovolt (kV) transmission line on the threatened giant garter snake *(Thamnophis gigas)*, bald eagle (*Haliaeetus leucocephalus*), and Aleutian Canada goose (*Branta canadensis leucopareia*), and the endangered American peregrine falcon (*Falco peregrinus anatum*), in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*) (Act). The Service has determined that the SPP project is not likely to adversely affect Sacramento splittail (*Pogonichthys macrolepidotus*), vernal pool tadpole shrimp (*Lepidurus packardi*), vernal pool fairy shrimp (*Branchinecta lynchi*), Conservancy fairy shrimp (*Branchinecta conservatio*), Hartweg's golden sunburst (*Pseudobahia bahiifolia*), palmate-bracted bird's beak (*Cordylanthus palmatus*), or hairy orcutt grass (*Orcuttia pilosa*).

The findings and recommendations in this consultation are based on: (1) the Biological Assessment for the Sutter Power Plant Project, Sutter County, California, dated April 1998;

(2) the Preliminary Staff Assessment filed jointly by the California Energy Commission (CEC) and the Western Area Power Administration (WAPA), dated July 1998; (3) the Application for Certification for the Sutter Power Plant Project, submitted by Calpine Corporation to the California Energy Commission, dated December 15, 1997; (4) the Sutter Power Plant Effluent Water Quality Modeling Report, dated July 1998; (5) the Sutter Power Plant Effluent Water Temperature Modeling Report, dated July 1998; (6) the Final Staff Assessment/Draft Environmental Impact Statement filed jointly by the CEC and WAPA (the Final Staff Assessment serves as a joint NEPA/CEQA document), received October 30, 1998; and (6) additional oral and written communications between WAPA, CEC, Calpine, their consultants, and the Service. A complete administrative record of this consultation is on file at the Sacramento Fish and Wildlife Office.

Consultation History

The Service provided to WAPA on April 6, 1998, a list of species that may be present or may be affected by the proposed project. WAPA and Calpine provided assessments of the effects of the Sutter Power Plant Project for those listed species likely to occur in the project area. Seasonal wetlands were sampled for federally listed vernal pool crustaceans according to Service-approved protocols (PRT # 796012). The non-listed California linderiella (*Linderiella occidentalis*) and versatile fairy shrimp (*Branchinecta lindahli*) were found on site. The federally listed vernal pool tadpole shrimp, vernal pool fairy shrimp, and Conservancy fairy shrimp were not found during sampling. Botanical surveys were also conducted. California hibiscus (*Hibiscus lasiocarpus*) was detected along the pipeline route within the Sutter NWR, but no federally listed plant species were detected. Sacramento splittail have been documented in the Sutter Bypass and could potentially be affected by poor water quality resulting from power plant effluent discharge into the Sutter Bypass. Calpine's proposed conservation measure incorporating a drycooling system will eliminate effluent discharge and any potential water quality effects to the Sacramento splittail.

WAPA submitted a biological assessment and requested formal consultation on April 22, 1998. The request was received by the Service on April 24, 1998. The Service was aware that the CEC requested additional data on the proposed project's effects on water quality and anticipated receipt of this information by June 30, 1998. The Service reviewed the available water quality information and did not believe the new information would substantially change the analysis of the effects of the action. On June 8, 1998, the Service responded to WAPA's request for initiation of formal consultation with an acknowledgment of receipt of the information necessary to complete formal consultation. The Service also acknowledged that additional time may be required to evaluate the effects of the proposed project if the pending water quality modeling reports revealed the project may affect listed species in a manner or to an extent not previously considered.

The Service reviewed water quality modeling reports received in July of 1998. After review of the water quality modeling reports, the Service determined the additional information revealed that the effluent from the SPP could adversely affect giant garter snakes, Sacramento splittail, and

salmonids, and could increase the risk of avian botulism outbreaks at Sutter National Wildlife Refuge (NWR). Calpine subsequently modified the SPP design to incorporate a dry cooling system that would result in zero discharge. The Service received Calpine's "Mitigation Program Supplement to the Application for Certification for the Sutter Power Plant" on October 9, 1998, that provided new information on the proposed project change to a dry cooling system. Further project review by the CEC also resulted in a revised transmission line route and switchyard location. The Service has reviewed and analyzed the effects of the modified cooling system and subsequent project changes and has incorporated them into this biological opinion.

BIOLOGICAL OPINION

Description of the Proposed Action

WAPA operates and maintains an extensive, high-voltage transmission system to deliver reliable electric power to most of the western half of the United States. Calpine Corporation (Calpine) has requested interconnection with WAPA's Keswick-Elverta and Olinda-Elverta 230-kilovolt (kV) transmission line in association with construction of the Sutter Power Plant (SPP). Calpine's objective for developing the SPP is to sell power to a mix of wholesale and retail customers in the newly deregulated electricity market. Calpine intends to sell power on a short and mid-term basis to customers, and on the spot market. The Service acknowledges that SPP may have growth inducing effects within its service area. However, because of the SPP interconnection with WAPA's transmission system serving a large area, and Calpine's intention to sell electrical power on a short term basis, the location and extent of service area effects of the SPP cannot be determined. To the extent that action areas for future section 7 consultations will overlap with the service area of the SPP, the Service believes these potential indirect, service area effects will be addressed. For example, the Service expects to address many of these effects in future consultations on Central Valley Project (CVP) water contract renewals which will also address growth induced service area effects. To the extent that power from the SPP has service area effects beyond areas also served by CVP water, the location of those effects cannot be determined. For the purposes of this consultation, the action area for the SPP Project is considered to be the Colusa Basin and the Sutter Basin.

The Sutter Power Plant project consists of a 16-acre power plant, an associated 12.9 mile natural gas pipeline, a 4.0 mile transmission line, and a 2.2 acres switching station. The majority of the project is located in Sutter County within the Sutter Basin watershed, east of the Sutter Bypass. The natural gas pipeline route also crosses the Sutter Bypass to the east side of the Sacramento River. A portion of the pipeline route lies west of the Sacramento River within Colusa County and the Colusa Basin.

Power Plant

Site description - The proposed Sutter Power Plant Project is located in Sutter County approximately 36 miles northwest of Sacramento and 7 miles southwest of Yuba City. The project is located on 16 acres of Calpine's existing 77-acre parcel and will be located adjacent to Calpine's existing Greenleaf 1 cogeneration power plant. The facility is bordered on the east by South Township Road and by rice fields on the north, west, and south. Surrounding land use is primarily agriculture consisting of rice, field crops, and orchards. The site is located approximately 2 miles directly east of the Sutter Bypass and the Sutter National Wildlife Refuge (NWR). The Sutter NWR supports seasonal and permanent wetlands, riparian woodlands, and waterways used by anadromous fish and Sacramento splittail. Gilsizer Slough, which is protected by a conservation easement, is located 2 miles to the south. Gilsizer Slough supports emergent wetlands and a population of giant garter snakes. The site is also located within the Sutter Basin watershed and the Pacific Flyway for migratory waterfowl.

Current uses on the 77-acre parcel consist of the 12-acre Greenleaf 1 cogeneration plant, associated storage and office buildings, and roads. Wetlands on the parcel include vernal pools, borrow pits, abandoned mosquito abatement trenches, a perennial mosquito abatement pond, seasonal depressions, and a 6-foot wide canal on the south side of the property. Habitat types on the SPP site consist of 52.8 acres of disturbed annual grasslands, 8.7 acres of seasonal wetlands, 2.0 acres of drainage canals, and 1.2 acres of blackberry brambles. The drainage canals contain emergent wetland vegetation similar to natural waterways and support bullfrogs, crayfish, and mosquitofish. Agricultural drainage canals border the site on all four sides. The grasslands are mowed annually for fire control.

Power plant - The proposed Sutter Power Plant project will be constructed, owned, and operated by Calpine Corporation. Calpine proposes to build a 500 megawatt (MW) natural gas fueled merchant power plant. The proposed project will consist of gas combustion turbines, zero discharge dry cooling towers, two 145-foot tall heat recovery steam generator (HRSG) emission stacks, and asphalt parking lots. The project will require approximately 16 acres of Calpine's existing 77-acre parcel and will be located adjacent to Calpine's existing Greenleaf 1 cogeneration power plant. Access to the project site will be from South Township Road on the east side of the project site.

Water for the SPP will be provided by an on-site well system developed as part of the project. Originally, Calpine proposed using a water cooled system that would require 3,000 gallons of groundwater per minute. The water would circulate twice through the cooling system before being discharged as effluent via surface drainages to the Sutter Bypass. Approximately 1.9 million gallons per day of wastewater would have been discharged to the surrounding agricultural waterways. Calpine has proposed replacing this system with a dry cooling system, greatly reducing the use of groundwater and eliminating effluent discharge. Two 500 gallon per minute wells will be developed. One well will meet facility needs. The second well will provide a back

up. Sanitary waste will be treated by an onsite sewage treatment system. Incorporation of the dry cooling system will reduce groundwater use by 95% from the original proposal of 3000 gallons per minute to 140 gallons per minute. Maximum net ground water use is estimated at

318,000 gallons per day. With incorporation of a dry cooling system, operation of the plant will not result in discharge of effluent to existing surface drainages.

Construction of the SPP is scheduled to begin in the first quarter of 1999. Construction work will include clearing and grading the 16 acre site, bringing in fill material to build up the base of the facility, fencing the construction site, constructing the facility and cooling towers, and constructing and wiring the transmission lines at the site.

Natural Gas Pipeline

Site description - The natural gas pipeline route is located in Sutter and Colusa counties. The route will begin at the SPP, run north on South Township Road for approximately 5,900 feet, and then west to the east side of the Sacramento River across from the town of Grimes, ending with a dehydrator station. Approximately 5,500 feet of the pipeline will cross the Sutter NWR in the Sutter Bypass. The Sutter NWR contains seasonal wetlands, permanent wetlands, and riparian corridors. Outside the Sutter Bypass, the pipeline corridor parallels paved and dirt roads and agricultural fields. Approximately 6.5 miles of the pipeline parallel irrigation canals, which contain wetlands vegetation and prey species such as mosquito fish, carp, bullfrogs, and bullfrog and Pacific treefrog tadpoles.

Additional pipe will also be laid on the west side of the Sacramento River in Colusa County. West of the Sacramento River, approximately 8,000 feet of pipeline will be laid along Poundstone Road in Colusa County south of the town of Grimes. Valley oaks border portions of Poundstone Road. A new dehydrator station will be installed in Colusa County at PG&E's existing Poundstone drip station. The drip station is currently located within land used as pasture. Installation of the dehydrator will require an additional 5,000 square feet of pasture land. The surrounding land use is primarily field crops and pasture.

Natural Gas Pipeline - A new 14.9-mile natural gas pipeline will be constructed to provide fuel to the power plant. The 16-inch gas pipeline will connect to Pacific Gas and Electric's (PG&E) Line 302. The pipeline will run along an existing 13.4-mile gas pipeline that currently provides natural gas to Greenleaf 1. The pipeline will run north on South Township Road and then west along Oswald Road to the northeast side of the Sacramento River, ending with a dehydrator station. The Sacramento River drip station will be expanded by about 5,000 square feet. The pipeline will cross the Sutter Bypass and the Sutter NWR within the 100-foot wide Hughes Road county road easement. The existing dehydrator stations will be expanded to 5,000 square feet to replace an existing drip station. An 8,000-foot 4-inch diameter natural gas pipeline will also be constructed to upgrade the gas gathering system south of Grimes. Colusa County, California.

Construction of the natural gas pipeline is scheduled to begin in the summer of 2000, from May through October. Within the Sutter Bypass and Sutter NWR, construction of the pipeline will require a 25-foot wide construction corridor. The remainder of the pipeline will require a 50-foot wide construction corridor. Approximately 20 irrigation canals may be fitted with temporary culverts to provide continuous water flow. Trenches will be dug underneath the culverts to lay the pipeline. Five larger canals (20-foot wide or larger) will require boring, which will temporarily disturb 0.5 acre on either side of each canal, resulting in 5 acres of disturbance. The pipeline will be bored 30 feet underneath the east and west borrow channels of the Sutter Bypass. Approximately 80 percent of the pipeline will be placed within roadways underneath pavement or gravel. The remaining pipeline will be drilled underneath water channels and placed along the edges of roadways. The 50-foot construction corridor for the pipeline includes 90.2 acres. The majority of the construction corridor consists of roadways and residences. Approximately 4.5 acres consist of agricultural uses and irrigation canals.

Transmission Line and Switching Station

Site description - The transmission line route is located entirely on the east side of the Sutter Bypass in Sutter County and is surrounded by agricultural lands. The new transmission line is planned to be routed south along the west side of South Township Road, then west along O'Banion Road to the east levee of the Sutter Bypass. The line will parallel an existing PG&E line which runs along the east side of South Township Road. The line parallels 3.7 miles of irrigation canals. The route also passes four 10 to 20-foot wide canals that may serve as waterfowl flyways. The route will end at a new switching station at the east levee of the Sutter Bypass approximately 0.5 mile south of the Sutter NWR. The switching station will be located south of O'Bannion Road on property currently farmed for rice. Originally, the route would have crossed Gilsizer Slough, which supports emergent marsh vegetation and a large giant garter snake population. The portion of the revised route along O'Bannion Road now roughly parallels Gilsizer Slough, which is one to two miles to the south. The transmission line lies within the Pacific Flyway and a major wintering area for migratory birds. Two existing transmission lines, a WAPA 230-kV line and a PG&E 500-kV line run parallel to the east side of the Sutter Bypass.

Transmission line - A new 4.0 mile 230 kilovolt (kV) overhead electric transmission line will be built to a new switching station which will interconnect to WAPA's 230-kV electric transmission running along the east side of the Sutter Bypass. The line will require 32 steel transmission towers with cement footings, spaced approximately 750 to 880 feet apart. Power poles will be 106-foot tall single metal poles with upswept arms. Conductor wire spacing will be greater than the wing span of large birds (43 inches on the vertical and 60 inches in the diagonal) to prevent electrocutions. The top ground wire will be fitted with bird flight diverters to make the wires more visible. The transmission line will remove 0.003 acre of farmland from production. The construction of the transmission line will use a 50-foot wide corridor.

Switching station - A new switching station will interconnect to WAPA's 230-kilovolt (kV) electric transmission system. The construction of the switchyard will remove 2.2 acres of farmland from production.

Laydown and parking areas of approximately 0.1 to 0.5 acre each along the gas pipeline and electric transmission line routes will be sited on previously disturbed areas and marked with flagging to minimize disturbance.

Timing and Operations

Construction of the SPP project is expected to take 22 to 24 months, from site preparation to commercial operation. Construction is expected to begin in early 1999 and be completed by late in the year 2000. The SPP Project has an expected life of 30 years. Calpine expects a peak work force of 256 employees on site during construction. Full scale commercial operation is expected to begin by the end of 2000 or early 2001. Calpine will employ 20 full-time plant operators and technicians once the plant is complete. Facility maintenance will include vegetation maintenance for weed abatement and fire control.

Proposed Conservation Measures

Calpine has proposed a program of conservation measures to reduce the effects of the SPP project to special status species, wetlands, and wildlife habitats. These measures include: construction monitoring by designated biologists; worker environmental awareness training; construction zone limits; preconstruction surveys; timing restrictions on construction; modifications of project design, operations, and maintenance; replacement of affected habitat; erosion control and revegetation of disturbed areas; and monitoring plans and reports. For federally listed species, Calpine identified the following specific measures:

Measures for giant garter snake:

1. Replace 4.907 acres of upland giant garter snake habitat at a ratio of 3:1. The replacement habitat will include one acre of aquatic habitat for every two acres of upland habitat. Calpine will provide 4.907 acres of aquatic habitat and 9.814 acres of upland habitat for the giant garter snake. Replacement habitat will be located within the Colusa Basin or Sutter Basin subpopulations of giant garter snake.

2. Established a fund for the acquisition of mitigation credits that will facilitate the purchase, enhancement, and management of habitat by the CEC and natural resource agencies.

3. Provide a biological monitor to conduct preconstruction surveys 24 hours prior to ground moving and vegetation clearing activities.

4. Provide worker environmental awareness training.

5. Avoid all trenching and augering during the giant garter snake inactive period (October 1 through May 1) when giant garter snakes are occupying burrows and are susceptible to earth moving activities.

6. Provide a biologist continually on site during the giant garter snakes's inactive period (October 1 through May 1) if construction proceeds past October 1.

7. Revegetate habitats after construction.

8. Use mowing instead of disking as a fire control method on the Sutter Power Plant site.

9. Construct hibernacula in strategic areas of upland habitat.

10. Use herbicide with no residual or migratory effects.

11. Eliminate potential water quality effects by project change to a dry cooling system that eliminates discharge of effluent from cooling towers.

Measures for migratory birds:

1. Install bird flight diverters to transmission line shield wires and strobe lights on the HRSG stack to minimize bird collision potential.

2. Modify transmission lines that bisect potential foraging areas with colored bird flight diverters to make the wires more visible to birds during flight.

3. Provide suitable space between conducting wires to minimize risk of bird electrocution.

4. Monitor electric transmission line collisions for significant effects.

Measures for wetlands:

1. Construct temporary construction zone fencing around wetlands near construction activities.

2. Route SPP stormwater runoff away from remaining wetlands.

3. Mark and avoid all wetlands within the Sutter NWR.

4. Construct pipeline under or along Hughes Road through the Sutter NWR.

Status of the Species and Environmental Baseline

Giant garter snake

The Service published a proposal to list the giant garter snake as an endangered species on December 27, 1991 (56 **FR** 67046). The Service reevaluated the status of the giant garter snake before adopting the final rule. The giant garter snake was listed as a threatened species October 20, 1993 (58 **FR** 54053).

Description - The giant garter snake is one of the largest garter snakes and may reach a total length of at least 64 inches (160 centimeters). Females tend to be slightly longer and proportionately heavier than males. The weight of adult female giant garter snakes is typically 1.1-1.5 pounds (500-700 grams). Dorsal background coloration varies from brownish to olive with a checkered pattern of black spots, separated by a yellow dorsal stripe and two light colored lateral stripes. Background coloration and prominence of black checkered pattern and the three yellow stripes are geographically and individually variable (Hansen 1980). The ventral surface is cream to olive or brown and sometimes infused with orange, especially in northern populations.

Historical and current range - Fitch (1941) described the historical range of the species as extending from the vicinity of Sacramento and Contra Costa Counties southward to Buena Vista Lake, near Bakersfield, in Kern County. Prior to 1970, the giant garter snake was recorded historically from 17 localities (Hansen and Brode 1980). Five of these localities were clustered in and around Los Banos, Merced County. The paucity of information makes it difficult to determine precisely the species' former range. Nonetheless, these records coincide with the historical distribution of large flood basins, fresh water marshes, and tributary streams. Reclamation of wetlands for agriculture and other purposes apparently extirpated the species from the southern one-third of its range by the 1940s -1950s, including the former Buena Vista Lake and Kern Lake in Kern County, and the historic Tulare Lake and other wetlands in Kings and Tulare Counties (Hansen and Brode 1980, Hansen 1980). Surveys over the last two decades have located the giant garter snake as far north as the Butte Basin in the Sacramento Valley.

As recently as the 1970s, the range of the giant garter snake extended from near Burrel, Fresno County (Hansen and Brode 1980), northward to the vicinity of Chico, Butte County (Rossman and Stewart 1987). California Department of Fish and Game (CDFG) studies (Hansen 1988) indicate that giant garter snake populations currently are distributed in portions of the rice production zones of Sacramento, Sutter, Butte, Colusa, and Glenn Counties; along the western border of the Yolo Bypass in Yolo County; and along the eastern fringes of the Sacramento-San Joaquin River delta from the Laguna Creek-Elk Grove region of central Sacramento County southward to the Stockton area of San Joaquin County. This distribution largely corresponds with agricultural land uses throughout the Central Valley.

Essential habitat components - Endemic to wetlands in the Sacramento and San Joaquin valleys, the giant garter snake inhabits marshes, sloughs, ponds, small lakes, low gradient streams, and other waterways and agricultural wetlands, such as irrigation and drainage canals and rice fields, and the adjacent uplands. Giant garter snakes feed on small fishes, tadpoles, and frogs (Fitch 1941, Hansen 1980, Hansen 1988). Essential habitat components consist of: (1) adequate water during the snake's active season (early-spring through mid-fall) to provide food and cover; (2) emergent, herbaceous wetland vegetation, such as cattails and bulrushes, for escape cover and foraging habitat during the active season; (3) upland habitat with grassy banks and openings in waterside vegetation for basking; and (4) higher elevation uplands for cover and refuge from flood waters during the snake's dormant season in the winter (Hansen 1980).

Foraging ecology - Giant garter snakes are extremely aquatic, are rarely found away from water, forage in the water for food, and will retreat to water to escape predators and disturbance. This species occupies a niche similar to some eastern water snakes (*Nerodia* spp). Giant garter snakes are active foragers, feeding primarily on aquatic prey such as fish and amphibians. Historically, prey likely consisted of Sacramento blackfish (*Orthodon microlepidotus*), thick-tailed chub (*Gila crassicauda*), and red-legged frog (*Rana aurora*). Because these species are no longer available (chub extinct, red-legged frog extirpated from the Central Valley, blackfish declining/in low numbers), the predominant food items are now introduced species such as carp (*Cyprinus carpio*), mosquito-fish (*Gambusia affinis*), bullfrogs (*Rana catesbiana*), and Pacific treefrogs (*Pseudacris regilla*) (Fitch 1941, Rossman et al, 1996).

Reproductive ecology - The breeding season extends through March and April, and females give birth to live young from late July through early September (Hansen and Hansen 1990). Brood size is variable, ranging from 10 to 46 young, with a mean of 23 (Hansen and Hansen 1990). At birth young average about 20.6 cm snout-vent length and 3-5 g. Young immediately scatter into dense cover and absorb their yolk sacs, after which they begin feeding on their own. Although growth rates are variable, young typically more than double in size by one year of age (G. Hansen, pers. comm.). Sexual maturity averages three years in males and 5 years for females (G. Hansen, pers. comm.).

Movements and habitat use - The giant garter snake typically inhabits small mammal burrows and other soil crevices throughout its winter dormancy period (i.e., November to mid-March). Although these areas are generally thought to be above prevailing flood elevations, snakes may not always utilize high ground during their winter dormancy period. The BRD has documented giant garter snakes at the Colusa National Wildlife Refuge overwintering in areas with few high ground retreat sites (Wylie *et al.* 1997). Snakes in another study population at Gilsizer Slough overwintered in a low elevation wetland area, even though higher ground was present nearby. Both of these populations survived flooding and were not displaced from the area. Giant garter snakes also use burrows as refuge from extreme heat during their active period. The BRD (Wylie *et al.* 1997) has documented giant garter snakes using burrows in the summer as much as 165 feet

(50 meters) away from the marsh edge. Overwintering snakes have been documented using burrows as far as 820 feet (250 meters) from the edge of marsh habitat.

During radio-telemetry studies conducted by the BRD giant garter snakes typically moved little from day to day. However, total activity varied widely between individuals. Snakes have been documented moving up to 5 miles (8 kilometers) over the period of a few days (Wylie *et al.* 1997). In agricultural areas, giant garter snakes were documented using rice fields in 19-20 percent of the observations, marsh habitat in 20-23 percent of observations, and canal and agricultural waterway habitats in 50-56 percent of the observations (Wylie *et al.* 1997).

Reasons for Decline and Threats to Survival - The current distribution and abundance of the giant garter snake is much reduced from former times. Agricultural and flood control activities have extirpated the giant garter snake from the southern one third of its range in former wetlands associated with the historic Buena Vista, Tulare, and Kern lakebeds. These lakebeds once supported vast expanses of ideal giant garter snake habitat, consisting of cattail and bulrush dominated marshes. Vast expanses of bulrush and cattail floodplain habitat also typified much of the Sacramento Valley historically (Hinds 1952). Prior to reclamation activities beginning in the mid to late 1800s, about 60 percent of the Sacramento Valley was subject to seasonal overflow flooding in broad, shallow flood basins that provided expansive areas of giant garter snake habitat (Hinds 1952). Valley floor wetlands are subject to the cumulative effects of upstream watershed modifications, water storage and diversion projects, as well as urban and agricultural development; all natural habitats have been lost and an unquantifiably small percentage of seminatural wetlands remain extant. Only a small percentage of extant wetlands currently provides habitat suitable for the giant garter snake.

The giant garter snake currently is only known from a small number of populations. The status of these populations and the threats to these snakes and their habitats are detailed in the final rule that listed the giant garter snake as threatened (58 **FR** 54053). A number of land use practices and other human activities currently threaten the survival of the giant garter snake throughout the remainder of its range. Although some giant garter snake populations have persisted at low levels in artificial wetlands associated with agricultural and flood control activities, many of these altered wetlands are now threatened with urban development. Cities within the current range of the giant garter snake that are rapidly expanding include: (1) Chico, (2) Yuba City, (3) Sacramento, (4) Galt, (5) Stockton, (6) Gustine, and (7) Los Banos.

Ongoing maintenance of aquatic habitats for flood control and agricultural purposes eliminate or prevent the establishment of habitat characteristics required by giant garter snakes and can fragment and isolate available habitat, prevent dispersal of snakes among habitat units, and adversely affect the availability of the garter snake's food items (Hansen 1988, Brode and Hansen 1992). Livestock grazing along the edges of water sources degrades habitat quality in a number of ways: (1) eating and trampling aquatic and riparian vegetation needed for cover from predators, (2) changes in plant species composition, (3) trampling snakes, (4) water pollution,

(5) and reducing or eliminating fish and amphibian prey populations. Overall, grazing has contributed to the elimination and reduction of the quality of available habitat at four known locations (Hansen 1982, 1986).

In many areas, the restriction of suitable habitat to water canals bordered by roadways and levee tops renders giant garter snakes vulnerable to vehicular mortality. Fluctuation in rice and agricultural production affects stability and availability of habitat. Recreational activities, such as fishing, may disturb snakes and disrupt basking and foraging activities. Non-native predators, including introduced predatory gamefish, bullfrogs, and domestic cats also threaten giant garter snake populations. While large areas of seemingly suitable giant garter snake habitat exist in the form of duck clubs and waterfowl management areas, water management of these areas typically does not provide summer water needed by giant garter snakes. Although giant garter snakes on national wildlife refuges are relatively protected from many of the threats to the species, degraded water quality continues to be a threat to the species both on and off refuges.

Baseline - Surveys over the last two decades have located the giant garter snake as far north as the Butte Basin in the Sacramento Valley. Currently, the Service recognizes 13 separate populations of giant garter snake, with each population representing a cluster of discrete locality records (USFWS 1993). The 13 extant population clusters largely coincide with historical riverine flood basins and tributary streams throughout the Central Valley (Hansen 1980, Brode and Hansen 1992): (1) Butte Basin, (2) Colusa Basin, (3) Sutter Basin, (4) American Basin, (5) Yolo Basin-Willow Slough, (6) Yolo Basin-Liberty Farms, (7) Sacramento Basin, (8) Badger Creek-Willow Creek, (9) Caldoni Marsh, (10) East Stockton-Diverting Canal and Duck Creek, (11) North and South Grasslands, (12) Mendota, and (13) Burrell-Lanare. These populations span the Central Valley from just southwest of Fresno (Burrell-Lanare) north to Chico (Hamilton Slough). The 11 counties where the giant garter snake is still presumed to occur are: Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo.

Since April of 1995, the BRD has further documented occurrences of giant garter snakes within some of the 13 populations identified in the final rule. The BRD has studied populations of giant garter snakes at the Sacramento and Colusa National Wildlife Refuges within the Colusa Basin, at Gilsizer Slough within the Sutter Basin, and at the Badger Creek area of the Consumnes River Preserve within the Badger Creek-Willow Creek area. These populations, along with the American Basin population of giant garter snakes represent the largest extant populations. With the exception of the American Basin, these populations are largely protected from many of the threats to the species. Outside of these protected areas, giant garter snakes in these population clusters are still subject to all threats identified in the final rule. The remaining nine population clusters identified in the final rule are distributed discontinuously in small isolated patches and are vulnerable to extirpation by stochastic environmental, demographic, and genetic processes. All 13 population clusters are isolated from each other with no protected dispersal corridors. Opportunities for recolonization of small populations which may become extirpated is unlikely given the isolation from larger populations and lack of dispersal corridors between them.

The proposed project occurs within the Sutter Basin and Colusa Basin populations of giant garter snakes. The Sutter, Colusa, and Butte basins make up the Sacramento Valley Recovery Unit identified by the giant garter snake recovery team (USFWS 1998).

Five California Natural Diversity Database (NDDB) locality records are known from the Sutter basin and tributary streams/canals. These locality records include the Snake River, Gilsizer Slough, and various canals within the basin. Gilsizer Slough is a partially channelized natural waterway that runs east-west approximately two miles south of the SPP. The slough is intersected by the Sutter Bypass. Gilsizer Slough supports a population of giant garter snakes and has been a study site for the BRD telemetry study. The BRD estimated that the 1,430-hectare (3,500-acre) Gilsizer Slough study site supported approximately 206 individuals in 1995 and 170 individuals in 1996 (G. Wylie pers. comm. 1998). Giant garter snakes have also been tracked using the East Borrow Ditch within the Sutter Bypass/ Sutter NWR (G. Wylie pers. comm. 1998). Although Gilsizer Slough and the Sutter NWR are relatively protected and support a large population of giant garter snakes, no large protected wetland areas exist outside these two sites. The surrounding Sutter County rice production zone and its associated waterways and drainage canals also support giant garter snakes. Canals and waterways in the vicinity of the SPP site, along the pipeline corridor, and transmission line route provide habitat for the giant garter snake.

Ten NDDB locality records are known from the basin and tributary streams/canals. These records include sightings on Delevan National Wildlife Refuge (NWR), Glenn-Colusa Canal, Colusa Trough, Colusa Basin Drainage Canal, and several tributary streams between the towns of Williams and Maxwell. Currently, Colusa and Sacramento NWRs support populations of giant garter snakes and are study sites for the BRD telemetry study (Glenn Wylie, pers comm; Wylie *et al.* 1997). These represent stable, relatively protected populations of giant garter snakes. However, available information indicates a tenuous connection between localities clustered at the north and south end of the basin.

Other ongoing federal actions in the action area include Bureau of Reclamation (Reclamation) activities under the Central Valley Project Improvement Act to improve water supply to the Sacramento National Wildlife Refuge Complex (SNWRC), SNWRC management activities, and ongoing U.S. Army Corps of Engineers (Corps) flood control projects. Reclamation's refuge will improve water supplies to the Sutter NWR within the Sutter Basin, and Sacramento Delevan, and Colusa NWRs in the Colusa Basin. The project may cause mortalities of giant garter snakes and will result in habitat loss and disturbance. However, Reclamation has consulted with the Service to minimize the effects of their action on listed species, including giant garter snake. The project also will provide the SNWRC with reliable water supplies and more flexibility in management of habitats, including giant garter snake habitat, on the refuges. SNWRC currently is developing management plans to improve availability and quality of habitat for giant garter snakes on the SNWRC and to minimize risk of mortality during maintenance activities. SNWRC also is actively pursuing and participating in restoration projects to benefit giant garter snakes.

Several flood control programs administered by the Corps are ongoing within the Colusa and Sutter Basins. Subsequent to the 1986 flood events, the Corps initiated its Sacramento River Flood Control System Evaluation (SRFCSE) to examine the existing flood control system and to develop remedial repair plans to restore the designed level of protection. Project areas for Phases II, III, and V include the Colusa and Sutter Basins, the Sutter Bypass and it's associated levees and drainage system, and drainage and flood control systems within the Colusa Basin. The Corps also assists in flood control through its Public Law 84-99 (PL 84-99) program. The PL 84-99 program is not based on a comprehensive plan, but rather, responds to requests from local sponsoring agencies for assistance. The Sacramento Bank Protection Project also reviews and responds to needs for improved bank protection on the Sacramento River and its tributaries. Currently, the Sacramento Bank Protection Project is investigating a bank protection project on the Colusa Basin Drain, demonstrating that this program may be applied outside the traditional project areas of the mainstream Sacramento River and its tributaries. These ongoing flood control activities include strengthening and repairing levees, stabilizing levee slopes, relocating or redesigning drainage canals, installing toe drains, dredging waterways, and installing rock riprap. Ongoing flood control activities have resulted in loss and disturbance of a variety of habitat types, including emergent marsh, drainage canals, and adjacent uplands used by the giant garter snake. Activities also may result in mortality of giant garter snakes and may not allow adequate time between disturbance events to allow for recovery of habitat. Although the Corps has consulted on previous projects administered under these programs and is expected to continue to do so, the ongoing nature of these activities and the administration under various programs makes it difficult to determine the continuing and accumulative impacts of these activities.

Aleutian Canada goose

The Aleutian goose was federally listed as endangered on March 11, 1967 (32 **FR** 4001), and reclassified as threatened on December 12, 1990 (55 **FR** 51112). A detailed account of the taxonomy, ecology, and biology of the Aleutian goose is presented in the approved Recovery Plan for this species (USFWS 1991). Supplemental information on the Aleutian goose is provided below.

The Aleutian Canada goose can be distinguished from most other subspecies of Canada geese by their small size (only cackling Canada geese are smaller) and a ring of white feathers at the base of the black neck in birds older than 8 months. Historically, the Aleutian goose nested on most of the larger islands in the Aleutian Islands and in the Commander and northern Kuril Island chains. When it was listed in 1967, the Aleutian goose was only known to nest on Buldir Island in the western Aleutian Islands. Subsequently, remnant flocks have been found on Chagulak Island in the eastern Aleutians, and Kaliktagik in the Semidi Islands. Recovery efforts in the breeding range presently focus on the Semidi Island, and the western and eastern Aleutian Island flocks.

The Aleutian goose's major migration and wintering areas include coastal areas of Oregon and northern California and California's Sacramento and San Joaquin Valleys. The Aleutian goose

migrates between breeding and wintering areas from August to March. Wintering and migrating Aleutian geese forage in harvested corn fields, newly planted or grazed pastures, or other agricultural fields (e.g., rice stubble and green barley). Lakes, reservoirs, ponds, large marshes, and flooded fields are used for roosting and loafing. In winter, Aleutian geese exhibit a crepuscular foraging pattern, roosting in large flocks during most of the day and night and flying to and from foraging areas during the hours around dawn and dusk.

The decline in numbers of Aleutian geese and the reduction of their breeding range is attributed to predation by arctic fox (*Alopex lagopus*), which were introduced on many Aleutian islands by fur traders during the period 1836-1930 (55 FR 239). The role of migration and wintering habitat loss in the historic decline of Aleutian geese is not well understood. Changing land use practices, including the conversion of cropland pastures to housing and other urban development, and sport and subsistence hunting likely contributed to the historical decline (USFWS 1991).

The approved Recovery Plan describes three criteria to be achieved to consider delisting the Aleutian goose. These criteria include: (1) a minimum overall population of 7,500 individuals and a demonstrated upward trend in population numbers, (2) a minimum nesting population of 50 pairs in three geographic parts of its former range, and (3) protection and management of important migration and wintering habitat for feeding and roosting. Current estimates meet or exceed the first two criteria described in the Recovery Plan (Brad Bortner, USFWS, pers. comm.). Most historic nesting islands are protected and managed, in part, for Aleutian goose recovery by the Alaska Maritime National Wildlife Refuge (USFWS 1991). Long-term protection and recovery efforts on important nesting islands have been greatly successful in expanding the Aleutian goose's breeding range and population numbers. Population estimates of Aleutian geese wintering in California during the winter of 1995-1996 reached 24,000 individuals (Bortner, USFWS, pers. comm. 1996), up from less than 800 geese in spring 1975 (Figure 1). However, the lack of adequately protected migration and wintering habitat for Aleutian geese remains the greatest obstacle to full recovery (USFWS 1991).

Baseline - Aleutian geese forage and roost in suitable habitats throughout the Sacramento Valley, including the Sacramento, Colusa, Butte Sink, and Sutter National Wildlife Refuges and the agricultural fields that surround them. The Butte Sink, in particular, is a major fall staging area for Aleutian geese. Aleutian geese migrate to this location in the fall, remain about 1.5 months, then continue south in December (USFWS 1991). Staging geese roost in flooded fields, ponds, and berms in rice fields in the Butte Sink, and fly out to surrounding agricultural fields to forage on waste grains and beans, and sprouting winter wheat. Agricultural fields adjacent to the applicant's 230kV power lines provide suitable Aleutian goose foraging habitat. Recent surveys documented a mixed-species flock of 1,100 geese, including approximately 100 Aleutian geese, foraging in a fallow rice filed north of Hughes Road and east of the Sutter NWR on March 21, 1997 (Calpine 1997, AFC).

American Peregrine Falcon

Species Description and Life History The American peregrine falcon was Federally listed as endangered in 1970 throughout its range in North America which includes the southern portion of Alaska, Canada, the conterminous United States and northern Mexico. Four regional recovery plans were written for the American peregrine falcon: the Alaskan, Canadian, Pacific Coast and Rocky Mountains/Southwest Plans (USFWS 1982a, 1982b, 1984; Erickson *et al.* 1988). These recovery plans describe recovery tasks and provide measurable recovery goals to delist the subspecies. In June 1995, the Service published an advanced noticed of a proposal to remove the American peregrine falcon from the list of threatened and endangered species (60 **FR**34406). Current data indicate the falcon has recovered throughout its range and the Service is currently preparing a draft proposal to delist the taxon (Robt. Mesta, USFWS, pers comm.).

American peregrine falcons are monogamous. After the loss of a mate, the surviving bird typically remates. Peregrine falcons nest almost exclusively on cliff ledges that are associated with suitable foraging areas. American peregrine falcons have also been observed nesting on man made structures in heavily urbanized areas. American peregrine falcons exhibit nest site fidelity; however, new nest locations are often established if a bird remates. The western population of peregrines does not exhibit true migration, however, winter movements southward do occur, especially in young birds. Wintering individuals frequently reside near large concentrations of migratory waterfowl and/or shorebirds.

The peregrine falcon is one of nature's swiftest and most beautiful birds of prey. The name comes from the Latin word *peregrinus*, meaning "foreigner" or "traveler." It is noted for its speed, grace, and aerial skills. There are three subspecies of the peregrine falcon in North America: (1) American, (2) Arctic, and (3) Peale's.

The American peregrine falcon is a specialized predatory raptor that feeds almost entirely on birds captured in flight. Prey includes any available bird species, ranging in size from ducks to songbirds. Nest sites are typically in ledges or small caves on large cliff faces. The western population of peregrines does not exhibit true migration, however, winter movements southward do occur, especially in young birds.

Peregrine falcons are medium-sized hawks with long pointed wings. Adults have slate blue-gray wings and backs barred with black; pale undersides; white faces with a black stripe on each cheek; and large, dark eyes. Younger birds are darker and browner.

Peregrine falcons are roughly crow-sized---about 15-21 inches long---with a wingspan of about 40 inches. As with many raptors, or birds of prey, females are larger than males.
Peregrine falcons live mostly along mountain ranges, river valleys, and coastlines. Historically, they were most common in parts of the Appalachian Mountains and nearby valleys from New England south to Georgia, the upper Mississippi River Valley, and the Rocky Mountains.

Peregrines also inhabited mountain ranges and islands along the Pacific Coast from Mexico north to Alaska and the Arctic tundra.

Peregrine falcons generally reach breeding maturity at 2 years. Usually, the male arrives at a nesting site and begins a series of aerial acrobatic displays to attract a mate. An average clutch of four eggs is laid in the spring, hatching about a month later. Nesting activities begin in March and continue through late June or early July, when young fledge. Following fledging, families may remain at the nest cliff through August or September. Peregrines usually return to the same nesting areas annually but may select different ledges within a 0.5-mile area. Peregrines vigorously defend their nests, although they may abandon them if severely or continuously harassed.

The nest is a scrape or depression dug in gravel on a cliff ledge. Rarely, peregrines will nest in a tree cavity or an old stick nest. Unlike many other animals that cannot coexist with urbanization, some peregrines have readily accepted man-made structures as breeding habitat. For example, skyscraper ledges, tall towers, and bridges serve as the ecological equivalent of a cliff ledge. A conservative estimate of nesting peregrines is 140 nesting pairs in California (Robt. Mesta, USFWS,1999).

Geographic Distribution and Associated Habitat American peregrine falcons formerly occupied most of California except the deserts during migrations and in winter. The California breeding range has been expanding and includes the Channel Islands, the coast of southern and central California, inland areas in northern California, North Coast Ranges, Klamath and Cascade ranges, and the Sierra Nevada (CDFG 1992).

Suitable cliffs are generally higher than 75 feet and steep enough to exclude ground predators (Monk 1980). Preferred cliff aspects are southeast to southwest (Boyce and White 1980). Because peregrine falcons feed on medium-sized birds taken in flight (Monk 1981), they prefer to nest near marshes, lakes, and rivers that produce or attract an abundance of birds. Upland habitats that occur near nests in California are quite variable and may include oak woodlands, conifer forests, meadows, or brushlands. Peregrine falcons nest on cliffs in a wide variety of habitats. The major habitat requirements include cliffs with suitable nesting ledges usually within 1 mile of a water body and also near an abundant source of prey (Jones and Stokes 1988). Most currently occupied cliff sites are at elevations below 4,000 feet (Shimamoto and Airola 1981).

Reasons for Decline and Threats to Survival: Organochlorine pesticides used in the United States were implicated as the major cause in declines of American peregrine falcon populations. The use of these chemicals peaked in the 1950s and early 1960s, and continued through the early 1970s. The use of DDT was restricted in Canada in 1970 and in the United States in 1972 (37 **FR** 13369, July 7, 1992). The use of organochlorines can affect peregrines by either direct mortality or by adversely affecting reproduction. Reproductive failure includes eggshell thinning and breakage, addling, hatching failures and abnormal reproductive behaviors by parents

(Risebrough and Peakall 1988). Peregrines nesting in the central California coast range in the 1980s however continued to have elevated concentrations of organochlorines in eggs (Jarman *et al.*, 1993) and hatchability of artificially incubated eggs was below 50 percent (Linthicum, 1989). Peregrine falcons in California continue to have elevated concentrations of organochlorines and eggshell thinning (Welsh, USFWS, pers comm 1997).

Other unnatural mortality factors which could affect populations include shooting, falconry, collisions with transmission lines, electrocutions, contaminated prey species, and disturbance at nest sites. Peregrines are particularly sensitive to disturbance at the nest site during the breeding season. Human disturbance such as rock climbing, blasting, shooting, timber harvest, road construction, or aerial disturbance can cause peregrines to abandon nest sites. Olendorff and Lehman (1986) report peregrine falcon collisions with transmission lines to have a mortality rate of 83 percent. The swift flight of peregrines is thought to be a contributing factor in fatal collisions.

Critical habitat has been designated for American peregrine falcon in Napa and Sonoma counties, California. American peregrine falcons are not known to nest in the SPP project area. However, the project area contains suitable winter foraging habitat.

Bald Eagle

Species Description and Life History. The bald eagle, a bird of aquatic ecosystems, frequents estuaries, large lakes, reservoirs, major rivers, and some seacoast habitats. Mature bald eagles are distinguished by their white head, white tail, and yellow beak; the female of the species is generally larger than the male. Immature birds have a dusky head and tail, and a dark bill. The bald eagle typically reaches sexual maturity at 4-5 years, the species is monogamous and will remate upon the death of a mate. The bald eagle was federally listed as endangered on February 14, 1978 (43 **FR** 6233) in all of the coterminous United States except Minnesota, Wisconsin, Michigan, Oregon, and Washington, where it was classified as threatened. On August 15, 1995 (60 **FR** 36010), the bald eagle was down-listed to threatened throughout its range. Critical habitat has not been designated for the bald eagle. The recovery plan for the Pacific population of the bald eagle describes the biology, reasons for decline, and the actions needed for recovery (USFWS 1986).

The Pacific Recovery Region for the bald eagle includes the States of California, Oregon, Washington, Idaho, Montana, Wyoming, and Nevada. Other recovery plans exist for bald eagle populations in the Southeast, Southwest, Northern States, and Chesapeake Bay. Delisting/reclassification of the bald eagle in the Pacific Recovery Region is not dependent on the status of bald eagle populations covered by these other plans (USDI-FWS 1986b). For this reason, the Pacific Recovery Region for the bald eagle will be viewed as a recovery unit for purposes of this consultation.

Foraging Ecology: The bald eagle is a generalized predator/scavenger primarily adapted to edges of aquatic habitats. Typically fish comprise up to 70 percent of the nesting eagle diet with mammals, birds, and some amphibians and reptiles providing the balance of the diet. Wintering eagles forage fish, waterfowl, mammals, and a variety of carrion. Bald eagles can maneuver skillfully and frequently hunt from perches. They are also known to hunt by coursing low over the ground or water.

Historic and Current Distribution: The bald eagle is the only North American representative of the fish or sea eagles, and is endemic to North America. The breeding range of the bald eagle includes most of the continent, but they now nest mainly in Alaska, Canada, the Pacific Northwest states, the Great Lake states, Florida, and Chesapeake Bay. The winter range includes most of the breeding range, but extends primarily from southern Alaska and southern Canada, southward.

As of 1996, about 5,068 occupied bald eagle territories were estimated within its range. Of these, 1,274 (25 percent) were estimated to occur within the Pacific Recovery Region, with estimates of 90 pairs in Idaho, 165 pairs in Montana, and 66 pairs in Wyoming (Jody Millar, Bald Eagle Recovery Coordinator, FWS, pers. comm.). As of 1998, there were150 occupied territories in California, 354 in Oregon, 638 in Washington, and 1 in Nevada (Maria Boroja, USFWS, pers comm 1999).

The California bald eagle nesting population has increased in recent years from 40 occupied territories in 1977 to 150 occupied territories in 1998 (R. Jurek, personal communication 1999), approximately 1,100 individuals wintered in California in 1998. The majority of nesting eagles occur in the northern one-third of the state, primarily on public lands. Seventy percent of nests surveyed in 1979 were located near reservoirs (Lehman 1979), and this trend has continued, with population increases occurring at several reservoirs since the time of that study. In southern California, nesting eagles occur at Big Bear Lake, Cachuma Lake, Lake Mathews, Nacimiento Reservoir, and San Antonio Reservoir (Zeiner et. al., 1990). The Klamath Basin in northern California and southern Oregon supports the largest wintering population of eagles in the lower 48 states, where up to 400 birds may congregate at one time. Scattered smaller groups of wintering eagles occur throughout the State near reservoirs, and typically in close proximity to large concentrations of overwintering migratory waterfowl. Clear Lake, Lake County, may support up to 60 wintering eagles and is a mercury-impaired water body. San Antonio Reservoir has become an important wintering area for bald eagles. An estimate of 50+ eagles regularly winter there. Lake Nacimiento also supports as many as 14 wintering eagles, and is an identified mercury-impaired water of the State. Women are precautioned against consuming any large mouth bass and no one should eat more than 24 ounces of large mouth bass per month from this lake (Cal EPA public health warnings). The observed increase in populations is believed to be the result of a number of protective measures enacted throughout the range of the species since the early 1970s. These measures included the banning of the pesticide DDT, stringent protection of nest sites, and protection from shooting.

Reasons for Decline and Threats to Survival: The species has suffered population declines throughout most of its range, including California, due primarily to habitat loss, shooting, and environmental pollution (Snow 1973, Detrich 1986, Stalmaster 1987). The use of DDT and its accumulation caused thin shelled eggs in many predatory birds. After the ban of DDT and other organochlorine compounds, the bald eagle populations started to rebound (USDI-FWS 1986a).

Other environmental contaminants represent potentially significant threats to bald eagles. Dioxin, endrin, heptachlor epoxide, mercury, and polychlorinated biphenyls (PCB's) still occur in eagle food supplies; however, their overall effects on eagle populations are poorly understood (USDI-FWS, 1986a).

Bald eagles are sensitive to human disturbances such as recreational activities, home sites, campgrounds, mines, and timber harvest (Thelander 1973, Stalmaster 1976) when roosting, foraging, and nesting areas are located near these sites. The bald eagle is protected under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. §§ 703-712) and the Bald Eagle Protection Act of 1940, as amended (16 USC §§ 668-668d).

Olendorff and Lehman (1986) collected reports of bald eagles colliding with transmission lines from around the world and covering the period from 1965-1985. The reported mortality rate for bald eagles was 87 percent. Olendorff and Lehman (1986) suggest that the heavy weight of eagles could be a factor in the higher mortalities for eagles than for other smaller buteos. Olendorff *et al.* (1986) observed eagle flight patterns in wintering areas in the vicinity of proposed transmission line routes in California. Eagles were observed flying through drainages, canyons and saddles, across low ridges, over valleys, and were concentrated above high ridges. Eagles usually flew above 100 feet from the ground (Olendorff *et al.* 1986).

Bald eagles have not been observed nesting in the SPP project area. However, bald eagles winter in the Sacramento Valley. One adult bald eagle was observed foraging over fallow, flooded rice fields along Marcuse Road approximately eight miles south of the SPP project site, and one-half mile west of Highway 99 on February 17, 1997.

Effects of the Proposed Action

The action area for this consultation is the Colusa and Sutter Basins. For the reasons described in the project description above, indirect effects associated with the service area of the SPP will not be addressed in this consultation.

Construction of the Sutter Power Plant and associated facilities will result in the loss of 16.74 acres of annual grasslands, 2.2 acres of rice, 0.1 acre of wheat, 0.1 acre of mature walnut orchard, and 3.0 acres of seasonal wetlands that do not provide habitat for federally listed crustaceans. Approximately 6 acres of grassland habitat, primarily adjacent to irrigation canals will be temporarily disturbed during construction of the gas pipeline and transmission line.

Giant garter snake

Construction of the SPP will result in permanent loss of 2.7 acres of giant garter snake habitat. Giant garter snake habitat on the SPP project site consists of upland habitat adjacent to the agricultural canals. Borrow pits on the SPP site may provide limited seasonal foraging if they remain ponded into April, but are not considered primary habitat necessary to support the giant garter snake. The switchyard also consists of upland habitat adjacent to agricultural canals. Construction of the switchyard will result in permanent loss of 2.2 acres. The switchyard will require 1.9 acres, and an additional 0.3 acre surrounding the switchyard will be kept clear of vegetation. During construction of the transmission line, 0.007 acre of uplands will be permanently lost. The SPP and the associated facilities will result in the permanent loss of 4.907 acres of upland giant garter snake habitat. Calpine will provide 4.907 acres of aquatic habitat and 9.814 acres of upland habitat to offset this loss of habitat.

Construction of the transmission line will result in temporary habitat disturbance. The transmission line will run parallel to 3.7 miles of irrigation canals which provide habitat for the giant garter snake. Transmission line construction will not directly disturb the irrigation canals, but may affect giant garter snakes using the canals.

Construction of the pipeline will temporarily disturb approximately 20 canals that will be culverted and trenched. The pipeline will be drilled and bored under five large canals. Approximately 0.5 acre will be temporarily disturbed on either side of the five large canals, resulting in a total of 5 acres of disturbance. Within the 50-foot construction corridor, there are 2.9 acres of irrigation canals that will be disturbed during boring and trenching. The pipeline will parallel an additional 6.5 miles of irrigation canals. Although only a small portion of these canals lie within the construction corridor, construction activities adjacent to the 6.5 miles of canals may affect giant garter snakes using these canals.

All construction activities occurring in giant garter snake habitat may disturb, harass, injure, or kill giant garter snakes. Construction activities may remove vegetative cover and basking sites necessary for thermoregulation, fill or crush burrows or crevices, divert water from habitat and remove the prey base. Temporary fill or culverting of canals and waterways will remove giant garter snake habitat and may obstruct movement of giant garter snakes. Because giant garter snakes utilize small mammal burrows and soil crevices as retreat sites, giant garter snakes may be crushed, buried, or otherwise injured from construction activities. Snakes may killed or injured by construction equipment or other vehicles accessing the construction sites. Calpine estimates that 256 workers will be employed during construction of the power plant. Increases in traffic in the project vicinity due to employees accessing work sites will increase the risk of vehicular mortality. The disturbance from construction activities may also cause giant garter snakes to move into areas of unsuitable habitat where they will experience greater risk of predation or other sources of mortality. Silting, fill, or spill of oil or other chemicals could cause loss of prey items on or downstream of the project sites.

Operation of the SPP project, once it is completed, may affect giant garter snakes occupying the project vicinity. The SPP Project has an expected life of 30 years. SPP closure requires review and approval by the CEC, compliance with the Resource Conservation Recovery Act administered by the Environmental Protection Agency, and includes removal of transmission lines, hazardous wastes. The transmission line poles may provide additional perches for raptors that may prey upon giant garter snakes. Calpine estimates operation of the SPP will require 20 full time employees. Traffic on access roads may increase due to employee trips to and from the SPP. Increases in traffic will increase the risk of road mortality of giant garter snakes. Maintenance of the SPP and Greenleaf 1 facilities will include annual mowing and vegetation control which may kill or injure giant garter snakes and reduce vegetative cover. However, Calpine has proposed to mow with mower blades set to six inches or higher. This measure should minimize giant garter snake mortality and leave some cover in place.

Aleutian Canada goose

The proposed project is likely to injure and kill Aleutian Canada geese as a result of in-flight collisions with the 4.0-mile transmission line and HRSG stacks. The Aleutian goose's crepuscular activity patterns make them particularly susceptible to birdstrikes because of poor visibility during twilight hours when flocks of geese fly between preferred roosting and foraging habitats. The likelihood of birdstrikes occurring would be further increased by fog conditions, which commonly occur in the Sacramento Valley in winter, and by disturbance events, which may cause foraging geese to take flight and land repeatedly in the vicinity of the tranmission lines and towers. Collisions with powerlines may injure Aleutian geese to such an extent that they can no longer fly, making them more susceptible to predation, disrupting their normal behavior patterns, and preventing them from migrating. The construction of two 145-foot tall HRSG stacks could result in avian collisions, particularly during night flights. Habitat provided by Calpine for the giant garter snake (particularly the upland habitat), and for Swainson's hawk may also benefit Aleutina Canada geese by providing foraging habitat.

Sacramento National Wildlife Refuge Complex staff estimate powerline mortalities at Sutter NWR likely number in the hundreds annually (Williams1998). Refuge staff did not indicate species composition. However, Aleutian Canada geese are among the species that utilize Sutter NWR. Birds roosting at Sutter NWR make regular nighttime flights to forage in neighboring rice fields. Nighttime flight behavior of waterfowl may increase susceptibility to powerline collisions. Carcasses of birds killed by collision with powerlines may also serve as substrates for avian botulism. Areas along the route that parallel existing distribution lines may present higher risks of collisions due to clustering of lines. Birds clearing the distribution lines may not gain enough height to clear the transmission lines. The highest potential for collisions may be over larger canals because waterfowl may use these waterways as flyways. Hunting may also cause waterfowl to flush, increasing risk of collisions.

Strobe lights on the HRSG stacks may minimize collision potential. Bird flight diverters on shield wires to increase the visibility of transmission lines may reduce collision risks. Bird flight diverters may reduce collisions 57 percent to 89 percent (APLIC 1994). The monitoring program proposed by Calpine is designed to determine whether the transmission lines will cause significant impacts to migratory birds and special status bird species, and whether any remedial actions are necessary. Remedial actions may include additional bird flight diverters, studies to determine causes of avian collisions, or providing off-site habitat.

American Peregrine Falcon and Bald Eagle

The proposed project will not modify any nesting or foraging habitat for either the bald eagle or peregrine falcon. Indirect effects of the proposed action are the presence and impacts of the existing transmission lines and towers and their potential risks to birds. Transmission lines and towers pose potential risks to birds. The most common risks are electrocution from perching on transmission towers and collision with the guide or shield wire or the transmission. The risk of collision can be affected by the location of the line, behavior of the bird species, and weather conditions. Raptors are generally not as prone to collision with power lines, due to their keen eyesight and maneuverability in flight. However, instances have been reported of collisions of both eagles and falcons. Raptors are most vulnerable to collision while pursuing prey, defending territories, during courtship and escaping predators.

The effects of the action that are most likely to result in take of the species are disturbance and collision. Impacts such as these are likely to occur even in the presence of the mitigation as proposed since eagles and falcons must travel along and past the transmission corridor during foraging, seasonal and daily migrations. The towers supporting the conductors often serve as the perch from which many raptors engage in hunting and courtship, and act as ideal nest sites.

The proposed project poses a potential risk of injury or death due to collision because bald eagles and peregrines are expected to fly across the path of the transmission line to reach foraging or roosting areas. This could result in the take of these species.

Strobe lights on the HRSG stacks may minimize collision potential. Spacing of conductor wires greater than the wing span of large birds is expected to reduce the risk of electrocution. Bird flight diverters on shield wires to increase the visibility of transmission lines may reduce collision risks. Bird flight diverters may reduce collisions 57 percent to 89 percent (APLIC 1994). The monitoring program proposed by Calpine is designed to determine whether the transmission lines will cause significant impacts to migratory birds and special status bird species, and whether any remedial actions are necessary.

Critical habitat for the American peregrine falcon is located outside of the project area and so there would be no effects from the project.

Cumulative Effects

Cumulative effects are those impacts of future State, Tribal, county, local agency, and private actions that are reasonably certain to occur. Future Federal actions will be subject to the consultation requirements established in section 7 of the Act. Our agency is aware of other projects currently under review by State, county, and local authorities where biological surveys have documented the occurrence of the federally proposed or listed species. Projects currently under review by State, county, and local authorities include such actions as urban expansion, water transfer projects that may not have a Federal nexus, and continued agricultural development. The cumulative effects of these known actions pose a significant threat to the eventual recovery of these species.

An undetermined number of future land use conversions and routine agricultural practices are not subject to Federal permitting processes and may alter the habitat or increase incidental take of giant garter snakes and are, therefore, cumulative to the proposed project. These additional cumulative effects include: (1) unpredictable fluctuations in aquatic habitat due to water management; (2) dredging and clearing vegetation from irrigation canals; (3) discing or mowing upland habitat; (4) increased vehicular traffic on access roads adjacent to aquatic habitat; (5) use of burrow fumigants on levees and other potential upland refugia; (6) human intrusion into habitat; (7) diversion of water; and (8) riprapping or lining of canals and stream banks.

Specific cumulative effects related to the proposed action include maintenance activities, which degrade or destroy habitat or cause unpredictable fluctuations in habitat, and market-driven fluctuations in acres of rice cultivation, which may reduce habitat available to giant garter snakes.

Effects of existing power lines in the project area that cause bird strike mortalities are cumulative to the effects of construction of the new transmission line. WAPA has consulted on the effects of its transmission lines; therefore, WAPA lines in the project vicinity are not considered cumulative to the proposed action. However, other existing lines belonging to PG&E are not subject to the consultation requirements established in section 7 of the Act, and therefore represent effects cumulative to the proposed action.

Conclusion

After reviewing the current status of the giant garter snake, bald eagle, American peregrine falcon, and Aleutian Canada goose, the environmental baseline for the action area, the effects of the proposed action and cumulative effects, it is the Sacramento Fish and Wildlife Office's biological opinion that the SPP Project, as proposed, is not likely to jeopardize the continued existence of the giant garter snake, bald eagle, American peregrine falcon, or Aleutian Canada goose. No critical habitat would be adversely modified or destroyed by the proposed action.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are non-discretionary and must be implemented by WAPA so that they become binding conditions of any grant or permits issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. WAPA has a continuing duty to regulate the activity covered by this incidental take statement. If WAPA fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

Amount or Extent of Take

Giant garter snake

The Service anticipates incidental take of giant garter snakes will occur. Giant garter snakes are secretive and notoriously sensitive to human activities. Individual snakes are difficult to detect unless they are observed, undisturbed, at a distance. Most close-range observations represent chance encounters that are difficult to predict. It is not possible to make an accurate estimate of the number of snakes that will be harassed, harmed or killed during construction activities. In instances when take is difficult to detect, the Service estimates take in numbers of species per acre of habitat lost as a result of the action. The Service anticipates that all giant garter snakes inhabiting 4.907 acres of giant garter snake habitat permanently lost as a result of the action will be harassed, harmed, or killed (approximately 2 snakes). The Service anticipates that all giant garter snakes inhabiting approximately 7.9 acres of habitat temporarily disturbed by construction of the pipeline will be harassed, harmed, or killed (approximately 3 snakes). Additionally, all garter snakes inhabiting 10.2 miles of canals and waterways paralleling construction of the transmission line and pipeline will be harassed (approximately 10 snakes). The Service anticipates

that approximately one giant garter snake per year may be harassed, harmed, or killed during operation and maintenance of the proposed project.

Aleutian Canada goose, American peregrine falcon, and bald eagle

The Service anticipates incidental take of bald eagle, American peregrine falcon, and Aleutian Canada geese may occur as a result of implementing the proposed project. Incidental take is possible in two forms. One form is disturbance associated with the maintenance of the transmission line to wintering eagles, falcons, and geese. The second form of take is likely to occur in the form of direct mortality or injury from collision and/or electrocution with the proposed transmission line. Incidental take will be difficult to detect because collisions are difficult to detect, dead or injured birds may be removed by scavengers, and because injured birds may fall or move outside the search area. The Service is unable to quantify the amount or extent of take due to the low likelihood of encountering a dead or injured bird. Therefore, the maximum allowable level of take is estimated at one American peregrine falcon, one bald eagle, and three Aleutian Canada geese during the first year of the project, not to exceed two American peregrine falcon, two bald eagles, and six Aleutian Canada geese over the life of the project.

Effect of the Take

In the accompanying biological and conference opinions, the Sacramento Fish and Wildlife Office has determined that this level of anticipated take is not likely to result in jeopardy to the giant garter snake, Aleutian Canada goose, bald eagle, or American peregrine falcon. No designated critical habitat was considered affected.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize effects of incidental take of giant garter snakes, Aleutian Canada geese, American peregrine falcon, and bald eagle.

Giant garter snake:

1. Harassment, harm, or take of giant garter snakes during construction activities and associated with implementing and operating the SPP project shall be minimized (refer also to Appendix A, Standard Avoidance and Minimization Measures During Construction Activities in Giant Garter Snake Habitat).

2. Impacts of temporary losses and degradation of habitat of giant garter snakes shall be minimized and, to the greatest extent practicable, habitat restored to its pre-project condition. Permanent loss of habitat shall be compensated.

construction activities. Information that should be included in a field report form is provided in Appendix B. The monitoring biologist needs to be available thereafter; if a snake is encountered during construction activities, the monitoring biologist shall have the authority to stop construction activities until appropriate corrective measures have been completed or it is determined that the snake will not be harmed. Giant garter snakes encountered during construction activities should be allowed to move away from construction activities on their own. Capture and relocation of trapped or injured individuals can only be attempted by personnel or individuals with current Service recovery permits pursuant to section 10(a)1(A) of the Act. The biologist shall be required to report any incidental take to the Service immediately by telephone at (916) 979-2725 and by written letter addressed to the Chief, Endangered Species Division, within one working day. The project area shall be re-inspected whenever a lapse in construction activity of two weeks or greater has occurred.

E. Confine clearing to the minimal area necessary to facilitate construction activities.

F. Movement of heavy equipment to and from the project site shall be restricted to established roadways to minimize habitat disturbance.

G. The project proponent shall develop and implement measures to minimize the effects of operations and maintenance on giant garter snakes and their habitat (refer to Appendix C, Standard Avoidance and Minimization Measures During Construction Activities in Giant Garter Snake Habitat and Appendix A, Mitigation Criteria for Restoration and/or Replacement of Giant Garter Snake Habitat). Maintenance and operations activities that may affect giant garter snakes include: canal maintenance, weed and vegetation management, transmission line maintenance, and vehicle access.

2. The following terms and conditions implement reasonable and prudent measure number two:

A. Where feasible, avoid construction activities within 200 feet from the banks of giant garter snake aquatic habitat. Confine construction activities within 200 feet of aquatic giant garter snake habitat to the minimal area necessary. Avoided giant garter snake habitat shall be designated as Environmentally Sensitive Areas and shall be flagged by a qualified biologist approved by the Service and avoided by all construction personnel.

B. After completion of construction activities, any temporary fill and construction debris shall be removed and, wherever feasible, disturbed areas shall be restored to pre-project conditions. Restoration work may include replanting emergent

vegetation (refer to Appendix A, Mitigation Criteria for Restoration and/or Replacement of Giant Garter Snake Habitat).

C. Permanent losses of habitat shall be compensated at the ratio of 3:1 and meet the criteria listed in Appendix A, Mitigation Criteria for Restoration and/or Replacement of Giant Garter Snake Habitat).

D. All wetland and upland acres created and provided for the giant garter snake shall be protected in perpetuity by a Service-approved conservation easement or similarly protective covenants in the deed. The conservation easement on the mitigation habitat shall be recorded at the county recording office prior to groundbreaking. The easement/deed, including a title report for the land area, shall be reviewed and approved by the Service prior to recording in the appropriate County Recorders Office(s). A true copy of the recorded easement/deed shall be provided to the Service within 30 days after recordation. Standard examples of deed restrictions and conservation easements are available from the Service upon request.

E. WAPA shall ensure compliance with the Reporting Requirements below.

3. The following term and condition implements reasonable and prudent measure number three:

Consistent with measures and practices provided in the Avian Powerline Line Interaction Committee's 1994 and 1996 State of the Art Handbooks (APLIC 1994 and 1997), WAPA shall ensure:

A. All transmission lines are equipped with bird flight diverters;

B. Suitable spacing is provided between conductor wires to minimize risk of electrocution; and

C. Implementation of an avian collision monitoring plan to determine if the transmission lines and HRSG stack cause significant impacts to migratory birds. The Monitoring Plan will identify remedial actions should impacts be determined to be significant.

Reporting Requirements

The Sacramento Fish and Wildlife Office is to be notified within three working days of the finding of any listed species or any unanticipated harm to the species addressed in this biological opinion. The Service contact person for this is the Division Chief for Endangered Species at (916) 979-

2725. Any dead or severely injured giant garter snake, American peregrine falcon, bald eagle, or Aleutian Canada goose shall be transferred to the Fish and Wildlife Service's Law Enforcement Office at 3310 El Camino Avenue, Suite 140, Sacramento, CA; telephone (916) 979-2986.

The Service-approved biologist shall notify the Service immediately if giant garter snakes are found on site as detailed in term and condition 1D, and will submit a report including date(s), location(s), habitat description, and any corrective measures taken to protect the snake(s) found. The Service-approved biologist shall submit locality information to the California Department of Fish & Game (CDFG), using completed California Native Species Field Survey Forms or their equivalent, no more than 90 calendar days after completing the last field visit of the project site. Each form shall have an accompanying scale map of the site such as a photocopy of a portion of the appropriate 7.5 minute U.S. Geological Survey map and shall provide at least the following information: township, range, and quarter section; name of the 7.5' or 15' quadrangle; dates (day, month, year) of field work; number of individuals and life stage (where appropriate) encountered; and a description of the habitat by community-vegetation type.

A post-construction compliance report prepared by the Service approved monitoring biologist shall be forwarded to the Chief, Endangered Species Division, at the Sacramento Fish and Wildlife Office within 60 calendar days of the completion of each project. This report shall detail (i) dates that construction occurred; (ii) pertinent information concerning the applicant's success in meeting project mitigation measures; (iii) an explanation of failure to meet such measures, if any, and recommendations for remedial actions and request for approval from the Service, if necessary; (iv) known project effects on federally listed species, if any; (v) occurrences of incidental take of federally listed species, if any; and (vi) other pertinent information.

Review Requirements

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed project. If during the course of this action, this minimized level of incidental take is exceeded, such incidental take would represent new information requiring review of the reasonable and prudent measures provided. The Federal agencies must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species and the ecosystems upon which they depend. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on

listed species or critical habitat, to help implement recovery plans, or to develop information and data bases.

1. As a Recovery Plan for the giant garter snake is developed, WAPA should assist the Service in its implementation.

2. WAPA should incorporate into bidding documents the enclosed "Standard Avoidance and Minimization Measures for Construction Activities in Giant Garter Snake Habitat" when appropriate.

3. WAPA, in partnership with the Service, should develop maintenance guidelines for WAPA projects that will reduce adverse effects of routine maintenance on giant garter snakes and their habitat. Such actions may contribute to the delisting and recovery of the giant garter snake by preventing degradation of existing habitat and increasing the amount and stability of suitable habitat.

4. WAPA should conduct random ground searches for bird strickes during migration and wintering periods.

5. WAPA should participate in mid-winter bird surveys on the Sutter NWR.

6. WAPA should prepare a comprehensive planning process for future siting and placement of transmission lines that evaluates the effects of transmission lines on sensitive habitats, migratory birds, and special status species.

7. WAPA should fund and participate in research on avian collision and electrocution, cost effective ways of burying transmission lines, and develop alternative transmission methodologies.

In order to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed and proposed species or their habitats, the Sacramento Fish and Wildlife Office requests notification of the implementation of any conservation recommendations.

REINITIATION --CLOSING STATEMENT

This concludes the formal consultation for the proposed Sutter Power Project as outlined in the request for consultation. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in these opinions; (3) the agency action

is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in these opinions; or (4) a new species is listed or critical habitat designated that may be affected by the action.

Please contact Jan Knight or Kelly Hornaday at (916) 979-2120 (Sacramento Valley Branch) if you have any questions regarding this biological opinion.

Sincerely,

Karen J. Miller

for Cay C. Goude
Acting Field Supervisor

cc: PARD (ES), Portland, OR
NMFS, Santa Rosa, CA (Attn: Chris Mobley)
Corps of Engineers, Sacramento, CA (Attn: Dave Tedrick)
CDFG, Endangered Species, Sacramento, CA (Attn: Deborah McKee)
CDFG, Region 2, Rancho Cordova, CA (Attn: Larry Eng)
CEC, (Linda Spiegel, Paul Richins)
CH2M Hill (Debra Crowe)

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Bortner, Brad, U.S. Fish and Wildlife Service, Region 1, Portland, Oregon.

Hansen, G., Consulting Environmental Biologist, 3230 Brookwood Road, Sacramento, CA 95821.

Mesta, Robert. Ornithologist. U.S. Fish and Wildlife Service, Ventura Fish and Wildlife Office, California.

Welsh, Daniel. U.S. Fish and Wildlife Service, Environmental Contaminants Divison, Sacramento, CA.

Wylie, G. D. USGS, Biological Resources Division, Western Ecological Research Center, Dixon Field Station, Dixon, California.

Standard Avoidance and Minimization Measures During Construction Activities in Giant Garter Snake Habitat

GIANT GARTER SNAKE
(*Thamnophis gigas*)

HABITAT TYPE:

Marshes, sloughs, ponds, small lakes, low gradient streams, irrigation and drainage canals, and rice fields. Permanent aquatic habitat, or seasonally flooded during the snake's active season (early-spring through mid-fall), with herbaceous wetland vegetation, such as cattails and bulrushes, grassy banks (often salt grass), and uplands for cover and retreat sites during the snake's active season and for refuge from flood waters during the dormant season (winter). Giant garter snakes are typically absent from larger rivers and other water bodies that support introduced populations of large, predatory fish, and from wetlands with sand, gravel, or rock substrates. Riparian woodlands typically do not provide suitable habitat because of excessive shade, lack of basking sites, and absence of giant garter snake prey.

AVOIDANCE AND MINIMIZATION MEASURES:

Avoid construction activities within 200 feet from the banks of giant garter snake aquatic habitat. Confine movement of heavy equipment to existing roadways to minimize habitat disturbance.

Construction activity within habitat should be conducted between May 1 and October 1. This is the active period for giant garter snakes and direct mortality is lessened, because snakes are expected to actively move and avoid danger. Between October 2 and April 30 contact the Service's Sacramento Fish and Wildlife Office to determine if additional measures are necessary to minimize and avoid take.

Confine clearing to the minimal area necessary to facilitate construction activities. Flag and designate avoided giant garter snake habitat within or adjacent to the project area as Environmentally Sensitive Areas. This area should be avoided by all construction personnel.

Construction personnel should receive Service-approved worker environmental awareness training. This training instructs workers to recognize giant garter snakes and their habitat(s).

24-hours prior to construction activities, the project area should be surveyed for giant garter snakes. Survey of the project area should be repeated if a lapse in construction activity of two weeks or greater has occurred. If a snake is encountered during

construction, activities shall cease until appropriate corrective measures have been completed or it has been determined that the snake will not be harmed. Report any sightings and any incidental take to the Service immediately by telephone at (916) 979-2725.

Any dewatered habitat should remain dry for at least 15 consecutive days after April 15 and prior to excavating or filling of the dewatered habitat.

After completion of construction activities, remove any temporary fill and construction debris and, wherever feasible, restore disturbed areas to pre-project conditions. Restoration work may include such activities as replanting species removed from banks or replanting emergent vegetation in the active channel.

Compensate loss and disturbance of giant garter snake habitat according to Table 1. Mitigation ratios are based on the acreage and on the duration of disturbance.

TABLE 1 - SUMMARY OF GIANT GARTER SNAKE PROGRAMMATIC MITIGATION LEVELS

	IMPACTS: DURATION	**IMPACTS:** ACRES	**MITIGATION:** COMPENSATION
LEVEL 1	1 season	Less than 20 and temporary	Restoration
LEVEL 2	2 seasons	Less than 20 and temporary	Restoration plus 1:1 replacement
LEVEL 3	More than 2 seasons and temporary Permanent loss	Less than 20 and temporary Less than 3 acres total giant garter snake habitat AND Less than 1 acre aquatic habitat; OR Less than 218 linear feet bank habitat	3:1 Replacement (or restoration plus 2:1 replacement) 3:1 Replacement

Giant garter snake habitat includes 2.0 acres of surrounding upland habitat for every

1.0 acre of aquatic habitat. The 2.0 acres of upland habitat also may be defined as 218 linear feet of bankside habitat which incorporates adjacent uplands to a width of 200 feet from the edge of each bank. Each acre of created aquatic habitat should be supported by two acres of surrounding upland habitat. Compensation may include creating upland refuges and hibernacula for the giant garter snake that are above the 100-year flood plain.

A season is defined as the calendar year period between May 1 and October 1, the active period for giant garter snake when mortality is less likely to occur.

Information to Include in a Project Monitoring Report for Giant Garter Snake

1. Date

2. Surveyor

3. Project information (should include the following):
    a. Project name
    b. Location
    c. Project impacts and acres impacted

4. Survey information (should include the following):
    a. Time of day
    b. Temperature at start and end of survey. Include ambient temperature, temperature at ground level, and at approximately 3 inches above ground level.
    c. Weather conditions (include wind conditions and cloud cover)
    d. Acres/area surveyed

5. Site description (may include the following):
    a. Habitat types present, substrate/soils, etc.
    b. Topography/elevation
    c. Surrounding land-use/activity
    d. Description of project features

6. Habitat characteristics:
    a. Burrows/potential hibernacula present? (Y/N)
    b. Amount and type of cover present, including upland and emergent vegetation
    c. Prey species present? (Y/N)
    d. Distance to nearest available habitat
    e. Other species observed

7. Giant garter snakes present? (Y/N) If observed provide the following information:
    a. Number of individuals, and if possible to determine, whether juveniles or adults
    b. Location(s)
    c. Describe behavior and activity
    d. Describe protective measures implemented

8. Describe on site mitigation and avoidance measures implemented (fencing, dewatering, worker awareness training, etc.). Include any difficulties implementing measures and corrective measures taken.

Report all sightings to the US Fish and Wildlife Service, Sacramento Fish and Wildlife Office at (916) 979-2725, and to the California Department of Fish and Game (CDFG). The monitoring biologist must submit all sightings to CDFG Natural Diversity Data Base (NDDB) using a California Native Species Field Survey Form and provide copies to CDFG and the Service.

Appendix U

Commission Order Adopting Revised Presiding Member's Proposed Decision Docket No. 97-AFC-2; Dated March 17, 1999

Sierra Nevada Customer Service Region

STATE OF CALIFORNIA

Energy Resources Conservation
and Development Commission

In the Matter of:	)	Docket No. 97-AFC-2
	)	
Application for Certification for the	)	COMMISSION ORDER
Sutter Power Plant Project	)	ADOPTING REVISED PRESIDING
	)	MEMBER'S PROPOSED DECISION

This Commission ORDER adopts the Revised Presiding Member's Proposed Decision (Revised PMPD) and Committee Amendments and Errata to Revised Presiding Member's Proposed Decision (Amendments), in the above-captioned matter. It is based upon the evidentiary record of these proceedings (Docket No. 97-AFC-2) and considers the comments received at the March 17, 1999 Business Meeting. The text of the Revised PMPD contains a summary of the proceedings, the evidence presented, and the rationale for the findings reached and conditions imposed. This ORDER adopts by reference, the text, conditions, compliance verifications, and appendices contained in the Revised PMPD. It adopts specific requirements contained in the Revised PMPD which determine that the proposed facility will be designed, sited, and operated in a manner to protect environmental quality, to assure public health and safety, and be designed to operate in a safe and reliable manner.

This Decision does not grant a license to construct and operate the proposed facility, as specified below. We will consider this matter at our Business Meeting of April 14, 1999.

FINDINGS

The Commission hereby adopts the following Findings in addition to those contained in the text of the Revised PMPD:

1. The Sutter Power Plant Project conforms with the 12-year forecast of statewide and service area electrical power demands and the integrated assessment of need adopted by the Commission in the *1996 Electricity Report* pursuant to Public Resources Code sections 25305(e) and 25308, and is therefore consistent with the requirements of Title 20, California Code of Regulations, section 1752(a):

2. The Conditions of Certification contained in the Revised PMPD assure that the project will not result in any significant adverse environmental impacts.

3. There are no feasible site alternatives to the project site that would accomplish the project objectives and are environmentally superior to the project as mitigated by the Conditions of Certification in the Revised PMPD.

4. Implementation of the Conditions of Certification and Compliance Verifications contained in the text of the Revised PMPD will ensure protection of environmental quality, require quality engineering and design, and assure reasonable safe and reliable operation of the facility.

5. Subject to the exception noted in Finding 6 which follows, the Conditions of Certification and Compliance Verifications contained in the Revised PMPD, if implemented by Applicant, ensure that the project will be designed, sited, and operated in conformity with applicable local, regional, state and federal standards, ordinances, regulations and laws, including applicable public health and safety standards, and air and water quality standards.

6. The project does not presently comply with the Sutter County General Plan and applicable zoning. This non-compliance can be eliminated if the Sutter County Board of Supervisors grants a General Plan amendment and zoning change. The Applicant has pending a request for the required amendment and zoning change.

7. The proceedings leading to this ORDER were conducted in conformance with the applicable provisions of the Commission's regulations governing the consideration of an Application for Certification (Cal. Code of Regs., tit. 20, secs. 1700 et seq.) and thereby meet the requirements of Public Resources Code, sections 21000 et seq. and 25500 et seq.

8. The Commission ORDER applies only to the Sutter Power Plant Project, including the associated electrical transmission lines, switching stations, the natural gas supply tap line and associated terminals.

9. The project's underground natural gas pipeline will cross the Sutter National Wildlife Refuge. It will do so in a manner consistent with the primary use of the refuge and by avoiding all significant environmental effects. The United States Fish and Wildlife Service has granted approval for the project's natural gas pipeline to cross the Sutter National Wildlife Refuge.

ORDER

Therefore, the Commission **ORDERS** the following:

1. The Revised Presiding Member's Proposed Decision as amended, for the Sutter Power Project described in this document is hereby approved as complying with the environmental review provision set forth in the Warren Alquist Act [PRC. sec. 25523(a)], and the California Environmental Quality Act (PRC. sec. 21080.5). It also complies with requirements in the Warren-Alquist Act for review of project engineering

and design, reasonably safe and reliable operation, and compliance with demand conformance.

2. The approval of the Revised Presiding Member's Proposed Decision is subject to the timely performance of the Conditions of Certification and Compliance Verifications enumerated in the accompanying text and Appendices. The Conditions and Compliance Verifications are integrated with this Decision and are not severable therefrom. While Applicant may delegate the performance of a Condition or Verification, the duty to ensure adequate performance of such may not be delegated.

3. The Commission hereby adopts the Conditions of Certification, Compliance Verifications, and associated dispute resolution procedures as part of this Revised Presiding Member's Proposed Decision in order to implement the compliance monitoring program required by Public Resources Code section 25532.

4. Commission approval of the Revised Presiding Member's Proposed Decision constitutes final environmental review of the project by the Commission as lead agency under the California Environmental Quality Act.

5. Commission approval of the Revised Presiding Member's Report makes all findings required by law with the exception of finding that the proposed facility complies with local land use requirements.

6. After the Sutter County Board of Supervisors makes its decision on the pending General Plan amendment and zoning change, and the formal result of that decision is forwarded to the Commission, the Commission will take final action regarding certification of the project for construction and operation.

Dated: March 17, 1999

ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION

WILLIAM J. KEESE
Chairman

-OPPOSED-
DAVID A. ROHY, Ph.D.
Vice Chair

JANANNE SHARPLESS
Commissioner

ROBERT A. LAURIE
Commissioner

MICHAL C. MOORE
Commissioner

Sutter Power Project

Mitigation Action Plan *for the* Sutter Power Project Interconnection

Prepared to Accompany
DOE/EIS 0294

Sierra Nevada
Customer Service Region
Western Area Power Administration
U.S. Department of Energy
May 1999

Table of Contents

Mitigation Action Plan
for the
Sutter Power Project Interconnection

INTRODUCTION

Calpine Corporation (Calpine) proposes to construct the Sutter Power Project (SPP) in Sutter County, California, on a portion of a 77-acre parcel of land owned by Calpine (see Figure 1, page 5). The SPP will consist of a nominal 500-megawatt (MW) net electrical output natural gas-fired, combined-cycle generating facility. The power plant and Western's Keswick-Elverta and Olinda-Elverta double-circuit 230-kilovolt (kV) transmission lines will be interconnected by a generation tie line consisting of approximately 4 miles of 230-kV transmission line and a 230-kV switching station at some point south and west of the plant. This generation tie line will be constructed as a double-circuit transmission line, but initially operated as a single circuit. A new 12-mile natural gas pipeline would be constructed to provide fuel for the project. The SPP will be a "merchant plant," selling power on a short-term and midterm basis to customers, and on the spot market. Calpine will assume all economic costs. Power produced by this plant will be sold at the market price and made available to all market participants.

Calpine submitted a request to Western for a direct interconnection of Calpine's SPP with Western's electric transmission system. In response to this request, Western completed an Interconnection Feasibility Study that determined it would need certain direct interconnection facilities, modification of associated facilities and operational adjustments to its transmission system to accommodate the SPP generation. Western is moving forward on an Interconnection Agreement with Calpine for the SPP, including agreements for making the appropriate modifications to Western's transmission system.

Western is the lead federal agency pursuant to the National Environmental Policy Act (NEPA) for the SPP. The California Energy Commission (Commission), a regulatory agency of the state of California, has the statutory authority to license thermal power plants of 50 MW or more and is the state lead agency for the SPP. The Commission prepares environmental documentation equivalent to the California Environmental Quality Act. Western and the Commission determined that joining the two processes would provide many benefits to the public. The Commission and Western released a joint *Draft Environmental Impact Statement (EIS)/Final Staff Assessment (FSA)* in October 1998. Following the release of Western's *Draft EIS*, Western determined that the next document in the Commission process, the *Presiding Member's Proposed Decision (PMPD*), would be an inappropriate form for Western to present responses to comments on the *Draft EIS*. Western was concerned that combining the *PMPD* and the *Final EIS* could appear to predecision the outcome of the review process. Therefore, Western prepared its own *Final EIS*, with input from the Commission. Western released

the *Final EIS* in April 1999. Western has prepared *a Record of Decision (ROD)* for the SPP and this *Mitigation Action Plan (MAP)* details the specific mitigation required in that *Record of Decision*. This *MAP* was developed in accordance with NEPA (42 U.S.C. 4321, et seq.), the Council on Environmental Quality NEPA implementing regulations (40 CFR parts 1500-1508), and Department of Energy regulations implementing NEPA procedures (10 CFR part 1021). This *MAP* specifically addresses the requirements of 10 CFR § 1021.331 on mitigation action plans.

MITIGATION

The EIS process identified impacts that would occur as a result of the proposed action and a series of mitigative measures to minimize those impacts. A total of 165 Conditions of Certification, essentially mitigation measures and controls, were identified in the Commission's Decision on the SPP. Western has summarized all of these conditions in the *Final EIS*, Appendix O. However, not all of these Conditions relate to Western's action of agreeing to an interconnection. This *MAP* details mitigation for those actions needed to allow an interconnection with Western's transmission system. The site specific mitigation measures listed in Appendix A are fully described in the *Final EIS* (Appendix 0) and in the Commission's Decision. These documents should be reviewed in conjunction with this plan to better understand the mitigation measures listed in the appendix. Additionally, some mitigative measures were included to provide Western with information to monitor and interact with the project, as necessary, such as providing the names of project managers, etc.

Copies of the Draft and Final EIS may be obtained by contacting:

Ms. Loreen McMahon, Environmental Project Manager
Sierra Nevada Customer Service Region
Western Area Power Administration
114 Parkshore Drive, Folsom, CA 95630-4710
Telephone: (916) 353-4460
E-mail: mcmahon@wapa.gov

Websites containing these documents and information regarding this project include:

Western Area Power Administration: **http://www.wapa.gov**
U.S. Department of Energy: **http://www.tis.eh.doe.gov/nepa/**

MONITORING AND REPORTING

Western's Sierra Nevada Customer Service Region will monitor the mitigation described in this Plan (Appendix A). In accordance with DOE Order 5440.1E, Western will submit

an annual report to DOE's Office of NEPA Policy and Assistance, EH-42, beginning with the first Annual Site Environmental Report prepared after the onset of construction activities, regarding the status of the mitigative measures and any changes associated with them. (The changes could come about as the result of a landowner request or changes in the status of an environmental resource.) The Commission's Compliance Project Manager (CPM) will monitor the 165 Conditions of Certification. Western will be consulted on these actions, where appropriate. Western's contact for mitigation monitoring will be the Environmental Project Manager, see above.

CONSERVATION

Section 7(a)(1) of the Endangered Species Act (ESA) directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs benefiting endangered and threatened species and the ecosystems upon which they depend. To that end, Western will incorporate conservation recommendations provided in the U.S. Fish and Wildlife Service (FWS)[1] biological opinion, to the extent practicable.

This *MAP* has provisions for the FWS conservation recommendation to include random ground searches for bird strikes during migration and wintering periods.[2]

DOCUMENT PREPARERS

Loreen McMahon, Environmental Project Manager

Nick Chevance, Environmental Specialist

Nancy Werdel, Environmental Manager

DOCUMENTS REFERENCED

California Energy Commission. 1999. *Commission Decision: Application for Certification for the Sutter Power Plant Project, Docket No. 97-AFC-2.* Sacramento, CA.

Calpine Corporation. 1998. *Biological Resources Mitigation Implementation Plan for the Sutter Power Plant Project, Sutter County, California.* Sacramento, CA.

[1] SPP Final EIS, Appendix T.
[2] Ibid, page 31.

Western Area Power Administration and California Energy Commission. 1998. *Final Staff Assessment/Draft Environmental Impact Statement Filed Jointly for the Sutter Power Project (Application for Certification 97-AFC-2), Sutter County, California*. Sacramento, CA.

Western Area Power Administration. 1999. *Sutter Power Project Final Environmental Impact Statement (DOE-EIS 0294).* Sacramento, CA

LIST OF ACRONYMS

BO	biological opinion
BRMIMP	Biological Resource Mitigation Implementation and Monitoring Plan
Calpine	Calpine Corporation
CBO	chief building official
CCR.	California Code of Regulations
CDFG	California Department of Fish and Game
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
Commission	California Energy Commission
COC	Condition of Certification (Commission)
Corps	U.S. Army Corp of Engineers
CPM	Compliance Project Manager (Commission)
CRMMP	Cultural Resources Monitoring and Mitigation Plan
EIS	Environmental Impact Statement
FSA	Final Staff Assessment
FWS	U.S. Fish and Wildlife Service
HRSG	heat recovery steam generators
kV	kilovolt
LORS	laws, ordinances, regulations and standards
MAP	Mitigation Action Plan
MP	mile post
MW	megawatt
NAHC	Native American Heritage Commission
NEPA	National Environmental Quality Act
PMPD	Presiding Member's Proposed Decision
Project owner	Calpine Corporation
RE	resident engineer
ROD	Record of Decision
SHPO	State Historic Preservation Officer
SPP	Sutter Power Project
Western	Western Area Power Administration

AREA MAP

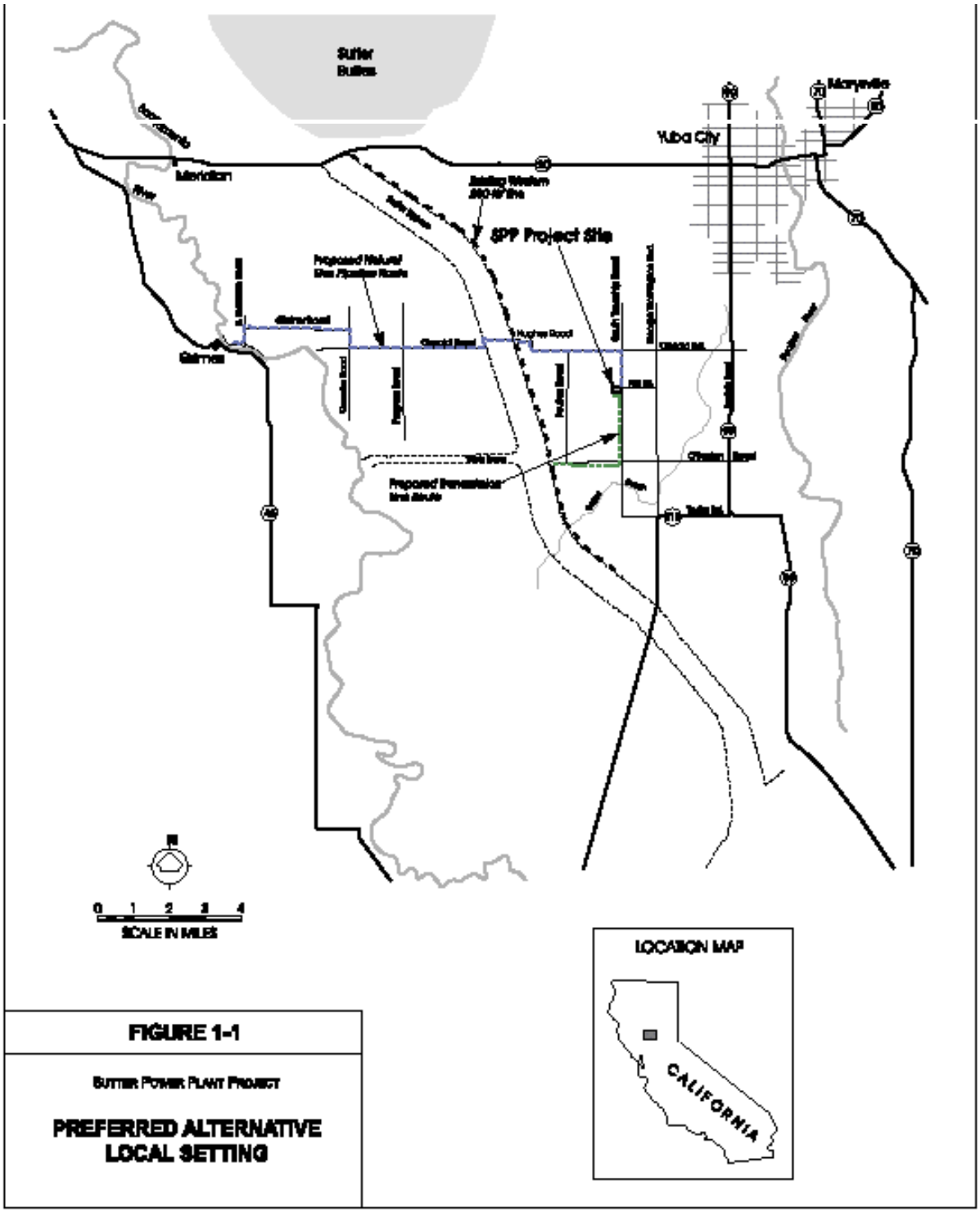

FIGURE 1-1

SUTTER POWER PLANT PROJECT

PREFERRED ALTERNATIVE LOCAL SETTING

Appendix A:

Mitigation of Interconnection Impacts by Resource[1]

AIR QUALITY

A. ENVIRONMENTAL COORDINATOR

Description of Commission Condition of Certification (COC): Prior to the start of construction (defined as any construction-related vegetation clearance, ground disturbance and preparation and site excavation and soil remediation activities), the project owner shall provide the CPM with the following information: the name, telephone number, resume and indication of the environmental coordinator's on-site availability.

Protocol: The resume shall include appropriate education and/or experience in environmental management or coordination such as monitoring hazardous waste site remediation, experience as an inspector with an air pollution control district, or experience as an environmental health and safety project manager.

The CPM will review the qualifications of, and must approve in writing, the project owner's designated environmental coordinator prior to the start of construction.[2]

COMMISSION VERIFICATION PROCESS	WESTERN MONITORING
At least 30 days prior to the start of construction, the project owner shall submit to the CPM for review and written approval the information required above.[3]	Calpine will provide Western with a copy of the CPM approval and the resume of the selected environmental coordinator.

[1] This document does not attempt to quote verbatim the Commission's Conditions of Certification. The COC information is provided as background data for Western's monitoring. A COC citation is provided for reference to the complete text, located in the SPP Final EIS.
[2] SPP Final EIS, Appendix O, page 1, AQ-3.
[3] Ibid, page 1, AQ-3.

LAND USE

A. SUTTER COUNTY BOARD OF SUPERVISORS COORDINATION

Description of Commission Condition of Certification: Where indicated by safety concerns, the transmission line shall have a minimum clearance of 42 feet from the ground to the conductor at maximum sag and the transmission line shall be designed to satisfy the safety concerns of Sutter Extension Water District and Sutter County (on behalf of aerial applicator safety, and public safety), including any applicable provisions of Article 86, state of California High Voltage Electrical Safety Order, section 2946.[4]

COMMISSION VERIFICATION PROCESS	WESTERN MONITORING
At least 30 days prior to the start of construction the project owner shall submit to the CPM a copy of a letter from the Sutter County Board of Supervisors stating that the Board of Supervisors has conferred with Calpine and the Sutter Extension Water District to agree on measures necessary to ensure compliance of the transmission line with the applicable provisions of Article 86, state of California High Voltage electrical Safety Order, section 2946.[5]	Calpine will provide Western with the letter from the Sutter County Board of Supervisors at the same time it is submitted to the CPM.

VISUAL RESOURCES

A. TRANSMISSION LINE PLAN

Description of Commission Condition of Certification: To minimize potential visual impacts, the project owner shall place all electrical transmission poles so as to not be directly in front of any residence and, to the extent possible, so as to not be directly in the view of the Sutter Buttes from any residence.

Protocol: At least 60 days prior to construction of the transmission line, the project owner shall submit a plan to the CPM showing:

- All proposed pole locations;
- All residences within one-quarter mile of the proposed transmission line route that have a view of the transmission line;

[4] SPP Final EIS, Appendix O, page 8, Land Use-5.
[5] Ibid.

- The line of sight from each of the residences toward the Sutter Buttes.

Project owner shall prepare and submit a revised plan if the CPM provides notification to the project owner that it is needed for approval.

Transmission pole placement shall not begin before the plan is approved. The project owner shall notify the CPM when the poles have been installed and are ready for inspection.[6]

COMMISSION VERIFICATION PROCESS	WESTERN MONITORING
At least 60 days prior to beginning transmission line construction, the project owner shall provide the electrical transmission pole plan to the CPM for review and approval. If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall submit to the CPM a revised plan within 30 days of receiving that notification The project owner shall notify the CPM within seven days after completing transmission line construction that the line is ready for inspection.[7]	Calpine will provide a copy of the transmission line plan (and any requested revisions) to Western at the same time they submit the required material to the CPM.

BIOLOGICAL RESOURCES

A. DESIGNATION OF BIOLOGIST

Description of Commission Condition of Certification: Construction-site and/or ancillary facilities preparation (described as any ground-disturbing activities other than allowed geotechnical work) shall not begin until the CPM-approved, designated biologist is available on site.

Protocol: The designated biologist must meet the following minimum qualifications:

1) A bachelor's degree in biological sciences, zoology, botany, ecology or a closely related field;

[6] SPP Final EIS, Appendix O, page 11, VIS-7.
[7] Ibid.

2) Three years of experience in field biology or current certification of a nationally recognized biological society, such as the Ecological Society of America of the Wildlife Society;

3) One year of field experience with resources found in or near the project area;

4) Ability to demonstrate to the satisfaction of the CPM the appropriate education and experience for biological resource tasks to be addressed during project construction and operation.

If, within 30 days of receiving the proposed designation, the CPM determines the proposed designated biologist is unacceptable, the project owner shall submit another individual's name and qualifications for consideration.

If the approved designated biologist needs to be replaced, the project owner shall obtain approval of a new designated biologist by submitting to the CPM the name, qualifications, address and telephone number of the proposed replacement.

No disturbance will be allowed in any designated sensitive area(s) until the CPM approves a new designated biologist and designated biologist is on-site.[8]

COMMISSION VERIFICATION PROCESS	WESTERN MONITORING
At least 30 days prior to the start of rough grading, the project owner shall submit to the CPM for approval, the name, qualifications, address and telephone number of the individual selected by the project owner as the designated biologist. If a designated biologist is replaced the information on the proposed replacement as specified in the Condition must be submitted in writing at least 10 working days prior to the termination or release of the preceding designated biologist.[9]	Calpine will provide Western with a copy of the qualifications of the CPM-approved biologist and a copy of the Commission-approval and designation of the designated biologist prior to the commencement of construction activities. Calpine will submit the biologist's qualifications to the FWS for approval. The designated biologist will comply with the FWS reporting documentation and provide copies of all communications with the FWS to Western.

B. BIOLOGICAL NON COMPLIANCE PROTOCOL

Description of Commission Condition of Certification: The project owner's supervising construction and operating engineer shall act on the advice of the designated biologist to ensure conformance with the biological resource COC.

[8] SPP Final EIS, Appendix O, page 11, BIO-1.
[9] Ibid.

Protocol: The project owner's supervising construction and operating engineer shall halt, if needed, all construction activities in areas identified by the designated biologist as sensitive to ensure potential significant biological resource impacts are avoided.

The designated biologist shall:

1) Tell the project owner and the supervising construction and operating engineer when to resume construction;
2) Advise the CPM if any corrective actions are needed or have been instituted.[10]

COMMISSION VERIFICATION PROCESS	WESTERN MONITORING
Within two working days of a designated biologist's notification of non compliance with a Biological Resources Condition or a halt of construction, the project owner shall notify the CPM by telephone of the circumstances and actions being taken to resolve the problem or the non compliance with a COC. For any necessary corrective action taken by the project owner, a determination of success or failure will be made by the CPM within five working days after receipt of notice that corrective action is completed, or the project owner will be notified by the CPM that coordination with other agencies will require additional time before a determination can be made.[11]	Calpine will ensure that its supervising construction and operating engineer act on the advice of the designated biologist and understand the biologist has the authority to halt construction, if the biologist deems it necessary. Within two working days of a designated biologist's notification of non-compliance with a Biological Resources Condition or a halt of construction. Calpine shall notify Western by telephone of the circumstances and actions being taken to resolve the problem or the non-compliance. The designated biologist shall ensure the FWS Sacramento Office Division Chief for Endangered Species (3310 El Camino Avenue, Suite 130, Sacramento, CA, 95821-6340, 916/979-2725) is appropriately notified and consulted regarding endangered species as noted in the biological opinion.[12] This coordination includes all monitoring, notifying and reporting requirements. The designated biologist will comply with the FWS reporting documentation and provide copies of all communications with the FWS to Western.

C. WORKER ENVIRONMENTAL AWARENESS PROGRAM

Description of Commission Condition of Certification: The project owner shall develop and implement a Worker Environmental Awareness Program, in which each

[10] SPP Final EIS, Appendix O, page 12, BIO-3.
[11] Ibid.
[12] Ibid., Appendix T.

of its own employees, as well as employees of contractors and subcontractors who work on the project site or related facilities (including any access roads, storage areas, transmission lines, water and gas lines) during construction and operation, are informed about biological resource sensitivities associated with the project.

Protocol: The Worker Environmental Awareness Program:

1) Shall be developed by the designated biologist and consist of an on-site or classroom presentation in which supporting written material is made available to all participants;
2) Must discuss the locations and types of sensitive biological resources on the project site and adjacent areas;
3) Must present the reasons for protecting the resources;
4) Must present the meaning of various temporary and permanent habitat protection measures;
5) Must identify who to contact if there are further comments and questions about the material discussed in the program.

The program can be administered by a competent individual(s) acceptable to the designated biologist.

Each participant in the on-site Worker Environmental Awareness Program shall sign a statement declaring that the individual understands and shall abide by the guidelines set forth in the program material. The person administering the program shall also sign each statement.

The signed statements for the construction phase shall be kept on file by the project owner and made available for examination by the CPM for a period of at least six months after the start of commercial operation. Signed statements for the project owner for the duration of their employment and for six months shall keep active operational personnel on file after their termination.[13]

COMMISSION VERIFICATION PROCESS	WESTERN MONITORING PROCESS
At least 30 days prior to the start of rough grading, the project owner shall provide copies of the Worker Environmental Awareness Program and all supporting written materials prepared by the designated biologist and the name and qualifications of the person(s) administering the program to the CPM for approval. The project owner shall	Calpine will consult with the FWS in the preparation of the Worker Environmental Awareness Program and provide documentation of this consultation to Western. At least 30 days prior to the start of construction of the transmission line and/or substation, Calpine shall provide copies of the Worker Environmental Awareness Program to

[13] SPP Final EIS, Appendix O, page 12, BIO-4.

COMMISSION VERIFICATION PROCESS	WESTERN MONITORING PROCESS
state in the monthly compliance report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date.[14]	Western.

D. GIANT GARTER SNAKE MITIGATION

Description of Commission Condition of Certification: The project owner shall ensure the following measures are implemented to avoid or mitigate project impacts to giant garter snakes:

1) Avoid trenching or auguring activities within 200 feet of giant garter snake habitat from October 2 through April 30, where feasible.

2) Have the designated biologist on-site during construction activities that occur between October 1 and May 1. The FWS will be contacted if a giant garter snake is found trapped and they will come out to remove it.

3) Within 24 hours prior to the start of construction activities, the site shall be inspected for snakes by the designated biologist. Observed snakes should be reported and cleared to an area that will not be affected by construction within the next 24 hours. If a snake is encountered during construction activities, the designated biologist shall be contacted and take appropriate measures to ensure the snake is not harmed.

4) Avoid obstructing the flow of water through the canals (dewatering). Any dewatered habitat must remain dry for at least 15 consecutive days after April 15 and 15 consecutive days prior to excavating or filling dewatered habitat.

5) Prevent construction activities run off from entering giant garter snake habitat.

6) Restrict vegetation clearing to the minimal area necessary to facilitate construction activities. Mark and avoid giant garter snake habitat in or adjacent to the project that will not be directly affected by construction activities.

7) Provide replacement habitat at a location acceptable to FWS and the California Department of Fish and Game (CDFG) to compensate for habitat lost.

8) Mow, rather than disk, to control vegetation on-site. Mower blades should be raised to at least 6 inches during the snake's active period of May 1 to October 1.

9) Conduct activities to clear vegetation in the irrigation canals as necessary to minimize disturbance to snake habitat and in accordance with methods approved by FWS and CDFG.

10) Eliminate wastewater discharge (as described in Condition Soils&Water-2[15]).[16]

[14] SPP Final EIS, Appendix O, BIO-4.
[15] Ibid., Appendix O, page 18.

COMMISSION VERIFICATION PROCESS	WESTERN MONITORING
At least 45 days prior to rough grading, the project owner shall provide to the project CPM for review and approval written documentation (BRMIMP, BIO-12[17]) that these measures will be or have been taken by the licensee. The documentation will specify the procedures used or that will be used to implement these measures.[18]	Western will provide oversight of construction activities to ensure transmission line and/or substation construction activities: (a) avoid auguring activities within 200 feet of giant garter snake habitat between October 2 and April 30, (b) have the CPM-approved biologist on-site between October 1 and May 1, (c) have all areas to be disturbed checked for snakes by the biologist and within 24-hours prior to commencement of construction activities, the site shall be inspected by the biologist, who will prepare a field report for Western and the FWS, (d) minimize vegetation clearing within snake habitat, (e) environmentally sensitive habitat will be flagged by the biologist, as he determines necessary for avoidance, (f) use mowing for fire control, rather than disking, (g) use herbicides with no residual or migratory effects, (h) revegetate habitat after construction, and (i) Calpine shall provide Western with documentation of habitat compensation.

E. SWAINSON'S HAWK MITIGATION

Description of Commission Condition of Certification: The project owner shall ensure the following measures are implemented to mitigate or avoid project impacts to Swainson's hawks:

[16] SPP Final EIS, Appendix O, page 13, BIO-8.
[17] BRMIMP is a CA Energy Commission term for Biological Resource Mitigation Implementation and Monitoring Plan.
[18] SPP Final EIS, Appendix O, page 13, BIO-8.

1) The designated biologist shall conduct preconstruction surveys during March through June construction years to determine if an active nest site is within 0.5 miles of construction activities.

2) The owner shall design the project to avoid removal of nest trees and to avoid placement of the transmission line within 0.1 mile of nest trees.

3) The designated biologist shall monitor construction activities that occur within 0.5 miles of an active next site between March 1 and August 15 or until fledglings are no longer dependent on the nest tree. The monitoring plan shall be acceptable to CDFG.[19]

COMMISSION VERIFICATION PROCESS	WESTERN MONITORING
At least 45 days prior to rough grading, the project owner shall provide to the project CPM for review and approval written documentation (BRMIMP, Bio-12) that the above measures will be accomplished by the applicant and specify the procedures used or that will be used to implement these measures.[20]	Calpine shall provide Western with documentation that the above measures are accomplished. Western will consult with the designated biologist to ensure the project owner avoids placement of transmission line poles within 0.1 miles of Swainson's hawk nesting trees.

F. MIGRATORY BIRD MITIGATION

Description of Commission Condition of Certification: The project owner shall ensure the following measures are implemented to mitigate or avoid project impacts to migratory birds:

1) Powerlines shall be constructed following recommendations in *Suggested Practices for Raptor Protection on Power Lines; The State of the Art in 1996* (Avian Powerline Interaction Committee, 1996).

2) Powerlines located in sensitive areas (e.g., over Gilsizer Slough and through potential foraging or flyway areas) shall be fitted with bird flight diverters placed on the ground wire at 16.4-foot intervals. Sensitive areas shall be identified in the BRMIMP (COC Bio-12).

3) Between October through March, measures shall be taken in areas of high migratory bird use (such as Gilsizer Slough) to flush birds from the construction area prior to stringing wires.

4) Develop a monitoring plan to analyze whether the transmission line and HRSG[21] stacks are causing significant impacts from avian collision and/or electrocutions. If it is determined that significant impacts are occurring, remedial mitigation

[19] SPP Final EIS, Appendix O, page 13, BIO-9. (A full summary of this COC was not included above.)
[20] Ibid., page 13, BIO-9.
[21] HRSG: heat recovery steam generators.

measures shall be proposed and implemented. A report presenting the monitoring data and a discussion of the mitigation effectiveness shall be provided annually for 10 years following the completion of construction. If it can be shown that impacts to birds from the project are not occurring, the licensee has the option to request staff to decrease the frequency or cease monitoring.[22]

COMMISSION VERIFICATION PROCESS	WESTERN MONITORING[23]
At least 45 days prior to rough grading, the project owner shall provide to the project CPM for review and approval written documentation (BRMIMP, Bio-12) that these measures will be accomplished by the licensee and specify the procedures used or that will be used to implement these measures. The avian collision/electrocution monitoring plan annual report shall be provided to the project CPM no later than December 31 for each year monitoring is required.[24]	Western will provide oversight of construction activities to assure the transmission line and substation activities: (a) Consider the *Practices for Raptor Protection on Power Lines; The State of the Art in 1996*, (b) Fit powerlines located in areas sensitive to migratory birds with bird flight diverters placed on the ground wire at 16.4 –foot intervals, (c) Provide suitable spacing between conductor wires to minimize risk of electrocution, (d) Attempt to flush birds from construction areas prior to stringing wires, (e) Have an avian collision monitoring plan. As a conservation measure, the plan shall include a provision for random ground searches for bird strikes during migration and wintering periods.

G. WETLAND MITIGATION

Description of Commission Condition of Certification: The project owner shall ensure the following measures are implemented to mitigate or avoid project impacts on wetlands:

1) Provide in-kind replacement habitat at a location acceptable to FWS for wetlands impacted by the project (BIO-13).

[22] SPP Final EIS, Appendix O, page 14, BIO-10. (A full summary of this COC was not included above.)
[23] Although Western's Biological Assessment indicated that strobe lights would be used on the HRSG stacks to deter avian collision, it was subsequently determined through the NEPA process and public involvement that strobe lights would cause a visual impact. Therefore, they will not be utilized.
[24] SPP Final EIS, Appendix O, page 14, BIO-10.

2) Establish an endowment account adequate to provide funds for the perpetual maintenance and management of the replacement habitat.

3) Mark and avoid all wetlands on site that will not be directly taken by the power plant footprint and all wetlands along Hughes Road in the Sutter National Wildlife Refuge.

4) Protect on-site wetlands not taken by the power plant footprint in perpetuity or provide replacement habitat at a location and ratio acceptable to FWS and establish an endowment account adequate to provide funds for the perpetual maintenance and management of the replacement habitat.

5) Use an air-cooled condenser to eliminate wet-cooling tower evaporation and incorporate drains designed to route contaminated runoff away from the remaining wetlands or develop and implement a monitoring program to ensure the wetlands remaining on-site are not degraded by project operations. The program shall include parameters acceptable to FWS that monitor hydrologic quality and productivity, and identify and defend reference or control wetlands for comparative analysis. If it is determined that the on-site wetlands are negatively impacted, propose remedial mitigation measures to be implemented. A report presenting the monitoring data and a discussion of the mitigation effectiveness shall be provided annually for the life of the project. If it can be shown that wetlands are not being negatively impacted, the licensee has the option to request Commission staff to decrease the frequency or cease monitoring.

6) Place a construction cloth over wetlands that could be impacted only or where feasible, otherwise the wetlands will only be marked and flagged for avoidance.

7) Place the pipeline under or in the shoulder of Hughes Road.[25]

COMMISSION VERIFICATION PROCESS	WESTERN MONITORING
At least 45 days prior to rough grading, the project owner shall provide to the project CPM for review and approval written documentation (BRMIMP, BIO-12) that the above measures will be accomplished by the licensee and specify the procedural terms for implementing these measures. The wetland monitoring plan annual report shall be provided to the project CPM no later than July 1 for each year monitoring is completed.[26]	Calpine shall provide Western with written documentation verifying that the above measures have been accomplished. Calpine shall provide Western with a copy of the Wetland Monitoring Plan and subsequent annual report(s).

[25] SPP Final EIS, Appendix O, page 14.
[26] Ibid., page 14, BIO-11.

H. FINAL BIOLOGICAL REPORTING

Description of Commission Condition of Certification: The project owner shall submit to the CPM for review and approval a copy of the *final Biological Resources Mitigation Implementation and Monitoring Plan.*

Protocol: *The Biological Resources Mitigation Implementation and Monitoring Plan* shall identify:

- All sensitive biologic resources to be impacted, avoided or mitigated by project construction and operation;
- All conditions agreed to in the FWS biological opinion and California Department of Fish and Game (CDFG) Incidental Take Permit;
- All mitigation, monitoring and compliance conditions included in the Commission's Final Decision;
- All conditions agreed to the in the U.S. Army Corps of Engineers (Corps) Clean Water Act permits;
- All conditions specified in the CDFG Streambed Alteration permit, if required;
- Required mitigation measures for each sensitive biological resource;
- Required habitat compensation, including provisions for acquisition, enhancement and management, for any loss of sensitive biological resources;
- A detailed plan for protecting the existence and monitoring the integrity of the wetlands remaining on-site;
- A detailed description of measures to be taken to avoid or mitigate temporary disturbances from construction activities;
- All locations, on a map of suitable scale, of laydown areas and areas requiring temporary protection and avoidance during construction;
- Aerial photographs of all areas to be disturbed during project construction activities–one set prior to site disturbance and one set subsequent to completion of mitigation measures. Include planned timing of aerial photography and description of why times were chosen;
- Monitoring duration for each type of monitoring and a description of monitoring methodologies and frequency;
- Performance standards to be used to help decide if/when proposed mitigation is or is not successful;
- All remedial measures to be implemented if performance standards are not met; and
- A process for proposing plan modifications to the CPM and appropriate agencies, for review and approval.[27]

[27] SPP Final EIS, Appendix O, page 15, BIO-12.

COMMISSION VERIFICATION PROCESS	WESTERN MONITORING
At least 45 days prior to rough grading, the project owner shall provide the CPM with the final version of the *Biological Resources Mitigation Implementation and Monitoring Plan* for this project. The CPM will determine the plan's acceptability within 15 days of receipt of the final plan. The project owner shall notify the CPM five working days before implementing any modifications to the BRMIMP. Within 30 days after completion of construction, the project owner shall provide the CPM, for review and approval, a written report identifying which items of the BRMIMP have been completed, a summary of all modifications to mitigation measures made during the project's construction phase and which condition items are still outstanding.[28]	Calpine will review the December, 1998 *Draft Final BRMIMP* and determine if modifications are needed to meet the requirements of the Federal biological opinion. They shall submit written results of this review to Western for review and approval. A final, updated BRMIMP will be provided to Western. Calpine will work with the Commission to ensure that both the BRMIMP and the *Mitigation Action Plan* are coordinated and implemented.

CULTURAL RESOURCES

A. DESIGNATION OF CULTURAL RESOURCE SPECIALIST

Description of Commission Condition of Certification: Prior to the start of project construction (defined as any construction-related vegetation clearance, ground disturbance and preparation and site excavation activities), the project owner shall provide the CPM and Western with the name(s) and qualifications of its designated cultural resource specialist and mitigation team members.

The designated cultural resource specialist shall be responsible for implementing all the cultural resource COCs, using qualified personnel to assist him or her in project-related field surveys, monitoring, data collection and artifact recovery, mapping, mitigation, analysis of recovered cultural resources and data or report preparation.

After CPM and Western approval of the Cultural Resource Monitoring and Mitigation Plan (CRMMP) (Cul-3),[29] the designated cultural resource specialist and team shall be available to implement the mitigation plan prior to, and throughout construction of the project.

[28] SPP Final EIS, Appendix O, page 15, BIO-12.
[29] Ibid., page 22, CUL-3.

Protocol: The project owner shall provide the CPM and Western with a resume or statement of qualifications for its designated cultural resources specialist and mitigation team members. The resume(s) shall include the following information:

1) The resume for the designated cultural resource specialist shall demonstrate that the specialist meets the following minimum qualifications: a graduate degree in archeology, anthropology, California history or cultural resource management; at least three years of cultural resource mitigation and field experience in California, including at least one year's experience leading cultural resource field surveys; leading site mapping and data recording; marshaling equipment necessary and leading archaeological resource recovery operations; the need for appropriate sampling and/or testing in the field and in the lab; directing the analyses of mapped and recovered materials and data; and the preparation of appropriate reports to be filed with the receiving curation repository, the appropriate regional information center(s), the State Historic Preservation Officer (SHPO), Western and the CPM.

2) The resume for the designated cultural resource specialist shall include a list of specific projects the specialist has previously worked on; the role and responsibilities of the specialist for each project listed; and the names and phone numbers of contacts familiar with the specialist's work on these referenced projects.

3) If additional personnel will be assisting the designated cultural resource specialist in project-related field surveys, monitoring, data and artifact recover, mapping, mitigation, material analysis or report preparation, the project owner shall also provide names, addresses and resumes for these team members.

4) If the CPM and Western determine the qualifications of the proposed cultural resource specialist are not in concert with the above requirements, the project owner shall submit another individual's name and qualifications for consideration.

5) If the previously approved designated cultural resource specialist is replaced prior to completion of project mitigation, the project owner shall obtain CPM and Western approval of the new designated cultural resource specialist by submitting to the CPM and Western the name and qualifications of the proposed replacement specialist at least ten days prior to the termination or release of the preceding designated cultural resource specialist.[30]

COMMISSION VERIFICATION PROCESS	WESTERN MONITORING
At least 90 days prior to the start of construction, the project owners shall submit the name and resume of its designated cultural resource specialist to the CPM and Western for review and written approval.	Western shall review the qualifications of the project owner's selection for the designated cultural resource specialist and provide written approval or disapproval

[30]SPP Final EIS, Appendix O, page 21, CUL-1.

COMMISSION VERIFICATION PROCESS	WESTERN MONITORING
Thirty days prior to construction, the project owner shall confirm in writing to the CPM, who will notify Western, that the previously approved designated cultural resource specialist and the team of assistants are prepared to implement the monitoring and mitigation measures for cultural resources, as described in the Cultural Resources Monitoring and Mitigation Plan. At least 10 days prior to the termination or release of a designated cultural resource specialist, the project owner shall obtain CPM and Western approval of the new designated cultural resource specialist by submitting to the CPM and Western the name and resume of the proposed replacement specialist.[31]	

B. PROJECT MAPS AND DRAWINGS OF FACILITIES

Description of Commission Condition of Certification: Prior to the start of project construction, the project owner shall provide the designated cultural resource specialist and the CPM with maps and drawings for the SPP. The final center lines and right-of-way boundaries shall be provided on 7.5 minute quad maps, and the location of all the various areas where surface disturbance may be associated with project-related access roads, storage yards, laydown sites, pull sites, pump or pressure stations, Sutter Bypass switching station, on-site switchyard, electrical tower or pole footings, etc.[32]

COMMISSION VERIFICATION PROCESS	WESTERN MONITORING
At least 90 days prior to the start of construction on the project, the project owner shall provide the designated cultural resource specialist, the CPM, and Western with final maps at appropriate scale(s) and drawings for all project facilities.[33]	Western will review the maps and drawings and coordinate with the designated cultural resource specialist and the CPM, as appropriate.

[31] SPP Final EIS, Appendix O, page 21, CUL-1.
[32] Ibid., page 22, CUL-2. (A full summary of this COC was not included above.)
[33] Ibid., page 22, CUL-2.

C. CULTURAL RESOURCES MONITORING AND MITIGATION PLAN

Description of Commission Condition of Certification: Prior to the start of project construction, the designated cultural resource specialist shall prepare a draft Cultural Resources Monitoring and Mitigation Plan to identify general and specific measures to minimize potential impacts to significant cultural resources. The CPM will review, and must approve in writing, the draft Cultural Resources Monitoring and Mitigation Plan. The CPM will provide copies of the draft plan to Western so that Western may submit this plan to the SHPO for concurrence prior to the project owner taking any actions under the approved monitoring and mitigation plan.

Protocol: The Cultural Resources Monitoring and Mitigation Plan shall include, but not be limited to, the following elements and measures:

a) A discussion of the sequence of project-related tasks, such as any final preproject surveys, fieldwork, flagging or staking; construction monitoring; mapping and data recovery; preparation for recovering cultural resources; preparation of recovered materials for analysis, identification, and inventory; preparation of preliminary and final reports; and preparation of materials for curation.

b) An identification of the person(s) expected to assist with each of the tasks identified in above, a discussion of the mitigation team leadership and organizational structure and the inter-relationship of tasks and responsibilities.

c) When sensitive areas are to be monitored during construction or avoided during operation, the designated cultural resource specialist shall identify measures such as flagging or fencing to prohibit or otherwise restrict access to sensitive resource areas. The discussion should address how these measures will be implemented prior to the start of construction and how long they will be needed to protect the resources from project-related effects.

d) Where the need for monitoring of project construction activities has been determined by Western, the designated cultural resource specialist, in consultation with the CPM, will establish a schedule for the monitor(s) to be present. If the designated cultural resource specialist determines the likelihood of encountering cultural resource or sites in certain areas is slight, monitoring may be discontinued in that location.

e) If cultural resources are encountered are exposed during project-related grading, excavation, augering, and/or trenching, the designated cultural resource specialist shall have the authority to halt or redirect construction in the immediate vicinity of the find until the specialist can determine the significance of the find. The designated cultural resource specialist shall act in accordance with the following procedures:

   - The project owner, or designated representative, shall inform the CPM and Western within one working day of the discovery of any potentially significant cultural resources and discuss the specific measure(s) proposed to mitigate potential impacts to these resources.

- The designated cultural specialist, representatives of the project owner, Western, and the CPM shall confer within 5 working days of the notification of the CPM, if necessary, to discuss any mitigation measures already implemented or proposed to be implemented, and to discuss the disposition of any finds.
- The SHPO will be consulted on potential eligibility, effect and proposed mitigative measures. As the federal lead agency, Western will initiate the consultations with the SHPO.
- All required data recovery and cultural resource impact mitigation shall be completed as expeditiously as possible.

f) All isolates encountered will be recorded and mapped; all lithic scatters and/or cultural resource sites will be recorded and mapped and all diagnostic artifacts will be collected for analysis; and all recovered cultural resource materials will be prepared and delivered for curation into a retrievable storage collection in a public repository or museum that meets the Title 36 CFR 79 standards for the curation of cultural resource materials.

g) The identification of the public institution that has agreed to receive any maps and data, records, reports and any cultural resource materials recovered during project-related monitoring and mitigation work. Also include a discussion of any requirements or specification for materials delivered for curation and how they will be met. The name and phone number of the contact person at the institution shall be included as well.[34]

COMMISSION VERIFICATION PROCESS	WESTERN MONITORING
At least 60 days prior to the start of construction, the project owner shall provide the CPM and Western with a copy of the draft Cultural Resources Monitoring and Mitigation Plan prepared by the designated cultural resource specialist. The CPM and Western will provide written approval or disapproval of the proposed Cultural Resources Monitoring and Mitigation Plan within 15 days of receipt of the submittal. If the draft plan is not approved, the project owner, the designated cultural resources specialist, the CPM and Western shall meet to discuss comments and work out necessary changes.[35]	At least 60 days prior to the start of construction, the project owner shall provide the CPM and Western with a copy of the draft Cultural Resources Monitoring and Mitigation Plan prepared by the designated cultural resource specialist. The CPM and Western will provide written approval or disapproval of the proposed Cultural Resources Monitoring and Mitigation Plan within 15 days of receipt of the submittal. If the draft plan is not approved, the project owner, the designated cultural resources specialist, the CPM and Western shall meet to discuss comments and work out necessary changes.

[34] SPP Final EIS, Appendix O, page 22, CUL-3.
[35] Ibid.

D. DEVELOPMENT OF CULTURAL RESOURCES EMPLOYEE TRAINING PROGRAM

Description of Commission Condition of Certification: Prior to the start of construction on the project, the designated cultural resource specialist shall prepare an employee training program. The designated cultural resource specialist shall submit the training program to the CPM and Western for review and written approval.

Protocol: The training program shall address the potential to encounter cultural resources during project-related site preparation and construction activities, the sensitivity and importance of these resources and the legal obligations to preserve and protect such resources.

The training program shall also include the set of reporting procedures workers are to follow if any cultural resources are encountered during project activities. This training program may be combined with other training programs prepared for paleontological and biological resources, hazardous materials or any other areas of interest or concern.[36]

COMMISSION VERIFICATION PROCESS	WESTERN MONITORING
At least 30 days prior to the start of construction, the project owner shall submit to the CPM and Western for review, comment and written approval, the proposed employee training program and set of reporting procedures the workers are to follow if cultural resources are encountered during project construction. Western may be required to submit this training plan to the SHPO for concurrence as part of the consultation process. The CPM and Western shall provide written approval or disapproval of the employee training program and set of procedures within 15 days after receipt of the submittal. If the draft training program is not approved, the project owner, the designated cultural resource specialist, the CPM and Western shall confer as needed to achieve any necessary changes.[37]	At least 30 days prior to the start of construction, the project owner shall submit to the CPM and Western for review, comment and written approval, the proposed employee training program and set of reporting procedures the workers are to follow if cultural resources are encountered during project construction. Western may be required to submit this training plan to the SHPO for concurrence as part of the consultation process. The CPM and Western shall provide written approval or disapproval of the employee training program and set of procedures within 15 days after receipt of the submittal. If the draft training program is not approved, the project owner, the designated cultural resource specialist, the CPM and Western shall confer as needed to achieve any necessary changes.

[36] SPP Final EIS, Appendix O, page 23, CUL-5.
[37] Ibid.

E. IMPLEMENTATION OF CULTURAL RESOURCES EMPLOYEE TRAINING PROGRAM

Description of Commission Condition of Certification: Prior to the start of construction, and throughout the project construction period as needed for all new employees, the project owner and the designated cultural resource specialist shall provide the approved training to all project managers, construction supervisors and workers who operate ground-disturbing equipment. The project owner and construction manager shall provide the workers with the approved set of procedures for reporting any cultural resources discovered during project-related ground disturbance.[38]

COMMISSION VERIFICATION PROCESS	WESTERN MONITORING
Prior to the start of construction, and throughout the project construction period as needed for all new employees, the project owner and the designated cultural resource specialist shall present the CPM- and Western-approved training program on the potential for project impacts to sensitive cultural resources. The training shall include a set of reporting procedures for cultural resources encountered during project activities. The project owner shall provide documentation in the monthly compliance report to the CPM that the employee training and the set of procedures have been provided to all project managers, construction supervisors and to all workers.[39]	Calpine shall provide documentation (e.g., a list of names, instructor, date completed) containing the names of persons who have completed the training to Western on a quarterly basis.

F. CULTURAL RESOURCES REPORTING-1

Description of Commission Condition of Certification: Throughout the project construction period, the project owner shall provide the designated cultural resource specialist with a current schedule of weekly project activity and a map indicating the area(s) where construction activities will occur. The designated cultural resource specialist shall consult daily with the project superintendent or construction field manager to confirm the area(s) to be worked on the next day(s).

Throughout the monitoring and mitigation phase of the project, the designated cultural resource specialist shall maintain a daily log of monitoring and mitigation activities carried out by the specialist and members of the cultural resource mitigation team. The designated cultural resource specialist shall prepare summary reports on

[38] SPP Final EIS, Appendix O, page 23, CUL-6.
[39] Ibid.

monitoring activities, any cultural resource finds and recovery efforts and the progress or status of the resource monitoring, mitigation, preparation, identification and analytical work being conducted for the project. Copies of these summaries shall be included in the monthly compliance reports file with CPM by the project owner. The CPM will forward copies of these summary reports to Western. The designated cultural resource specialist may informally discuss the cultural resource monitoring and mitigation activities with their Commission technical counterpart at any time.[31]

COMMISSION VERIFICATION PROCESS	WESTERN MONITORING
The project owner shall include, in the monthly compliance reports to the CPM, a summary of the daily logs prepared by the designated cultural resource specialist; the CPM will forward copies to Western.[40]	Calpine shall inform Western of any cultural resource finds and recovery efforts, as needed.

G. CULTURAL RESOURCES REPORTING-2

Description of Commission Condition of Certification: The designated cultural resource specialist shall be present at the construction site at all times when construction-related grading, excavation, trenching and/or auguring occurs in areas that lie within the natural river levee zone (found to be generally associated with the Shanghai-Nueva-Columbia soils group). Project areas where the natural levee zones may be found include the switchyard site and portions of the 16-inch and the 4-inch natural gas pipeline routes. Using the mile posts and boundary stakes placed by the project owner, the designated cultural resource specialist shall monitor the route of the 16-inch natural gas pipeline, between Mile Post (MP) 8.97 to 9.51; MP 10.42 to MP 11.41 and MP 12.1 to 13.70. For the route of the 4-inch natural gas pipeline, areas to be monitored full time are from MP 0.00 to MP 1.60. Other sections of the linear facility routes may be monitored as deemed necessary by the CPM and Western.[41]

COMMISSION VERIFICATION PROCESS	WESTERN MONITORING
The project owner shall include, in the monthly compliance reports to the CPM, a summary of the daily logs prepared by the designated cultural resource specialist; the CPM will forward copies to Western.[42]	Western will consult with the CPM and the designated cultural resource specialist, as necessary.

[40] SPP Final EIS, Appendix O, page 24, CUL-7.
[41] Ibid., page 24, CUL-8.
[42] Ibid.

H. DISCOVERY OF HUMAN REMAINS

Description of Commission Condition of Certification: If human remains are encountered during project-related grading, excavation, auguring and/or trenching, the construction crew shall halt or redirect construction in the immediate vicinity of the find and immediately contact the county coroner and the designated cultural resource specialist. If the coroner determines that the find is of Native American origin, the coroner shall notify the Native American Heritage Commission (NAHC) to request a determination of "most likely descendant." The NAHC is required to notify the descendant(s) and request that they inspect the burial and make recommendations for treatment or disposal. If Native American remains are encountered on Federally managed land (within the Sutter National Wildlife Reserve), the FWS is required to follow the procedures of the Native American Graves Protection and Repatriation Act, to repatriate the remains.[35]

COMMISSION VERIFICATION PROCESS	WESTERN MONITORING
The designated cultural resource specialist shall notify the county coroner, the project owner, the CPM and Western if any buried human remains are encountered during project construction activities.[43]	If human remains are discovered and determined to be of Native American origin, Western will consult with the CPM and the designated cultural resource specialist for the proper disposition of the remains.

I. PRELIMINARY CULTURAL RESOURCES REPORT

Description of Commission Condition of Certification: The project owner shall ensure preparation of a preliminary cultural resources report following completion of data recovery and site mitigation work. The preliminary report is to be prepared by the designated cultural resource specialist and submitted to the CPM and Western for review and written approval. Western will provide copies of the preliminary report to the SHPO.

Protocol: The preliminary report shall include (but not be limited to) preliminary information on the survey report(s), methodology and recommendations; site records and maps; determinations of significance; data recovery and other mitigation activities; discussion of possible results and findings of any analysis to be conducted on recovered cultural resource materials and data; proposed research questions that may be answered, or that may have been raised by the data from the project-related information such as maps, diagrams, charts, photographs and other appropriate materials; and an estimate of the time needed to complete the analysis of recovered cultural resource materials and prepare a final report. As the Federal lead agency,

[43] SPP Final EIS, Appendix O, page 24, CUL-9.

Western will provide a standard report format to be followed by the designated cultural resource specialist.

If no cultural resource materials are recovered during project-related construction activities, the approved preliminary report shall also serve as the final report and shall be filed with appropriate entities.[44]

COMMISSION VERIFICATION PROCESS	WESTERN MONITORING
Within 90 days following completion of the data recovery and site mitigation work, the project owner shall submit a copy of the preliminary cultural resources report to the CPM and to Western for review, comment and written approval.[45]	Western will recommend a standard report format to be followed by the designated cultural resource specialist in preparing the preliminary cultural resources report. Western will provide the recommended format to the designated cultural resource specialist upon request and prior to report preparation. Western will review the preliminary cultural resources report (and final cultural resources report, if necessary) and provide written comment and approval or disapproval of the report.

J. FINAL CULTURAL RESOURCES REPORT

Description of Commission Condition of Certification: The project owner will ensure preparation of a final cultural resources report by the designated cultural resource specialist if cultural resource materials are found and recovered during project-related monitoring and mitigation. This final report shall be submitted to the CPM and Western for review and written approval.

Protocol: The final report shall include (but not be limited to) the survey report(s), methodology and recommendations; site records and maps; description and inventory list of recovered cultural resource materials; determinations of sensitivity and significance; summary of data recovery and other mitigation activities; results and findings of any special analyses conducted on recovered cultural resource materials and data; research questions answered or raised by the data from the project; and the name and location of the public institution receiving the recovered cultural resource materials for curation. As the lead Federal agency, Western will provide a standard report format to be followed by the designated cultural resource specialist.[46]

[44] SPP Final EIS, Appendix O, page 25, CUL-11. (A full summary of this COC was not included above.)
[45] Ibid.
[46] Ibid., page 25, CUL-12.

COMMISSION VERIFICATION PROCESS	WESTERN MONITORING
The project owner shall submit a copy of the draft final cultural resources report to the CPM and Western for review, comment, and written approval. The report shall be submitted to the CPM and Western within 90 days following completion of the analysis of the recovered cultural materials and preparation of related information. The project owner shall submit a copy of the final cultural resources report to the CPM and Western for review and written approval.[47]	Western will review the draft final cultural resources report (as well as the final report) and provide written comment, and approval or disapproval of the report.

K. CULTURAL RESOURCE RECOVERY DOCUMENTATION

Description of Commission Condition of Certification: The project owner shall ensure that Western is provided with an original (or original-quality) copy of the approved final cultural resources report, and other copies necessary to submit to the public institution receiving the recovered data and materials for curation, to the SHPO and to the appropriate regional archaeological information center(s). A legible copy of the approved final cultural resource report shall be filed with the CPM, with a request for confidentiality, if needed to protect any sensitive resources or sites.

The report copy sent to the curating institution and to the appropriate regional information centers shall include the information required by 36 CFR 79 and the regional archaeological information centers.[48]

COMMISSION VERIFICATION PROCESS	WESTERN MONITORING
The project owner shall maintain in its compliance files, copies of all documentation related to the original materials and the approved final cultural resources report with the public institution receiving the recovered data and materials for curation, with the appropriate regional archaeological information repository (ies) and the SHPO. If no cultural resource materials were recorded or recovered, then the approved preliminary cultural resources report shall serve as the final report and is to be filed with these same agencies.[49]	If cultural resources are recovered, Western will coordinate the report with the SHPO and other agencies, as appropriate.

[47] SPP Final EIS, Appendix O, page 25, CUL-12.
[48] Ibid., page 25, CUL-13.
[49] SPP Final EIS, Appendix O, page 25, CUL-13.

PALEONTOLOGICAL RESOURCES

A. DESIGNATION OF PALEONTOLOGICAL RESOURCE SPECIALIST

Description of Commission Condition of Certification: Prior to the start of project construction (defined as any construction-related vegetation clearance, ground disturbance and preparation, and site excavation activities), the project owner shall provide the CPM with the name(s) and qualifications of its designated paleontologic resources specialists and mitigation team members.

The designated paleontologic resources specialist shall be responsible for implementing all the Conditions of Certification and for using qualified personnel to assist him or her in project-related field surveys; monitoring; fossil stabilization, removal, and transport; data collection and mapping; direction and implementation of mitigation procedures; matrix sampling; screen washing and other micro-fossil recovery techniques; preparation and analysis of recovered fossils and data; identification and inventory of analysis of recovered fossils; preparation of recovered fossils for delivery and curation; and report preparation.

After CPM approval of the paleontologic resources monitoring and mitigation plan, described below in Condition PAL-4, the designated paleontologic resources specialist and team shall be available to implement the mitigation plan prior to and throughout project construction.

Protocol: The project owner shall provide the CPM with a resume or statement of qualifications for its designated paleontologic resources specialist and mitigation team members. The resume(s) shall include the following information:

1) The resume for the designated paleontologic resource specialist shall demonstrate the specialist meets the following minimum qualifications: a graduate degree in paleontology or geology or paleontologic resource management; at least three years of paleontologic resource mitigation and field experience in California, including at least one year's experience leading paleontologic resource field surveys; leading site mapping and data recording; marshalling and using of equipment necessary for fossil recovery, sampling, and screen washing; leading fossil recovery operations; preparing recovered materials for analysis and identification; recognizing the need for appropriate sampling and/or testing in the field and in the lab; directing the analyses of mapped and recovered fossil materials; completing the identification and inventory of recovered fossil materials; and the preparation of appropriate reports to be filed with the receiving curation repository, the University Museum of Paleontology at Berkeley, all appropriate regional information center(s) and the Commission.
2) The resume for the designated paleontologic resource specialist shall include a list of specific projects the specialist has previously worked on; the role and responsibilities of the specialist for each project listed; and the names and phone numbers of contacts familiar with the specialist's work on these referenced projects.

3) If additional personnel will be assisting the designated paleontologic resources specialist in project-related field surveys, monitoring, data and fossil recovery, mapping, mitigation, fossil analysis or report preparation, the project owner shall also provide names, addresses and resumes for these paleontology resource team members.

4) If the CPM determines the qualifications of the proposed paleontologic resources specialist do not meet the above requirements, the project owner shall submit another individual's name and qualifications for consideration.

If the previously approved designated paleontologic resources specialist is replaced prior to completion of project mitigation, the project owner shall obtain CPM approval of the new designated paleontologic resources specialist by submitting the name and qualifications of the proposed replacement to the CPM, at least 10 days prior to the termination or release of the preceding designated paleontologic resources specialist.[50]

COMMISSION VERIFICATION PROCESS	WESTERN MONITORING
At least 90 days prior to the start of construction on the project, the project owner shall submit the names and resume for its designated paleontologic resources specialist to the CPM for review and approval. The CPM shall provide written approval or disapproval of the proposed paleontologic resources specialist. Thirty days prior to the start of the construction, the project owner shall confirm in writing to the CPM that the previously approved, designated paleontologic resources specialist and the team of assistants are prepared to implement the monitoring and mitigation measures for paleontologic resources, as described in the CPM-approved paleontologic resources monitoring and mitigation plan, prepared per Condition PAL-4 below. At least 10 days prior to the termination or release of a designated paleontologic resource specialist, the project owner shall obtain CPM approval of the new designated paleontologic resource specialist by submitting to the CPM the name and resume of the proposed replacement specialist.[51]	Calpine will provide Western with the qualifications of the paleontological resource specialist and the CPM approval.

[50] SPP Final EIS, Appendix O, page 26, PAL-1.
[51] Ibid.

B. PALEONTOLOGICAL RESOURCES TRAINING PROGRAM

Description of Commission Condition of Certification: Prior to the start of construction on the project, the designated paleontologic resources specialist shall prepare an employee training program. The designated paleontologic resource specialist shall submit the training program to the CPM for approval.

Protocol: The training program will discuss the potential for encountering fossil resources, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources.

The training shall also include the set of reporting procedures that workers will follow if sensitive paleontologic resources are encountered during project activities. The training program will be presented by the designated paleontologic resources specialist and may be combined with other training programs prepared for cultural and biological resources, hazardous materials or any other areas of interest or concern.[52]

COMMISSION VERIFICATION PROCESS	WESTERN MONITORING
At least 30 days prior to the start of construction, the project owner shall submit to the CPM for review, comment and written approval, the proposed employee training program and set of reporting procedures the workers are to follow if paleontologic resources are encountered during project construction. The CPM shall provide the project owner with written approval or disapproval of the employee-training program and the set of procedures within 15 days of receipt of the submittal. If the draft-training program is not approved, the project owner, the designated paleontologic resources specialist and the CPM shall meet to discuss the comments and work out necessary changes.[53]	Calpine will provide Western with a copy of the CPM-approved paleontology training program prior to implementation.

C. FINAL PALEONTOLOGICAL RESOURCES REPORT

Description of Commission Condition of Certification: The project owner shall ensure preparation of a final paleontologic resources report by the designated paleontologic resources specialist if significant fossil resources are found and recovered during project-related surveys, monitoring and mitigation.

[52] SPP Final EIS, Appendix O, page 28, PAL-5.
[53] Ibid.

Protocol: The final report shall include (but not be limited to) the survey report(s), methodology and recommendations; locality records and maps; description and inventory list of recovered fossil materials; determinations of sensitivity and significance; summary of data recovery and other mitigation activities; results and findings of any special analyses conducted on recovered paleontologic resource materials and data; research questions answered or raised by the data form the project; and the name and location of the public institution receiving the recovered paleontologic resources for curation.[54]

COMMISSION VERIFICATION PROCESS	WESTERN MONITORING
The project owner shall submit a copy of the draft final paleontologic resources report to the CPM for review, comment and written approval. The draft final paleontologic resources report shall be submitted to the CPM within 90 days after completing analysis of the recovered fossil materials and preparing text and related information, such as maps, diagrams, tables, charts, photos, etc.[55]	Calpine shall provide Western with a copy of the final paleontological resources report.

FACILITY DESIGN

A. DESIGNATED RESIDENT ENGINEER AND OTHER KEY PERSONNEL

Description of Commission Condition of Certification: Prior to the start of site preparation, the project owner shall assign a California registered architect, structural engineer or civil engineer, as a resident engineer (RE), to be in general responsible charge of the project. [Building Standards Administrative Code (part 1, title 24, C.C.R.), Section 4-209 – Designation of Responsibilities.]

The RE may delegate responsibility for portions of the project to other registered engineers. Registered mechanical and electrical engineers may be delegated responsibility for mechanical and electrical portions of the project, respectively. A project may be divided into parts, provided each part is clearly defined as a distinct unit. Separate assignment of general responsible charge may be made for each designated part.

Protocol: The RE shall:

1) Monitor construction progress to ensure compliance with the design intent;

[54] Ibid., page 30, PAL-11.
[55] Ibid.

2) Ensure construction of all the facilities conforms, in every material respect, to the applicable laws, ordinances, regulations and standards (LORS), approved plans and specifications;

3) Prepare documents to initiate changes in approved drawings and specifications when directed by the project owner or as required by conditions on the project;

4) Be responsible for providing the project inspectors and testing agency(ies) with complete and up-to-date set(s) of stamped drawings, plans, specifications and other required documents;

5) Be responsible for the timely submittal of construction progress reports to the chief building official (CBO) from the project inspectors, the contractor and other engineers who have been delegated responsibility for portions of the project; and

6) Be responsible for notifying the CBO of corrective action or the disposition of items noted on laboratory reports or other tests as not conforming to the approved plans and specifications.

The RE shall have the authority to halt construction and to require changes or remedial work if the work does not conform to applicable requirements. FACILITY DESIGN 516 October 19, 1998.

If the RE or the delegated engineers are reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO approval of the new engineer.[56]

COMMISSION VERIFICATION PROCESS	WESTERN MONITORING
At least 30 days (or a lesser number mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the name, qualifications and registration number of the RE and any other delegated engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the RE and other delegated engineer(s) within five days of the approval. If the RE or the delegated engineer(s) are subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.[57]	Calpine shall provide Western with the qualifications of the designated resident engineer and any other key personnel, as requested by Western.

[56] SPP Final EIS, Appendix O, page 32, GEN-4.
[57] Ibid.

Appendix B—FWS Standard Avoidance and Minimization Measures During Construction Activities in Giant Garter Snake Habitat

(to be inserted)