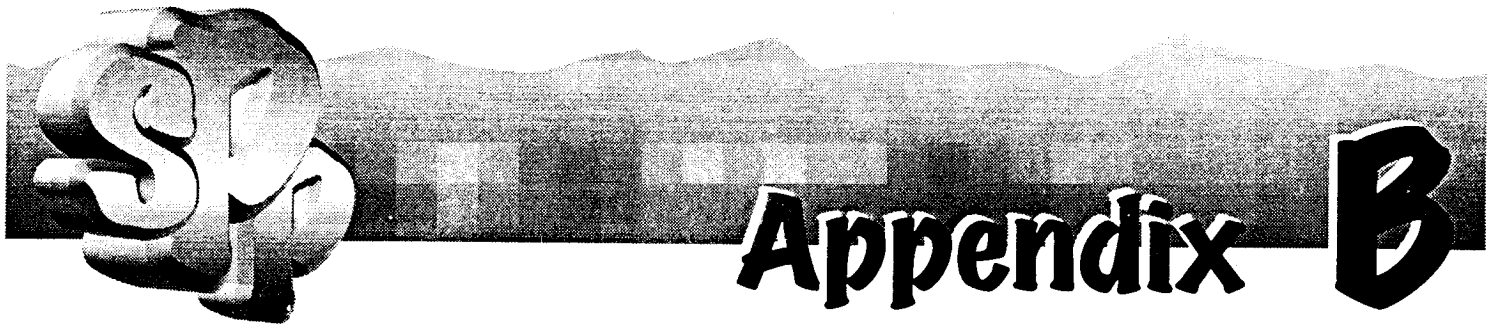
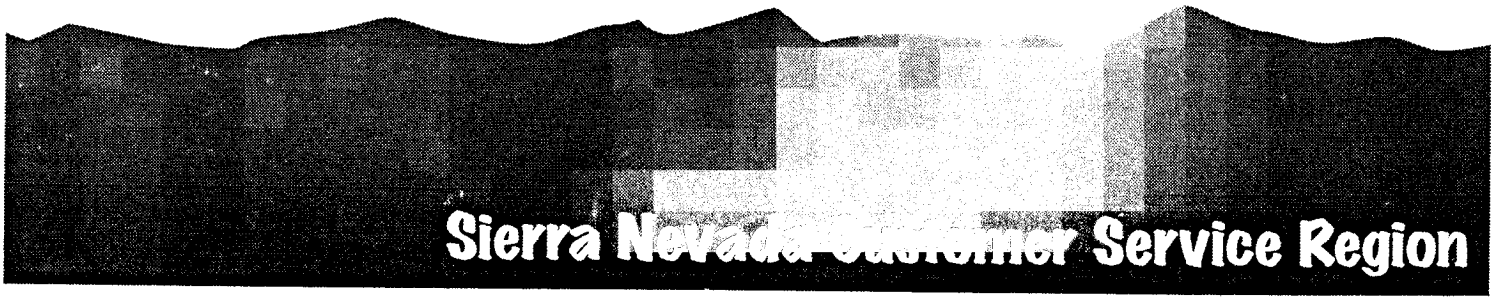


Appendix B

Department of the Army
Clean Water Act Section 404
Individual Permit for Filling Wetlands
on the Proposed Sutter Power Plant Project Site
(ID#199700183); Dated Sept.30, 1998



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

Public reporting burden for this collection of information is estimated to average 5 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Service Directorate of Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the office of Management and Budget, Paperwork Reduction Project (0710-0003), Washington DC 20503. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

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: 1160 N. Dutton, Suite 200 Santa Rosa, CA. 95401	9. AGENT'S ADDRESS
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.

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
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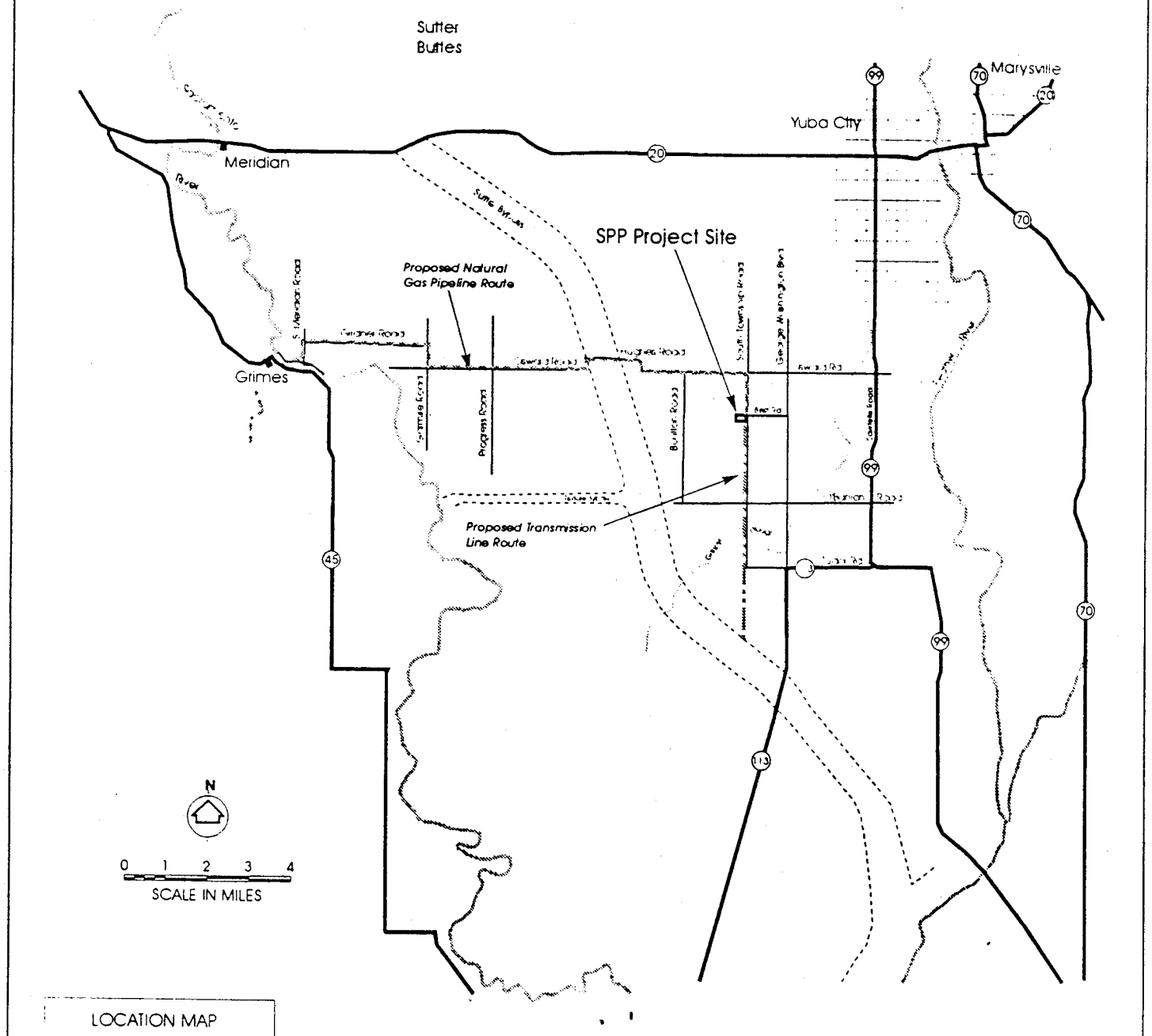
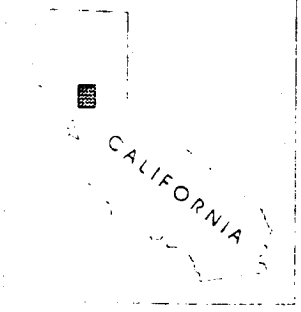
California Energy Commission	Certification of Power Plant	-	December 15, 1997	In progress	-
U.S. Fish and Wildlife Service	Biological Opinion from Endangered Species Act Section 7 Consultations	1-1-98-I-1390	June 8, 1998	In progress	-
California Department of Fish and Game	Streambed Alteration Agreement	-	In progress	In progress	
California Department of Fish and Game	Memorandum of Understanding for California Endangered Species Act consultations	-	In progress	In progress	-

ATTACHMENT B

PROPOSED SUTTER POWER PLANT LOCATION MAP



LOCATION MAP



LEGEND

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

ATTACHMENT B

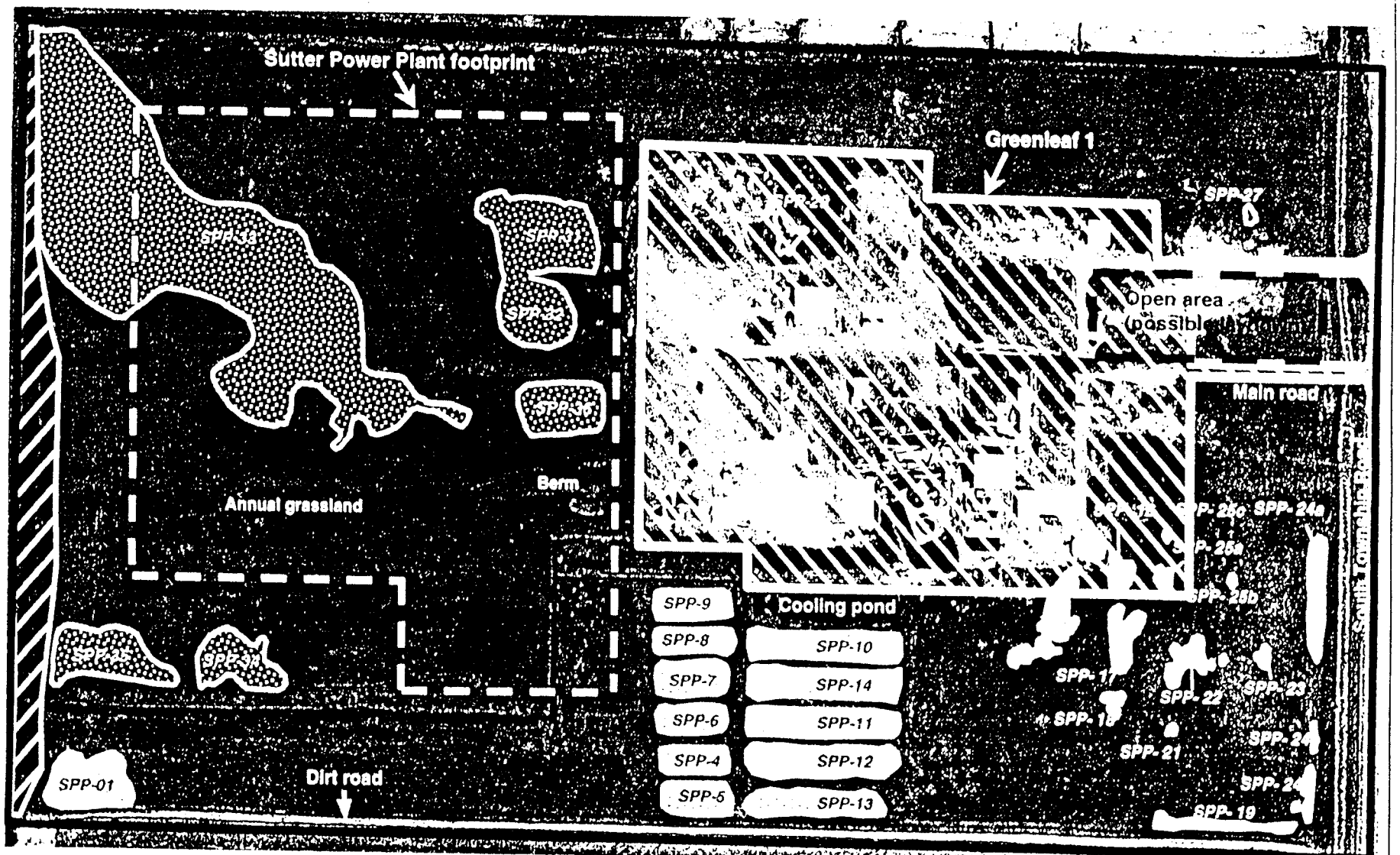
SUTTER POWER PLANT PROJECT

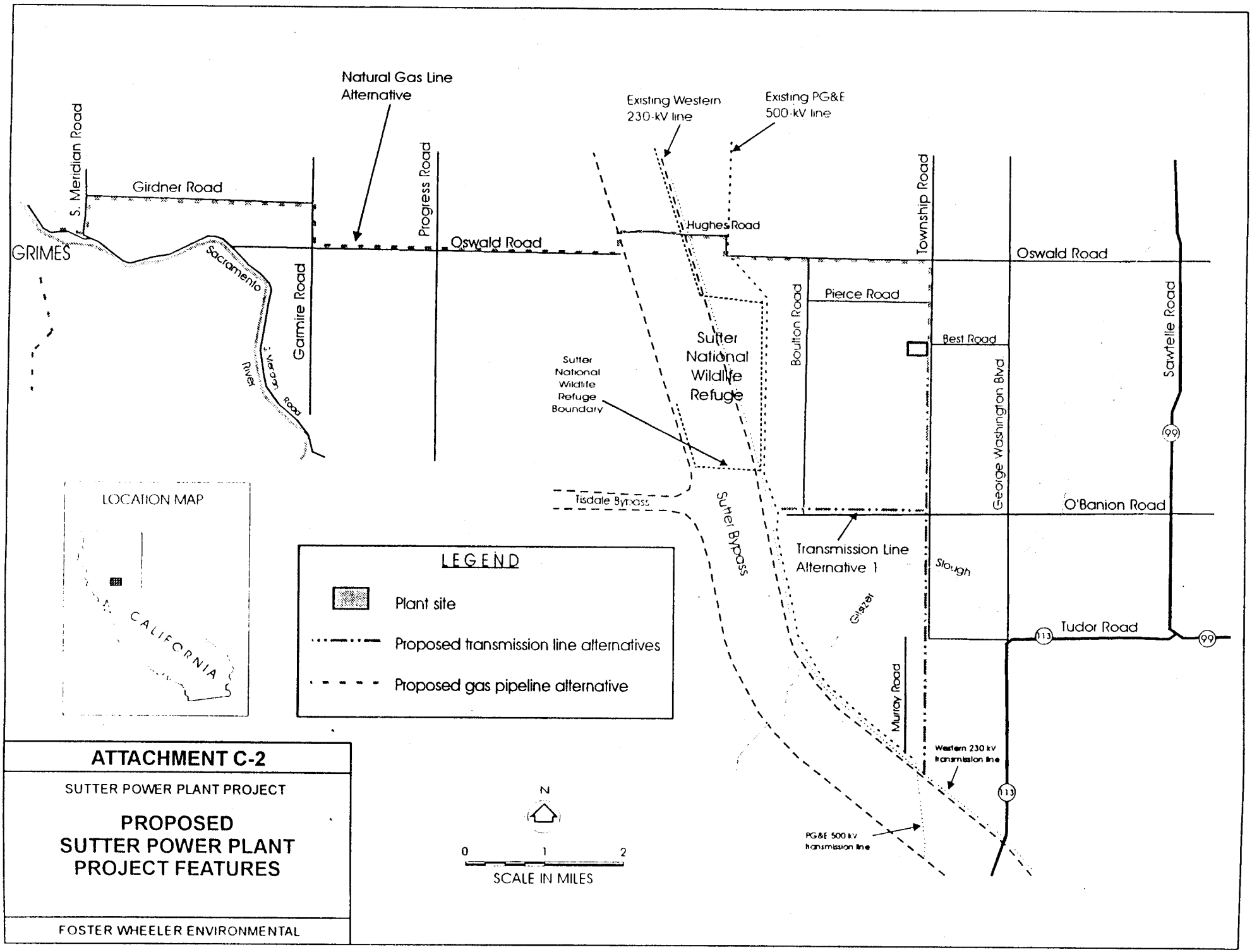
PROPOSED SUTTER POWER PLANT LOCATION MAP

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-26
SPP-01
Dirt road
SPP-24a
SPP-24b
SPP-24c
SPP-17
SPP-18
SPP-22
SPP-23
SPP-21
SPP-24
SPP-19
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).

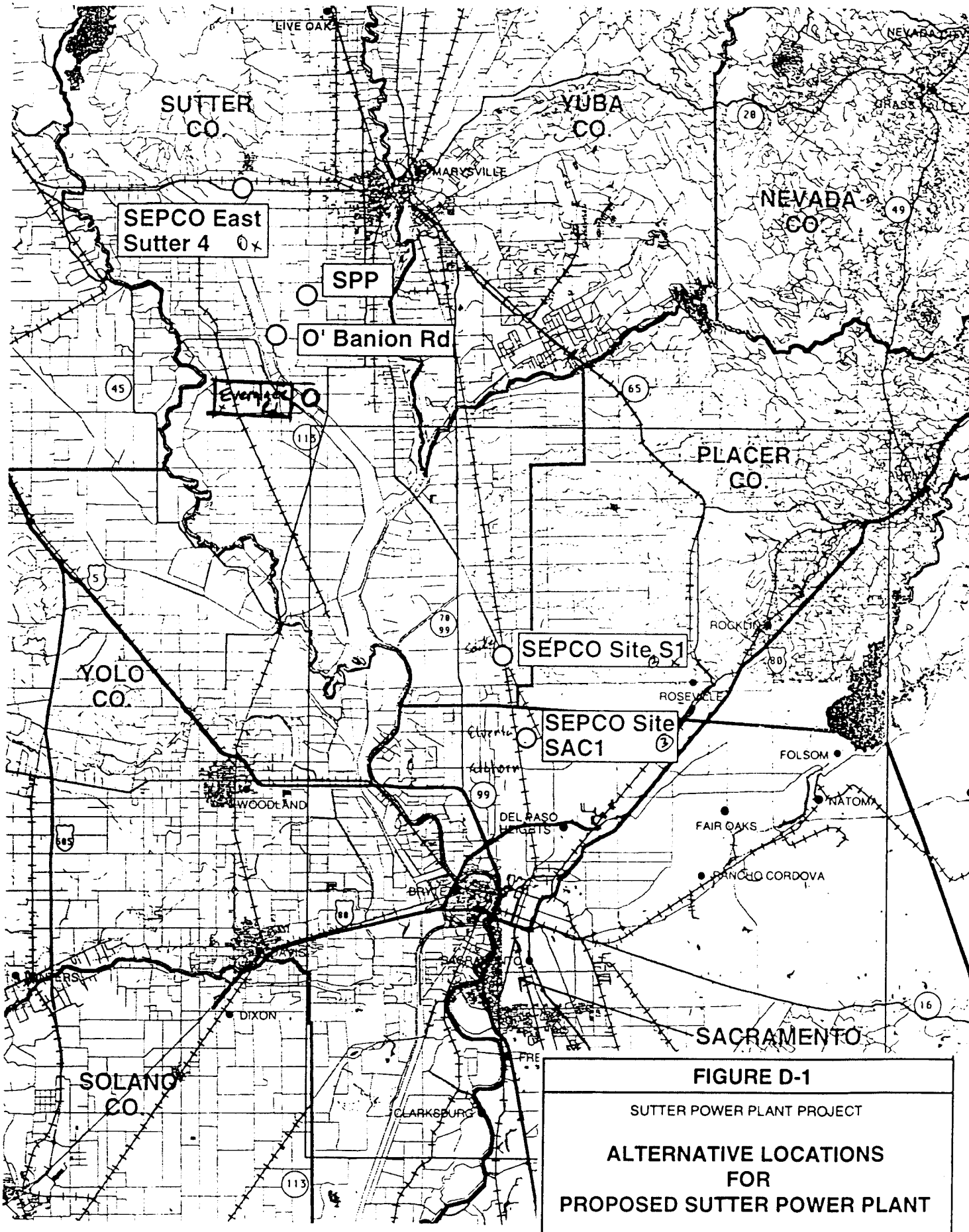


FIGURE D-1

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: